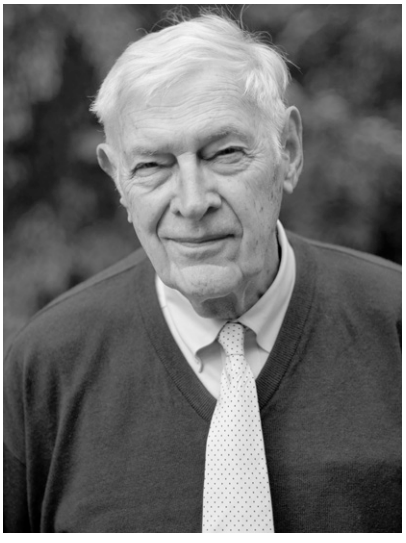
AAPG Honorees, 2016



PAUL E. POTTER
Sidney Powers Award

Citation—To Dr. Paul Edwin Potter, scientist, author, educator, mentor, and one of the foremost sedimentary geologists of our time: In recognition of outstanding contributions to the advancement of knowledge on the sedimentology and petrography of sandstones, shales, and limestones, to our understanding of the geology of the American eastern Midwest, and to Mesozoic and Cenozoic geology in South America.

Born in Springfield, Ohio, Paul Edwin Potter was raised and schooled in that state. Following service in the US Army during World War II, Paul studied at the University of Chicago, where he earned a Bachelor of Philosophy degree, and subsequently both his master's and doctoral degrees in geology.

In 1952, Potter started his professional career at the Illinois State Geological Survey (ISGS) first in glacial geology, but he quickly moved to its Coal Section, where he worked in coal resources and mapped coal beds and their associated channel fills and established their clastic systems. He also mapped Chesterian rocks in subsurface basinwide paleoriver systems. On a larger scale, Paul marshalled sandstone petrography and paleocurrent systems for much of the Paleozoic section of the eastern Midwest and Kentucky. During his 9 years at the ISGS, he also worked with neighboring state geological surveys and obtained a second M.S. degree.

Paul received a Guggenheim Fellowship in 1961, and he moved to The Johns Hopkins University, where he collaborated with Francis J. Pettijohn on two books, *Paleocurrents and Basin Analysis* (Potter and Pettijohn, 1963) and *Atlas and Glossary of Sedimentary Structures* (Pettijohn and Potter, 1964). These books proved to be widely used in both industry and classrooms. Examining the Paleozoic clastics of the Illinois Basin in the era when "the present is the key to the past" took on new meaning.

Paul became interested in the clay mineral composition of modern muds in the streams of the Mississippi River Basin. Some of this was summarized in *Sand and Sandstone* with Francis Pettijohn and Raymond Siever (1972; second edition, 1987; later translated into Russian and Chinese). Years later, Paul collected a series of over 600 modern sands across South America, and related their sand composition to plate tectonics and climate—still the only example of a continent-wide petrology study of modern sands.

In 1963, Paul joined Indiana University as an associate professor of geology, and in 1966, he was promoted to professor of geology. At Indiana, he widened his research experience beyond clastic sediments by co-authoring with Alan S. Horowitz *The Introductory Petrography of Fossils* (1971). He also consulted for Total in Paris on reservoir geology and with a field trip to the Sahara desert—a totally new challenge.

Beginning in 1971 and for the next 19 years, Potter served as professor of geology at the University of Cincinnati. Since then, he has actively participated in department matters as professor emeritus, offering courses, conducting research, mentoring students, and continuing to publish his findings. Collaborating closely with Cincinnati colleagues, J. Barry Maynard and Wayne A. Pryor,

they published *Sedimentology of Shale* in 1980. Subsequent to that, and with Maynard and P. J. Depetris, they published the sequel *Mud and Mudstone* in 2005. From 1976 through 1979, Paul, Wayne Pryor, and Barry Maynard had a Department of Energy grant to study the Devonian-Mississippian black shales of the Appalachian basin. This led to 15 papers, 8 theses, and an early book on shales.

After he retired from the department in 1992, Paul once again expanded his geological perspectives, acquiring elementary Portuguese and teaching geology for 7 years in Brazil. Still returning there annually, he continues to learn much about Gondwana geology and sharing that new knowledge with students. Working in Brazil and elsewhere in Latin America led to 18 coauthored papers. His most recent publication in 2015 with Peter Szatmari (Petrobras) examines the geologic impact of middle and late Miocene orogeny.

Paul is one who feels strongly about giving back to society by sharing his expertise to the benefit of the local community. In his own neighborhood, he published a hundred-page report on the *Geology of the Greater Cincinnati/Northern Kentucky Region* (1996 and 2007). This urban geology text is notable in its overview of the North American craton, and an interpretation of the geology and geophysics under Cincinnati, and their effect on the local landscape. Additionally, Paul was the individual who recently brought together the three state geological surveys of Indiana, Kentucky, and Ohio, and the Department of Geology at the University of Cincinnati, to write a highly illustrated brochure *Landslides and Your Property*, for the greater Cincinnati area. This important guide is essential reading for the interested lay reader who needs to know how the geology of the area affects slope stability, infrastructure, and, ultimately, land values.

During his seven-decade career, Paul has always had close contacts with the state geological surveys of Illinois, Indiana, Kentucky, and Ohio, and has published with them. Many of these efforts were outgrowths of dozens of student research projects that he oversaw during his tenure at Cincinnati. His contributions to Midwestern professional geological societies and to state geological surveys have been recognized as outstanding and meritorious, earning for him the Life Achievement Award in Indiana, the Distinguished Lecturer and Valued Contributor Awards in Kentucky, and the Mather Medal in Ohio.

Paul's many contacts with the petroleum industry are through the AAPG. He attends both the annual national meeting of the Eastern Section and some international meetings. While he has done some consulting with petroleum companies, for the most part, he has benefited them by mostly training personnel through one-on-one contact. In 2007, Paul was awarded the John T. Galey Award, the Eastern Section of AAPG's highest honor for outstanding accomplishments and contributions to our profession.

Very few geologists have made the diverse, fundamental contributions to knowledge that Paul has. His career has shown great balance between field observations, laboratory analyses, and scholarship that have led to practical applications in the petroleum industry. His research and textbooks are classics for their intellectual resources and concepts in clastics and fluvial deposition. For all who have met Paul Potter, they know him as a dear colleague, a wonderful gentleman, and one who has been a steady influence on their careers. How rare and wonderful for all of us. I can think of no one in our profession of petroleum geologists who epitomizes the intent of the Sidney Powers Memorial Award and who deserves this recognition of high honor more than Paul Potter.

John C. Steinmetz

Response

I have been blessed by all the help I have had from my earliest years to this very day here in Calgary. This help only became apparent to me long afterward.

In my first 9 years, I was a middle-class city boy, but in 1935 my parents bought a farm and I became its go-fetch-it boy. I attended a two-room school, where fifth through eighth

grades were taught by a no-nonsense teacher who exercised total discipline. In this school, you learned as you recited, but also as the others recited. The schoolhouse lacked plumbing (two outhouses), had a cow pasture for a playground, no educational equipment, and no supplemental programs. In spite of this, we received a fine education. This shows how much one can learn without supplementary equipment and programs. High school was in the next county with a class of 27.

I entered the US Army in January 1944, and for the first time had to live and work closely with people from different backgrounds from different parts of the country. The great lesson for me was how well such a group can work together for a common cause. Three and a half years of government support from the GI Bill was another important benefit.

After World War II at the University of Chicago, I discovered the great books and learned how to critically read an article. In the early postwar years, Chicago was alive with physicists and chemists, and isotope geology was just coming about. Harold Urey was there, as were Willard Libby, Heinz Lowenstam, and others. Although I did not follow their path, I saw how important it is to look beyond geology for help and ideas.

Nine years at the Illinois State Geological Survey in Champaign-Urbana followed—Pleistocene geology, coal resources, plenty of core logging and subsurface mapping, sandstone petrology, regional and local paleocurrent studies, and sand body geometry, especially cutouts of coal beds. The value of closely relating outcrop sections to the nearest subsurface was drilled into me. Add to this working with the public, with neighboring state geological surveys, and learning how to write better from survey editors. These years were the very best "post doc" I can possibly imagine. Another benefit was the support the Illinois Survey always gave for professional development—do your assigned work and we will support complementary research or related training. The Survey was located on the University of Illinois campus, so it was easy to acquire a second M.S. degree in statistics. At a Saturday hiking club, I also met many mathematicians, physicists, and engineers and learned much listening to them around campfires along the nearby forested, low-gradient prairie streams.

I was fortunate to receive a Guggenheim Fellowship to The Johns Hopkins University starting in fall 1961 and help Francis Pettijohn write two books, *Paleocurrents and Basin Analysis* plus *Atlas and Glossary of Sedimentary Structures*. Two books in 2 years further developed both my organizational skills and the necessity of having clear objectives from the very beginning. At Hopkins I also met many geologic visitors of note and learned how much I could gain from new faces and a new geologic setting.

At age 36, I joined the geology department of Indiana University, where I taught my first classes, discovered faculty meetings, first worked with carbonate rocks, deepened my insights into cratonic geology, and helped Professors Pettijohn and Siever write *Sand and Sandstone* and Alan Horowitz produce *The Introductory Petrography of Fossils*. I also did some work in Paris for Total, working on the reservoir geology of the Hassi Messaoud oilfield of Algeria in the Sahara and visited its outcrop near the Niger frontier—a wonderful exposure to a big desert. This project also showed me the importance and joys of speaking a foreign language, even at an elementary level. These experiences were big steps forward for a Midwesterner.

In 1971, at the age of 46, I moved to Cincinnati to help Wayne Pryor with his sedimentology program, and 3 years later we were joined by Barry Maynard, who added a chemical component. Our collective skills were the right combination for the right time and were greatly enhanced by a $465,000 grant from the Department of Energy–U.S. Geological (1976–1980) to help a consortium study the Devonian-Mississippian black shales of the Appalachian Basin. This was the largest grant ever for the geology department and led

to 15 papers, 8 theses, and a book on shales. Many of our students achieved notable success in the petroleum industry.

Also at Cincinnati I worked with Elena Franzinelli to study the petrology of the modern sands of South America to evaluate tectonic versus climate controls; with Kenneth Hamblin on the origin of big rivers worldwide; and prepared the first report on the geology of the Greater Cincinnati area since 1916. I was motivated to learn local geology by a remark a professor at Chicago said long before: "Paul, every geologist should do something for his community!" I found this effort most satisfying because it connected me to the local geologic community, was useful in teaching local geology, and showed me the great role that geology plays in modern life. I also helped Wayne Pryor start the Fisk Laboratory of Sedimentology and raise money for its students. Subsequently, I cofounded a lecture fund, a map fund, and an international travel fund. I found supporting activities that help geology students to be most satisfying.

In 1974 I was asked to come to Brazil to teach a short course in sandstone petrology, and this led to short training courses for Petrobras, the state oil company. These trips improved my Portuguese and widened my network of contacts in Brazil. After I retired from UC in 1992, I taught at the State University of Sao Paulo and the Federal University of Rio Grande do Sul. I also helped professors and graduate students at both schools write English-language research papers. The last year, I helped with 27 abstracts and 32 papers. In Rio Grande do Sul I discovered U/Pb dating of detrital zircon in sandstones and its great role in tectonic reconstructions and stratigraphy and helped John Orestes prepare three zircon chronology papers.

Spending these 7 years in Brazil greatly prolonged my active professional life. Geologically, I was exposed to Gondwana, to South Atlantic geology, the classic escarpments of passive margins, high interior plateaus, the Parana Basin—1,000 km in diameter—and the Amazon Basin. I also witnessed 2,000% inflation and saw Brazil transition from dictatorship to democracy. With only an elementary grasp of Portuguese, I had to distill my thoughts into their most simple form—a skill that benefitted both the students and me. This was an incredible experience that greatly enriched my life in many ways, won me many friends, permitted me to travel widely in Brazil, and discover how warm and outgoing Brazilians are. Looking back, I ask myself, "What does it show? What can be said of it? Was there a pattern to it all?" The overriding pattern is that every 8 to 10 years my focus has changed. This reflects my realization that I have either accomplished about all I can or that my interest is flagging. About midway in my professional life, I realized this pattern and decided to continue with it in spite of big risks: I might fail to master the new field; I might master it and submit a paper, but have it rejected by reviewers (because I'm not "a member of the club"); and once one leaves a path, it is difficult to return to the earlier one. So changing paths midway or late in professional life and failing can end a productive career. But switching focus also has some great benefits: it will almost certainly be more interesting, it will also be more challenging and, perhaps most important, it can prolong your skills as you age. Best of all, this new research will open new windows to your mind.

I am here today not because of what I did, but because of all the help I have received, starting from my earliest years. This includes many different institutions and people. Supportive parents, 4 years in a two-room school, the US Army and the GI Bill, the University of Chicago, 9 years at the Illinois State Geological Survey, a year at Johns Hopkins, teaching at five universities (initially at Indiana University), working in Paris and Rio de Janeiro, and working and publishing with Midwestern state geological surveys. And among these the University of Cincinnati deserves special mention. To all these let's add joining the AAPG late in life. I always liked their national meetings, because of the opportunity to meet members of the petroleum industry and to use these talks and lectures to enhance my courses. At the Eastern Section, especially,

I made many friends outside of the academic sphere, many of whom brought me here today. To everyone, my deepest appreciation and especially to James McDonald. Thank you so much!

Paul Edwin Potter

SCOTT W. TINKER
Michel T. Halbouty Outstanding Leadership Award

Citation—To Dr. Scott W. Tinker, a rare talent who combines an in-depth understanding of geoscience and energy with societal awareness, integrity, vision, and a strong work ethic to motivate those around him through compelling and relevant leadership. Tinker's ability to bring government, industry, and academe together to address major global issues is his greatest leadership—and societal—contribution.

Honoring Scott W. Tinker with the 2016 Michel T. Halbouty Outstanding Leadership Award for exceptional leadership in the petroleum geosciences is fitting recognition for an individual who has shown true leadership throughout his professional career. Some realize their potential once they reach a leadership position, becoming skilled managers without ever having contributed significantly to the technical mission. This is not the case for Tinker, who has been a noteworthy contributor at all levels of our profession: as a field geologist mapping outcrops in Mexico and the Guadalupe Mountains of Texas (leading to an award-winning publication); as a subsurface 3-D-modeling visionary at Marathon's Littleton lab, providing new directions in subsurface modeling; as director of the largest and arguably the best-known state geologic research organization in the United States; as president of AAPG, AASG, AGI, and GCAGS; and continuing today as a focal point for a path forward in the global energy debate.

In the words of John Maxwell, "A leader is one who knows the way, goes the way, and shows the way." In this sense, through his state-of-the-art research, his energetic pursuit of knowledge regarding the future of energy, and his willingness to engage people—whether his staff at the Bureau of Economic Geology (BEG), a congressional subcommittee, or a global audience watching his film *Switch*—Tinker has the knowledge, energy, and vision that exemplify a true leader in our profession.

Tinker's distinguished career has witnessed extraordinary achievements and dedicated service to our science, profession, and society. Academically, Tinker excelled in earth science at Trinity University under Professor Ed Roy, where he was a Phi Beta Kappa member and graduated magna cum laude with a double major in geosciences and business. After working the East Texas Basin for Powers Medalist Robert M. Sneider in 1982–83, he attended the University of Michigan and received his M.Sc. under Powers Medalist James Lee Wilson, working on the Cretaceous of northern Mexico. When I spoke to Scott, he commented, "I have been extremely fortunate to have had great mentors. From my dad, a geologist with Shell for 39 years, to Ed Roy, Bob Sneider, James Lee Wilson, and on and on. Too many to name. Having such mentors has been the highlight of my life."

Scott and his wife of 33 years, Allyson, left Michigan in 1985 to join Champlin Petroleum (later Union Pacific Resources) in Denver, where he worked the Devonian of Western Canada with David Eby and Kent Kirkby. When Union Pacific consolidated operations in Fort Worth in 1988, Tinker landed a job at Marathon's lab in Denver, quickly advancing to lead a cutting-edge effort in integrated 3-D modeling and reservoir characterization. Dissecting world-class fields like Yates and Indian Basin, Tinker's group pushed the envelope of high-end computing, all the

while keeping the models "grounded" in the rocks.

Scott pioneered integrated stratigraphy and modeling of the Permian Capitan system in McKittrick Canyon for his Ph.D. research at the University of Colorado, which brought his first major award: a best paper in the *Journal of Sedimentary Research*. This achievement was made the more remarkable considering that Scott was simultaneously holding down a full-time job at Marathon and starting a family with Allyson.

Scott and I began a professional partnership and lasting friendship around this time, teaching AAPG and SEPM short courses, leading field trips, and writing papers together. Scott inspired *everyone* he worked with, and though he did not hold a title of "manager" in those industry days, there was no doubt that Scott was a driving force of the research vision. His inspiration pushed the group to integrate geology, petrophysics, and geophysics in a way that helped reshape the industry's concept of the subsurface.

True to the energy that still drives him, Tinker, after 17 years in the industry, sought new challenges and horizons, making a bold jump to the position of director at The University of Texas at Austin's Bureau of Economic Geology, which was then a fewer-than-100-person research organization. Tinker seamlessly (at least to the casual observer) transitioned from working in an industrial research lab, to being an academic leader. With the necessary combination of management skills and science pedigree required to garner respect from the Ph.D. research staff, Scott quickly established himself as more than *just* a director. In an emotional meeting following the 9/11 attacks, which occurred not long after he had joined the BEG, Scott gathered his team to serve as a sounding board for the highly diverse staff's thoughts and uncertainties. Being open to and hearing out the personal and professional concerns of the group speaks volumes. This is the signature of a leader, not just a manager.

Tinker has led the Bureau of Economic Geology with integrity, a strong work ethic, excellent management skills, and bold vision. He has kept Bureau core strengths at the forefront while growing the organization in new directions, including the development of a $50 million partnership with industry and international universities on advanced micro- and nano-subsurface sensors; a carbon management program recognized both nationally and internationally; a center for energy economics; and a major program in mudrocks from pore scale to future production scale. From 2000, when Tinker became director, to the present, the Bureau has grown from annual external funding of $10 million to $35 million, and from under 100 to 250 staff. Some leaders come to a place for a few years, make the obvious and easy changes, and move on. Scott, however, has stayed with the Bureau through thick and thin. As he says, "I get to live with the messes I have made!"

Tinker's passion is bringing academe, government, industry, and NGO's together into what he calls the "radical middle" to address major societal issues in energy, the environment, and the economy. William Fisher, past president of the AAPG and former director of the BEG, has on more than one occasion emphasized to Scott the importance of a national/international leadership role for the Bureau director in order to reach the largest audience possible. Tinker took Fisher's challenge to heart, becoming president of the American Association of State Geologists in 2006 and president of AAPG in 2008, and president of AGI in 2016. According to Fisher, "Tinker has become perhaps the most prominent spokesman in the science and policy of energy resources today. He is one of the most articulate speakers and cogent thinkers in the area of energy geosciences that I have ever known. And he has probably reached more people than any geologist in history."

As the youngest-ever president of AAPG, Tinker challenged the organization to take an active role in leading the energy industry and helped to position AAPG into a respected option for decision makers seeking objective input and useful solutions to major energy challenges. AAPG is now a first stop for groups and individuals who want straight talk on energy

matters. Tinker also had a powerful role in demonstrating the importance of natural gas and coined the term "bridge" in 2008 when considering the transition from petroleum to future power sources. Tinker's outreach with trips to Russia, Western and Eastern Europe, China, Singapore, Australia, Thailand, South Africa, and Brazil also enhanced AAPG's international presence. In addition, Scott formed the AAPG President's Council, which gathers presidents of all regions, sections and divisions of the organization to facilitate communication and encourage a more unified global message. His presidential address at the annual meeting in Denver in 2009—where he brought the role of education into his energy, economy, and environment message—brought the audience of 1,500 to its feet. After Scott's year as president, former AAPG president Marlan Downey said, "Tinker was a great AAPG president. There have been many good; damn few great."

What drives the desire to lead, and to what end? What are the underpinning ambitions of outstanding leaders? And what makes a leader successful? For Tinker, successful leadership includes the daunting but critical task of raising the level of the scientific role in the national and international debate on the future of the world's energy resources. Many of us professional geoscientists rue the lack of scientific understanding portrayed in the news. Tinker, however, is taking the debate head on. A gifted and energetic communicator, he has used the full spectrum of tools provided by our Information Age to make his case. His critically acclaimed film *Switch*, with its mix of on-the-ground footage and fog-cutting analogies of scale, has surpassed 10 million viewers, a reach exceeding what many geoscientists considered possible for science information. Congressional committees, op-ed pieces, interviews with the press, testimonies to congressional subcommittees, serving on boards for the National Research Council as well as on director and advisory boards for national and international companies—all have put Tinker in extremely high demand as a knowledgeable and influential spokesperson for, and leader in, our profession.

Recognition of Scott W. Tinker with the 2016 Michel T. Halbouty Outstanding Leadership Award is a just and timely honor for a leader, a scientist, and a family man who continues to provide the will and the skill to move our profession forward.

Thanks, Scott!

Charles (Charlie) Kerans

Response

I recall the first time I saw Mike Halbouty. The year was 1977; I was a senior in high school. My family and I were having dinner at Vargo's in Houston. Dad said to us, as he looked across the restaurant, "That's Mike Halbouty," and went on to describe the man whose career has impacted so many.

To receive AAPG's Michel T. Halbouty Outstanding Leadership Award is the greatest honor of my career.

On occasion, I am asked, "What kind of leader are you?" I am not sure leadership can be neatly packaged, although many have tried. Perhaps an anecdote or two might address the question.

In the spring of 2000, my family was still living in Denver, and I was in Austin trying to get my arms around the job at the Bureau of Economic Geology. Days were long, nights were short, and weekends served as uninterrupted periods…for more work! It was one of the most invigorating times of my life.

That spring, my close friend Charlie Kerans—whom I am indebted to for many things, not the least of which is his thoughtful citation for this award—and I had agreed to lead a West Texas Geological Society trip to the Guadalupe Mountains. I was still in the delusional phase of believing I could remain both an active carbonate geologist and a director. The trip included a daylong trek in McKittrick Canyon, where we would trace a high-frequency sequence from the shelf crest across the reef into the basin. A long hike, to be sure. My second son, Derek, who was 9 years old at the time, had flown alone from Denver to Carlsbad to join the group. Midday, we were hiking on the Wilderness Ridge trail, somewhere in the middle of a pack of 100 or so geologists, when Derek said plainly, "Dad, aren't you the leader of this trip?"

"Yes," I said. "Why?"

With a puzzled look on his face, he followed up, "Then why aren't we in front?"

"Well," I said, knowing this was one of *those* moments and scrambling for an answer, "sometimes it is best to lead from the middle…"

Derek thought about that, smiled, and marched on, satisfied with the father–son secret that a leader is part of the team and can lead from within. Derek is now 24 and wrapping up an M.S. in petroleum engineering at UT Austin. Derek has been taking on leadership roles for many years now.

Another story involves my oldest son, Nathan. When Nate was in high school, he decided it would be a good idea to detach the garage door from the electric door opener so that it could be lifted quietly for a middle-of-the-night exit and stealthy reentrance. When Nate returned around 3 a.m., I was sitting in the darkened den as he tiptoed in his stocking feet toward the stairs.

"What's up?" I asked, sending Nate into simultaneous cardiac arrest and a severe state of disbelief.

"Dad, you scared the crap out of me! How did you know I was gone?"

Although I affected an "all-knowing and all-seeing" air, the truth is, that night I just woke up and looked in the garage for no particular reason. Lucky, I guess. Nathan is now 26, completing an M.S. in geosciences at UT Austin this year; he's grown to be one of the more forthcoming and ethical people I know.

I began taking on leadership roles in high school and college. This does not mean that I was a leader; I just was willing to take on the roles, and I seemed to have some aptitude for it. I have worked for, and with, many managers and leaders in industry, government, and academe—some effective, others less so. The result of my experiences is a far-from-perfect, and continually evolving, construct of what constitutes leadership.

- A title grants authority, but it does not automatically bestow leadership. Those being led are the ones who ultimately confer the mantle of leadership.
- A leader doesn't expect things of people that he or she is not willing to do.
- Whereas a manager might be threatened by "insubordination," a leader embraces the opportunity to engage with a passionate person and then redirect together.
- If certain individuals in your organization are consistently associated with top-performing teams, it is no accident. They are your leaders.
- Executives often "fix problems" and move on to the next issue or the next company. In contrast, leaders recognize that organizations are dynamic, and they know the value of long-term relationships.

A leader is grateful without pandering, shares credit without being gratuitous, is supportive but does not indulge, makes decisions but is not dictatorial, is respected while not always popular, and is able to act even with limited information.

Perhaps most importantly, leadership involves risk. I have taken my share of personal risks in the past. "Lowlights" include summiting a Colorado fourteener, only to have a charged cloud attempt to burn a hole in my forehead; being within spitting distance of the Devils Tower summit, only to be forced to rappel off by a sudden snowstorm; plunging in a hang glider from a cliff in Brazil into dense fog; grabbing a cactus to prevent falling from a cliff in Arizona; nearly drowning while body surfing in a post-storm riptide in Kauai; being pinned on a rock wall in New Mexico while lightning pummeled the surrounding rocks; parachuting solo from a perfectly good airplane; and tracing the mid-Atlantic Ridge in a helicopter in Iceland, only to pull up in a steep vertical to avoid unforeseen power lines. Although these "heroics" focused my senses, it was undoubtedly my overly high luck-to-intelligence ratio that usually carried the day. Nevertheless, these experiences helped make me who I am, both as a person and as a leader.

Taking personal risk is one thing. More difficult is when you are partially responsible for the well-being and livelihoods of others. My family depends on a relatively stable dad. The 250 people at the Bureau and their families expect an organization they can be proud of and that supports them throughout their careers. Members of the

professional societies I have had the honor to serve have earned the right to expect an ethical, transparent, hardworking, and visionary leader. Someone not threatened by smarter people, who will hear colleagues' challenges and follow through, who makes thoughtful decisions in the face of uncertainty, and who is not too proud to adapt to a decision that did not play out as expected. A leader who will bring diverse groups together and do the work required to navigate a positive path forward, resulting in a stronger whole. I am not this leader, but I will continue to strive every day to try to become such.

As I look more broadly at geoscientists in the oil and gas industry, I ask myself: What are our roles as leaders? What duties do we have to educate others regarding the interplay between energy, the environment, and the economy? How can we continuously improve as environmental citizens? It can feel frustrating at times to be criticized on seemingly all fronts. But for the most part, these attacks represent a lack of public education about the tremendous scale of energy demand. There's a plethora of misinformation regarding actual-versus-perceived environmental impacts of oil and gas operations, and the significant strides being made to improve these impacts. Because the reality is that every form of energy at scale has challenges—environmental and otherwise—it is vital that we educate the global citizenry. In the end, only we who are engaged in the business of energy are best equipped to provide the objective, fact-based, balanced information that will advance society. The oil and gas industry is far from perfect; on that we can agree. But the overwhelming positive impacts are everywhere and often lost in the conversation. I am proud to be a leading voice for energy, and for the role that oil and gas play in society. I urge each of you to join where you can in this vital educational endeavor.

I am humbled to receive the Halbouty Outstanding Leadership Award. I deeply appreciate the many folks whose mentorship and support have allowed me to grow and make what I do possible. Above all, I am grateful for my parents, Tom and Jan, and my family: Allyson, Nathan, Derek, Tyler, and Claire.

Onward!

Scott W. Tinker

HUSSAIN M. ALOTAIBI
Honorary Member Award

Citation—To Mr. Hussain M. Alotaibi, a great geoscientist and a visionary leader, leveraging his breadth of knowledge and depth of talent to establish the AAPG Middle East Region.

Hussain M. Alotaibi is revered as a champion of professional societies in the Middle East, distinguishing himself by advancing geoscience knowledge through his leadership role in promoting AAPG in the Middle East. He has been an active member of the association for more than 30 years, serving as president of the Middle East Region and distinguished member of the association's standing committee, which has given him a unique and current perspective on the challenges and opportunities facing the association, which continues to expand internationally. For his dedication and passionate enthusiasm, Hussain received AAPG's Distinguished Service Award in 2013.

Hussain graduated with a degree in geology from King Fahad University of Petroleum and Minerals in 1984, at which point he commenced his career with Saudi Aramco. Hussain's determination, drive, and unrelenting dedication enabled him to rapidly ascend at Saudi Aramco, achieving his first leadership role as the head of a major division (Reserves Assessment) in 1999. He did not stop there and continued his rise, becoming the head of a major department (Upstream Ventures Department) in 2007. Subsequently, Hussain served as the manager of several key departments, including Exploration Technical Services, with his current role being manager of the Exploration Resource

Assessment Department. This meteoric ascendency is a testament to his knowledge & ability, passion, commitment, professionalism, and, above all, his interpersonal skills.

Hussain, during his executive education, attended the Advanced Management Program in 2011 which was delivered in partership with the Wharton Leadership Program led by Wharton faculty, University of Pennsylvania. This program further strengthened his leadership skills and helped him to understand how to operate in an increasingly uncertain and complex business world.

He has been actively engaged in propagating geoscience knowledge through initiatives he has undertaken over the course of his professional career, spanning three decades. This journey began while he was studying at King Fahad University of Petroleum and Minerals, establishing the first Geology Club in the region to serve the geoscience community. His enthusiasm continued as he instituted the Dhahran Geoscience Society (DGS), first professional society in the Middle East, in 1987 along with other three senior professionals, being elected as its president in 1989.

Hussain has been extremely active with AAPG, in the region and beyond. He has been a member of the Region Council for 6 years (2007-2013), serving its members, while promoting AAPG to professionals and university students. His involvement with the association has provided him with a unique perspective of its operations, objectives, structure, and its many different business profiles. His representation as a participant and technical committee member in multitude of conferences, forums, seminars, and technical workshops has deeply enriched his professional understanding, and allowed him to develop a broad network, which includes academicians and other professionals globally.

Hussain was vitally instrumental in the establishment of the AAPG Middle East Section and was elected as its first president in 2009. His responsibilities involved setting the strategic direction for and managing all activities related to the association. Some of these activities include participation in the monthly meetings, GEO, ACE, ICE, and traveling to visit local universities, IOCs, NOCs and service companies. During his tenure as president, he promoted the International Barrel Award program in the Middle East region. He established several student chapters in the region, educating them on the benefits of becoming AAPG members. Since Hussain's involvement in the Middle East region council, a number of GTW's/conferences have been held in the region.

In his role as Middle East region president, Hussain was very successful in the Association's Outreach Program and conducted visits to all countries in the Middle East where he presented to geological associations and at universities. These visits were extremely important to the success of the outreach program, strongly branding AAPG's name in the region and educating potential members on the benefits of membership. During his tenure as president, the first edition of the Middle East Newsletter, *The Discoverer* was made available to the members in early 2011.

Due to his breadth of knowledge in the field of resource and reserve management, he was one of three members chosen worldwide, of SPE/AAPG/WPC Oil and Gas Reserve Committee in 2005, where he played a leading technical role in formulating the 2007 SPE Petroleum Reserves Classification, Definitions and Guidelines. He was also a distinguished lecturer for the Society of Petroleum Engineers in 2005, where his session on "Minimizing Uncertainty in Petroleum Reserves" was widely acknowledged.

At Saudi Aramco, he has led the concept generation and process management effort to add hydrocarbon reserves from extensions and discoveries. He also headed the Integrated Reservoir Management Program. One of the main objectives of this program was to promote, on an international basis, reservoir engineering techniques and best practices relating to the development of oil and gas fields, in order to optimize, technically and economically, company resources and create additional value.

In his current role as manager of perhaps the most strategic department at Saudi Aramco, the Exploration Resource Assessment Department, he conducted the regional petroleum system-based yet-to-find resource assessment, of conventional and unconventional hydrocarbon resources of the Kingdom of Saudi Arabia.

Hussain M Alotaibi is a person who sincerely feels affection for his profession, his family, his friends, and the geoscience community. He is a role model for all of us who has made a difference and greatly deserves the AAPG Honorary Member Award.

Abid G Bhullar

Response

I feel extremely honored and appreciative for receiving this significant and high-level award from the best and the largest geosciences society in the world, truly it did touch me. It boosts my confidence and inspiration to realize my expectation in voluntary work with professional associations as AAPG where individuals stand the chance to become global players. In line with this, I am very thankful for the award, which definitely helps to alleviate my emotion to give more to AAPG and the geosciences community in general. "A journey of a thousand miles begins with a single step" has always been my life philosophy in pursing my dreams to better myself in order to contribute to society and feel good about myself. I believe in the added and created values of AAPG because giving to the geoscience community means creating positive impacts not only for the community but also for myself.

During my 32 years as an active member of AAPG and the 6 years of serving the AAPG Middle East Region as president-elect, president, and past-president, I have put every effort into maintaining the highest level of dedication and achievement. During my time as a member of the Middle East Region executive committee, AAPG has provided much-needed motivation and career development through providing networking opportunities with like-minded professionals and industry leaders. I would like to thank AAPG for considering me for this prestigious award.

Hussain Alotaibi

REBECCA LEE DODGE
Honorary Member Award

Citation—To Rebecca Lee Dodge, for outstanding service to the Association and the profession in national, regional and local societies through her leadership and dedication to earth science education.

Rebecca Dodge is an excellent choice to receive the AAPG Honorary Member Award. I have known Rebecca for over 30 years both as a coworker, friend, and colleague working to further the teaching of science of geology in independent public school districts throughout the United States and other countries. Her dedication to this endeavor has served as an inspiration to many educators around the world.

Rebecca knew at an early age that she wanted to be a geologist. She went on a field trip with her father, Charles Dodge, and a group of his university students, and at the end of the day, she announced that she was going to be a geologist. She has never looked back! Her dedication to her profession and to her volunteer interests is an inspiration to all.

Rebecca became a student member of AAPG in 1973. She received her B.S. in geology from University of Texas at Arlington in 1975, having studied for 4 years under her father. From 1975 to 1982 she attended Colorado School of Mines, receiving her M.S. in geology in 1978, followed by her Ph.D. in geology in 1982. She was one of the first women to receive a Ph.D. in geology from CSM. During her years as a student in Colorado, she worked for the US Geological Survey in Denver.

Rebecca began her professional career with Exxon Production Research in Houston From 1982 to 1989 she was a

research specialist for several divisions, including satellite imagery, gravity and magnetics, and regional studies. During her time with Exxon, she began working with the Girl Scouts and visiting public schools to give presentations on geology.

Rebecca moved to Dallas in May 1989 to work with Calvin Miller for Hunt Overseas Oil Company. She became active in the Dallas Geological Society, serving as chairman of the Youth Activities Committee from 1989 to 1991. She served as president of the DGS from 1992-1993. Her activities in the DGS enabled her to work closely with Stan Pittman and Pat Gratton, whose mentorship she has appreciated and enjoyed. She became a member of the Visiting Geologist Committee in 1991, and through the years has visited 25 colleges and universities. She served as co-chair of that committee from 2005 to 2007.

From 1992 to 1996 Rebecca was an independent geologist, forming the photogeology-focused Aral Interpretation Services. At the same time she worked with her father in Eastward Oil Company, which had a special focus on Chinese oil exploration. During this time, she developed a working relationship with Professor Li Desheng of RIPED in Beijing. She formed Sinotech, Inc. in 1994 to continue her involvement in China.

In 1996 and 1997 she received the Certificate of Merit from Energy Minerals Division of AAPG and was on the convention coordination committee as vice-chairman for EMD in 1997. From 1995 to 2003, she worked with the Geosat Committee, Inc., an industry-sponsored applied remote sensing group, serving at one time or another as chairman, research coordinator, and executive director.

In 1996 Rebecca became a research specialist for the Pan-American Center for Earth and Environmental Studies at the University of Texas El Paso. She became director of research and training of the Geosat Committee and formed a partnership with the GLOBE environmental science K-12 teacher training program. During her time in El Paso she served on the Educational Outreach Committee for the El Paso Geological Society.

In 1999 she moved to Carrollton, Georgia, where she served as associate professor on the faculty of the Geosciences Department of the University of West Georgia. She established another GLOBE teacher training partnership at the university, working closely with the College of Education on expanding science education for pre-service teachers. From 1999 to 2006 she supervised more than 12 student research projects.

While associate professor at the University of West Georgia, she was the Georgia Geological Society's delegate to the House of Delegates from 2002-2008. She also served on the Distinguished Lecture Committee from 2004-2006, the House of Delegates Rules and Procedures Committee from 2007-2008, and the Student Chapters Committee from 2005-2008.

In August of 2008, Rebecca moved to Wichita Falls, Texas as associate professor in the Department of Geosciences at Midwestern State University, where she has taught petroleum, structural geology, and remote sensing geology to undergraduate students based on 14 years of experience working full time in the industry and 19 years as a part-time consultant.

Her contributions to Earth Science Education over the years are many, including performing outreach to K-12 classrooms and providing Earth Science education workshops for K-12 teachers in Dallas, Houston, and El Paso, Texas and for teachers in West Georgia. She developed the Earth and Space Science for Teachers, a 5-day hands-on workshop for North Texas teachers, with support from the North Texas Geological Society. She also developed with the support of Stan Pittman and Herbert Hunt an online version of Earth and Space Science for Teachers, which is now being offered nationally through the American Geoscience Institute with funding from the AAPG Foundation.

Rebecca has authored and coauthored numerous geoscience publications while serving as a delegate for various professional societies. She is also past president of the AAPG Energy Minerals Division and

Division of Environmental Geosciences.

Dodge received the AAPG's Distinguished Service Award in 2010. Dodge served on the Youth Education Activities Committee from 2012-2015, and as chairman of the Public Outreach Committee from 2012-2015. She is currently the vice president of the Southwest Section of AAPG, and treasurer of the North Texas Geological Society. She has served as the adviser for two student chapters of AAPG, at the University of West Georgia and at MSU. In April of 2016, she received the Distinguished Educator Award from the AAPG Southwest Section. In giving Rebecca the Honorary Member Award, AAPG acknowledges that she embodies the spirit of dedication and service that makes AAPG a vital force for our profession.

Lewis S. (Stan) Pittman

Response

It is a genuine honor and a blessing to be given the Honorary Membership Award by AAPG. AAPG has been a part of my professional life since my senior year in college. I joined during my final semester at the University of Texas at Arlington, prior to attending the AAPG Convention in Dallas with several of my peers. My first icebreaker was such a great opportunity to meet interesting, active geologists. My department chairman, Charles F. Dodge (also my Dad) encouraged all of the seniors to join AAPG and attend the convention. This was the beginning of many years of rewarding networking, connecting me to real, live petroleum geologists who were finding and producing oil. Connecting with my peers (and a long time ago, with my elders) has always been the best part of my participation in AAPG.

I have been able to learn, continuously, from the many opportunities provided by AAPG. I have presented my work and learned from the comments and suggestions of my peers, which has led to better understanding and improvement of my technical skills. I have devoured both *Explorer* and *Bulletin* articles with joy—how interesting geology is! I have attended short courses and field trips, poster sessions and oral sessions, and have especially enjoyed judging at both section and national meetings. I have been able to learn in particular from judging both oral and poster sessions, and in recent years have mostly been volunteering to judge student posters. This is exciting and encouraging because it proves to me that our young professionals are truly able to fill the gaps that folks my age are leaving in the profession.

Volunteering has always been important to me; AAPG truly is my service organization. I have been privileged to serve on many committees and to be nominated for or elected to several offices in the organization. I have served as a committee chair several times, as a delegate, and as the president of two divisions. At every point of service I have been involved with dedicated, smart people who understand what a professional can gain through service: true friends and valuable network that can self-activate when one is in need of advice, or sometimes even a job. AAPG has been there for me while I was employed and self-employed in the industry, and continues to work for me since I came to academia.

I am at an interesting point in my career. I have spent 16 years in the petroleum industry, and now have 16 years as a geoscience professor. I hope that I have been one of those professors who always portrayed the petroleum industry as one of the best career alternatives. I know that many of my students are actively exploring, drilling for, and producing oil and gas. I have been exceptionally proud when one of my students drilled his first wildcat just 1 year after graduating from Midwestern State University, where I now teach. I am also very grateful to be coordinating a new graduate program at MSU, where most of our students are focused on a future career in the petroleum industry.

As I near "retirement," I have a new career focus in mind. I've been developing it some time now, with the help of mentors like Pam and Bill Stephens, Stan Pittman, Herbert Hunt, and of course my family (my Dad, Mom and sister are all educators). For several years now I have been offering a course designed to prepare middle and high school

teachers to teach earth science, with a firm basic content background as well as deeper access to resources that expand their knowledge and skills. This course is now offered online through the American Geosciences Institute, nationwide. I hope to expand the number of teachers taking this course both nationally and internationally, and thereby expand the number of high schools offering earth science classes that will prepare students for a college major in geosciences and engage a driving interest in resource exploration and resource management. I have already activated my AAPG network to recruit teachers and to fund their scholarships, through Southwest Section. Can your section or region help? Think about it and join the effort!

Finally, I want to encourage young professionals to volunteer early and often for service within AAPG. I was just beginning my professional career as the AAPG Visiting Geoscientist program was expanding. My management told me not to bother getting involved because it wouldn't help me get promoted. I had to change jobs to find a different management perspective, and I have since visited two dozen campuses. Encouraging students at the college level to continue in a resource exploration degree plan shouldn't be too hard for you. I explain to the students with whom I visit both here and internationally, that they are an important part of that whole "saving the world" thing. Not only are they keeping electrical and transportation power available for the developed world—they are also providing people in the developing world with the power that has already improved their educational, health, and economic opportunities. Our young geology students hear too often that they are part of the problem. They are told that fossil fuels are actually evil and need to disappear. This is nonsense. We need to remind them that they are part of the solution. If you love our industry, you should love it. Share your experiences, excitement, and perspectives with people of all ages, and support good science education at all levels. Thank you for all that you do!

Rebecca Dodge

MICHAEL FORREST
Honorary Member Award

Citation—The "bright spot" geophysicist, who provided our industry with one of its most powerful tools for discovery of oil and gas fields.

Mike Forrest is an extraordinary explorationist, especially in seismic interpretation. He has transcended his original training in geophysics to be an originator of the most important modern innovation in oil and gas exploration—direct detection of hydrocarbon accumulations from analysis of seismic data.

Mike learned the basics of seismic acquisition during the mid 50s when he worked two summers doing field work on Shell Oil Company seismic crews in Texas while a student at St. Louis University (B.S. geophysical engineering, 1955). After graduation, he joined Shell on a South Louisiana seismic crew. Shell transferred Mike to the New Orleans Marine Division in 1959 where he quickly learned seismic interpretation and (GOM) of Mexico geology.

During 1962 to 1965, he was seismic party chief of a South Louisiana seismic crew with an office in Metairie, Louisiana. After returning to the Marine Division in 1965, Mike continued to improve his interpretation skills and his coworkers sometimes commented he had a photographic memory for seismic lines.

In 1967, Mike mapped a low relief closure called Prospect #370 in the oil rich Main Pass area, east of the Mississippi Delta. Shell won leases on the prospect, but drilling only encountered gas pays at a depth of 3000 ft that were considered noncommercial at the time. Mike noticed the gas pays

correlated with strong reflections on seismic data and the sonic log indicated abnormally very slow velocity—this observation was the beginning of the "bright spot" history in Shell Oil Company. The term "bright spots" was jokingly used by Shell Oil associates to describe the whitening appearance of such anomalies on seismic sections.

In 1968, Mike observed altered seismic amplitudes on the crests of many exploration prospects in the GOM shelf Pleistocene trend working with high quality proprietary Shell seismic data where very little well data was available. He read a Russian abstract that described general effects of seismic velocity and density in hydrocarbon-filled vs. water-filled reservoir rocks. During 1969, he correlated seismic amplitude anomalies, bright spots, to oil and gas pay zones in several Pliocene and Miocene offshore fields which was presented to Shell exploration executives, who quickly made decisions to verify the observations.

Mike discussed the bright spot observation with Shell's petrophysical and seismic research to quantify the relationships he had seen on seismic data. A small research team validated Mike's observations and specified the conditions where direct detection observations of hydrocarbons would be reliable. Later, many others have made powerful and important improvements in the field.

Starting in 1970, Shell relied on seismic amplitude anomalies to acquire many leases on the GOM shelf. The first major discovery was Eugene Block 331 where stacked oil and gas pays have produced 150 MMBOE. Shell technical staff, notably Bill Scaife and Harlan Ritch, used the petrophysical data from the Louisiana and Texas shelf to make so-called trend curves that graphed seismic reflection coefficient vs. depth for gas, oil and water with either a hard or soft shale as the overlying seal. Sand quality was also considered. This data was used to interpret bright spots on prospects in the 1972 lease sale. The economics of oil were superior to gas and Shell used the trend curves to predict oil on a prospect now known as South Marsh Island 130 field with 250 MMBOE, mostly oil.

Economic analysis was based on probability analysis for oil, gas, or wet sands to estimate risked resources and Shell senior management approved aggressive bids. Shell Oil discovered hundreds of oil and gas fields, especially in the GOM, with this technology and its early utilization provided a remarkable advantage to Shell's exploration teams.

Shell Oil was a GOM deep-water explorer as early as 1962 when several leases were oil and gas discoveries—deep water at the time was 500 ft of water. In 1974, Shell and its partners used bright spots to win leases on Prospect Cognac located in 1000 ft water—ground breaking at the time. The field has produced approximately 300 MMBOE.

Shell expanded the application of bright spots to deep water GOM (water depth greater than 1500 ft) where previously, commercial reservoirs or hydrocarbon charge had not been documented. In the 1983 to 1985 GOM area wide lease sales, Shell acquired many leases in water depths out to 6000 ft; many bids were unopposed as the company was the leader in the play at that time.

Well-known bright spot discoveries are prospects Bullwinkle, Popeye, and Powell (now called Ram Powell). The latter is a pure stratigraphic trap in turbidite sands with a bright spot on a weak south plunging structural nose. Mensa Field is 900 BCF gas discovery based on an excellent bright spot.

Shell discovered the 1+ billion barrel Mars oil field in 1989. Mars was leased in 1985 as a speculative prospect and drilled as a high-risk prospect because the amplitude anomaly did not conform to closure (because of stratigraphic variations and structural interpretation issues). But the prospect would probably not have been leased or drilled without the presence of a bright spot; multiple deeper oil-bearing sands were found with subtle or no amplitude anomalies on seismic data available at the time.

It is hard to overemphasize the importance of a technology that, in the right geologic settings, predicts presence and type of hydrocarbons, and thickness, extent and quality of reservoir.

Oil companies are still learning to improve the interpretation of direct hydrocarbon Indicator's (DHI) on prospects worldwide,

especially in deep water. Amplitude vs. offset technology was introduced in the early-mid 80s and is now an important part of the DHI interpretation tool kit.

Mike has continued his interest in the application of bright spot, now called DHI technology by chairing the Rose & Associates DHI Risk Analysis Consortium during the past 16 years. More than 60 oil companies have been members of the consortium and 275 DHI prospects have been reviewed to document "lessons learned" and significant seismic amplitude anomaly characteristics for a successful prospect.

As current chair of the SEG Foundation and an active member of the AAPG Trustee Associates, Mike continues his sterling record of service to our profession.

Marlan W. Downey

Response

I am honored to receive AAPG Honorary Membership. During the late 1960s, I was fortunate to be a seismic interpreter with Shell Oil Company mapping exploration prospects in the Gulf of Mexico. After observing high amplitude reflections on the crests on many structures, I documented several cases where the amplitudes were associated with oil and gas pays. In hindsight, the physics is simple: seismic amplitude anomalies can be observed related to changes in the velocity and density of oil and gas sands vs. water bearing sands, but there were many skeptics "at the time."

Many Shell Oil Company geoscientists and petrophysicists contributed to the development of "bright spot" technology within Shell, so this award should be considered a joint honor.

During the early 1970s, Shell staff and middle management recognized the value of bright spots by applying probability methodology to estimate risked resources to calculate bids for leases in very competitive Gulf of Mexico lease sales. Shell senior management supported the technology by approving aggressive bids. I will always remember the Prospect Cognac discovery (300 MMBOE) when the logs were transmitted to One Shell Square in New Orleans about midnight on a Friday night in early 1975—the "bright spot" interpretation (three oil pays) by our geophysicists was near perfect and we celebrated at 5 a.m. with a glass of champagne.

Gulf of Mexico deep-water exploration was a highlight when I was Shell's general manager exploration from mid-1984 to mid-1987. Bright spot interpretations were integrated with regional and prospect geology to bid on many Gulf of Mexico deep-water prospects that led to significant oil and gas discoveries. Mars, a 1+ BOE field, was leased as a spec prospect in 1985 and was drilled in 1989 after I moved to another assignment in Shell—glad our team made a "last minute" decision to bid on the prospect as the discovery changed the deep water exploration paradigm.

Finally, my career with Shell led to an association with Rose & Associates as chair of the DHI Interpretation and Risk Analysis Consortium during the past 15 years. More than 60 oil companies have been members of the Consortium for at least for 1 year. Lessons from the 265 DHI prospect database study includes understanding the geology (I like to state "geology first"), the importance of seismic and rock physics data quality, and the most significant DHI anomaly characteristics for a high probability of geologic success prospect.

Exploration learning is a lifelong effort and teamwork leads to success.

Thanks again for AAPG Honorary Membership.

Michael C. Forrest

LAWRENCE D. MECKEL
Honorary Member Award

Citation—To Lawrence (Larry) D. Meckel, master of the unconventional petroleum systems, for a remarkable career that has encompassed research, exploration and teaching. His work as a leader in the field has not just informed, but inspired, many.

Larry comes by his love for geology naturally—and it started early. He grew up in Baytown, Texas, and says he collected rocks on his family's summer vacations. When he attended Rice University, he was able to fully indulge his passion for rocks and all of their wonders; he graduated with a Bachelor of Arts in geology in 1959, with honors and as a member of Phi Beta Kappa. He then pursued graduate studies at The Johns Hopkins University and left in 1964 with more than he expected. In addition to receiving his Ph.D. in geology, Larry met and married Barbara Toan, who was completing her master's degree in the same field. The two have been together ever since and have accomplished a great deal together, including raising four sons, traveling the world, and working side by side.

After completing his Ph.D., during which he spent a few summers working for Shell Development Company, Larry began his career as a research geologist in 1964 with Shell Development in Houston. Assigned to the Recent Clastics Project, an initiative designed to document modern depositional sand models on the East Coast, Gulf Coast, and Pacific Coast. His innate curiosity and refined knowledge combined to make Larry a natural researcher; he eventually became the leader of the project. Larry says the modeling work he accomplished with this project created a continuous thread throughout his career; today, his Recent Sand Model: Key to the Subsurface course, which is based on the project's outcomes, is still one of the most successful courses he has ever taught.

As an explorer, Larry has traveled far and wide. He has studied systems in virtually every basin in Canada, the United States, and Mexico, and, in recent years, has looked at and evaluated basins in Europe, South America, and the Middle East. Larry's exploration career began closer to home, searching for conventional fields from Denver, Ventura, and New Orleans. In 1974, his focus shifted to a more unknown type of play: unconventional tight gas. After working in the San Juan Basin and the Alberta Basin, Larry and his partner, Bob Sneider (together, Sneider and Meckel Associates) worked closely with John Masters, Dave Smith, and myself (a team with Canadian Hunter Exploration) to discover the massive Elmworth Field in the Alberta Basin. This was a career-changing event for Larry, as it was for many of us.

From 1976 on, he has worked in unconventional plays, shifting his focus from gas to oil in 2008. Having been introduced to the concept of horizontal drilling in the early 1980s, Larry was one of the first geologists to embrace and explore its technological possibilities. As I have experienced while working with him myself, Larry's passion for exploring new ideas—and for collaborating with others—is just one of the reasons he has been so successful as an explorer. As president of L.D. Meckel and Company, which he began in 1981, Larry continues to provide his expertise as an exploration consultant for companies and plays around the globe. Throughout his career, his work has led to the discovery of fields in Alabama, British Columbia, Tamaulipas (in Mexico), Texas, Oklahoma, and Alberta.

Larry is also well known, and has been celebrated, for his ability to take findings from the field and share them with curious minds. He has taught countless courses and field seminars in clastics, carbonates, and unconventional petroleum systems, not to mention an array of other subjects, for more than 50 companies worldwide, and in a number of AAPG, SEG, CSEG, and HGS schools. In 2005, the Colorado School of Mines in Golden, Colorado, asked Larry to take over their Advanced Petroleum Geology graduate course, which led to several other graduate courses. He currently teaches Unconventional Petroleum Systems there and holds the role of adjunct professor in the school's Geology and Geological Engineering Department. Larry teaches at the graduate level and relishes the opportunity to share his experience and insights with students and industry professionals alike.

They, in turn, have relished the opportunity to learn from him. In 2011, Larry received the Grover Murray Distinguished Educator Award from AAPG—an honor

bestowed on him for his tremendous services in both industry and academia. Robert J. Weimer, a fellow AAPG member who wrote the citation for Larry's award, acknowledged Larry's "dedication to educational excellence" and thanked him "for enhancing the professional careers of members, students and others." Larry is certainly a dedicated educator to many.

Beyond industry and academia, he recently began offering continuing education courses to people who are simply interested in learning more about geology and how the Earth works. What began as field trips for the Ouray County Historical Society has evolved into courses for the OLLI program at the University of Denver and for the Wright Opera House in Ouray, Colorado. Teaching curious nonscientists, he says, has been "a rewarding addition" to his life's work.

Larry is also a longtime member of AAPG, as well as a member and active participant in the Mexican Geological Society, the Rocky Mountain Association of Geologists, the Society of Exploration Geophysicists, and SEPM. He has authored and coauthored more than 15 papers, as well as more than 100 in-house proprietary reports and studies for a large number of oil and gas companies. There is no doubt that Larry has made a lasting impact on the industry, inspired his colleagues, students, and citizens, and shown what it means to be a true leader.

For his extensive success in exploring unconventional oil and gas, for his ability to research and synthesize data, and for his wonderful ability to share his knowledge with others, Larry is a truly worthy recipient of AAPG's Honorary Member Award. As his colleague and friend, it is my honor to write his citation. Congratulations, Larry.

Jim Gray

Response

I am truly honored to receive the Honorary Member Award. I thank those colleagues who considered me worthy of nomination, the Awards Committee, and AAPG. I also thank my longtime colleague, friend, and biographer—Jim Gray—for his time and kind words in the citation and biography.

Moments like this provide the opportunity to reflect on one's career. What stands out are those milestones that significantly alter and redirect one's career—commonly called career changers—and even more importantly the key people who created those opportunities and the many mentors and colleagues who helped achieve those projects. I was fortunate to be involved in the research, exploration, and teaching facets of petroleum geology. So I would like to comment on important milestones in each of these endeavors and to recognize those people that were so important in making each possible.

In the 1960s the visionary for Shell Oil's highly acclaimed research program (Shell Development Company) was the exploration vice president, R. E. McAdams. This is where my career started; Bob Nanz, the geology research manager, hired me for Shell Development and assigned me to the Recent Clastics Project under the supervision and guidance of Rufus LeBlanc and Barney Bernard, two Cajuns whose passion was the development of modern clastic models. How truly fortunate, as the lessons learned here—how to recognize, how to correlate, how to map, how to predict clastic reservoir—were invaluable, and I have used those concepts throughout my career. My industry course Recent Sand Models, still my most requested course, was an attempt to bring many of those observations together for practical subsurface application. I have truly enjoyed passing on those early lessons and how to use those models for exploration and field development to both industry professionals and graduate students.

My later stint as geology research manager at Shell Development was invaluable as it exposed me to important new facets of petroleum geology: namely carbonates, pressures, geochemistry, and stratigraphic geophysics. All these would become invaluable down the road.

I then shifted into exploration, doing regional studies, generating oil and gas prospects, or recommending drilling

locations for various companies. There were a number of important milestones in exploration. Initially Shell Oil provided important opportunities in both onshore and offshore areas in the United States. Then starting in 1974, with Sneider and Meckel Associates and later as L. D. Meckel and Company, I was very fortunate to be part of several other skilled teams working the Texas gulf coast, western Canada, and Mexico. The Texas team comprised Bob Sneider (my business partner), Leon Wells, John Farina, and Lloyd Fons. We used the recognition of bypassed pays in older dry wells (not a typical exploration approach at that time) to generate opportunities which led to some dry/uneconomic wells but fortunately also to the discovery of a number of new fields, mostly in the Texas gulf coast but also in Oklahoma. Those successes were an important confidence builder for our young team.

In 1974, a new Canadian exploration company (Canadian Hunter Exploration Limited) founded by John Masters and Jim Gray provided the opportunity to apply that exploration approach to the Western Canadian Sedimentary Basin. The Texas team joined with the early Hunter team comprising Masters, Gray, Dave Smith, Earl Hawks, and Howie King to identify opportunities that led to several small discoveries updip in the basin. Then the fingerprints of a giant downdip field began to emerge resulting in Hunter's discovery in 1976 of the Elmworth Field in the deep basin, a significant discovery in an unconventional tight gas petroleum system. This became a career changer for many of us, as now our efforts were in analyzing the many new components of these large, strange, new unconventional fields and in using that early model to look for the "next one." The shift was back to the States with American Hunter, Canadian Hunter's US subsidiary. That work took us to the Pinedale Anticline with a farmout from El Paso in the early 80s. Four subsequent dry or shut in wells down the axis of the anticline documented the model, namely the presence of pervasive gas in multiple tight reservoirs, but the reservoirs proved to too tight for existing completion technology.

Starting in the 1990s, Alfredo Guzman, Genaro Ziga, Guillermo Cruz, and Antonio Cuevas with Pemex asked that I work all their various onshore and offshore basins in Mexico with their teams to look for new opportunities. I was initially teamed up with Ricardo Padilla of their head office staff to visit each office. The various resulting studies with the Pemex teams led to a number of discoveries including the giant Deep Arcos Field in the deep, tight Wilcox. It was a twin to the South Texas Bob West Field directly across the border which I had worked on earlier.

In exploration I have been fortunate to be involved in unconventional petroleum systems starting at the ground floor in the early 70s. At the beginning there were many unknowns to address. Here the valuable insights of several people played an important role in understanding these systems: Bob Sneider, John T. Smith, and Fred Meissner. They had a common and extremely important approach—understand the chemistry and physics of these unusual petroleum systems. As Fred was so prone to say: "if you want to find oil, think like a drop of oil. What forces are going to generate you, move you, and stop you." In the early 80s, Sandy McCormick (president of McCormick Oil and Gas), introduced me to a brand new, yet unproven, technology that would forever change the exploration landscape, namely horizontal drilling. With Sandy, after considering many viable units, we concluded that the tight Austin Chalk and the Upper Cretaceous Olmos sands, both already marginal vertical producers, were likely candidates for this new technology.

Teaching courses has always been part of my career, starting with those early Shell days with lectures and co-leading field trips as part of their extensive training program. My teaching expanded to many one-week courses offered by the consulting companies of Sneider and Meckel Associates and later L.D. Meckel and Company. Many were co-taught with Bob Sneider who brought his vast experience

and valuable insights in training to our new effort. In 2005, thanks to Bob Weimer and his colleagues, I was asked to join the faculty at the Colorado School of Mines as an adjunct to teach "Advanced Petroleum Geology" at the graduate level. Now the challenge was to work with bright, enthusiastic students. Thanks to the guidance of Steve Sonnenberg, the new chair of Petroleum Geology at Mines, my course shifted to unconventional petroleum systems. I currently still enjoy passing on my experience with these unconventional petroleum systems to both students at Mines and also to professionals via industry courses.

In essence, one's career is really defined by key people who provide those unexpected opportunities (career shifts) and those very important colleagues and mentors who provide the supervision and technical talent to accomplish those goals. In summarizing the above milestones, there are many colleagues who I have not (for space purposes) specifically acknowledged; you all played valuable roles with your insights and work contributions. To each of you, as well as those mentioned by name, I am ever grateful.

But there is one person who stands out through all those activities, starting in 1964 and continuing even to this day. That is Barbara Meckel: my wife, life companion, fellow geologist, and business advisor. Her support and assistance at each step truly made the difference. To her also I am ever grateful. She is also the mother of four outstanding sons—Trey, Bret, Tip, and Kit—who have had to listen to a lot of geology in growing up in our family and on our many travels. Trey (industry) and Tip (BEG) are carrying on the family geological legacy. Bret (SUNY Delhi) is a veterinarian, and Kit (design-build) is an architect. Each has done well in his chosen field, and Barbara and I are indeed proud of their successes. They, and now their families, have continued that valuable support and encouragement. Thanks family.

All through my career, AAPG has provided that necessary framework for the transfer and distribution of technical data, information, and insights through their many publications, industry seminars and courses, and conventions. Thanks to all of you over the years who have so capably administered and led the society to accomplish its many goals. My involvement with AAPG has largely been through the education department, early on with the Visiting Petroleum Geologists program to universities, then as instructor in various seminars and industry courses, and more recently as co-leader of unconventional petroleum system field trips for conventions. These small involvements over time have been my attempt to repay my gratitude and to contribute to an organization that has provided so much.

I am indeed humbled by the recognition associated with this Honorary Member Award. Thank you very much.

Larry Meckel

VALARY L. SCHULZ
Honorary Member Award

Citation—To Valary Schulz, for her unwavering commitment to the profession of geology, the American Association of Petroleum Geologists, and whose exemplary leadership continues to be an inspiration to all her colleagues and acquaintances.

Honorary Member is bestowed upon persons who have distinguished themselves in service to petroleum geology and to the Association. No other person than Valary Schulz is better qualified to receive this award.

Valary was born and raised in Regina, Saskatchewan. She entered the University of Saskatchewan at the age of 17, and earned a B.S. degree in geology in 1971. She became a dual citizen in 1993 when she obtained her American citizenship. She was exposed to the geological profession early in life by her

father, Verne Hogg, who was formerly the Deputy Minister of Mineral Resources in Saskatchewan, and was instrumental in developing the oil and gas regulatory rules for that province of Canada. Her older sister and brother are also geologists.

Following graduation, she began her professional career working as a hard rock and mining geologist in northern Quebec for Campbell Chibougamau Mines, Ltd at their Henderson copper mine. Two years later, she decided to try a warmer climate in Central America, going to work as a mining geologist for Rosario Resources Corp. in the El Mochito lead/zinc silver district of Honduras. Rosario, based in New York, had an oil and gas subsidiary, Alamo Petroleum Co., located in Dallas. Valary chose to join Alamo in 1977 as a petroleum geologist. From 1979 to 1984 she worked in Dallas for oil and gas companies in exploration, development, and property appraisal, including Bonanza Petroleum, Inc., Willis and Associates and Quanah Petroleum. She once again returned to Rosario Resources in Honduras from 1984 to 1987, where she planned and directed multiple exploration programs resulting in several ore discoveries. Relocating to Dallas, Valary worked as a consulting geologist and ultimately a partner with LaRoche Petroleum Consultants, Ltd. from 1987 to 2003. From 2003 to the present, she held managerial positions with several Dallas based independents, including Matador Resources Company and Cinco Resources. She is currently working in her preferred field of petroleum exploration geology as a consulting geologist and president of VSW Holdings Inc. in Dallas.

When joining Alamo in 1977, Valary's supervisor and mentor, Tom Mairs, advised her to "get involved"—she did with gusto. Her inherent instinct "to serve," has resulted in no less than 52 committee affiliations as recorded by AAPG, ranging from committee memberships to chairman of the House of Delegates and president of the Division of Professional Affairs. Beginning in the early 1980s, Valary has been actively involved in the affairs of the Dallas Geological Society and in AAPG. In the former, she held several offices on the Executive Committee culminating in becoming president in 1984. She was awarded Honorary Life Membership in 2002.

Valary joined the association in 1978, and among her numerous committee memberships, she's been very active in the Southwest Section having served on the Executive Committee secretary, 1994-1995 and president/past president, 2000-2002. For her dedication to service, she received the John Emory Adam's Distinguished Service Award in 2008. Valary has also been active and served on the Executive Committee of the Dallas chapter of the Society for Independent Earth Scientists as an officer and chairman from 1995-1999, and as national director 2002-2005.

Valary's longterm service to the House of Delegates began in 1992 as an elected delegate, and continues to this day. During her tenure she has served on several House committees, including the Resolutions Committee, chairman 1998-2001, Constitution and Bylaws Committee, chairman 2002-2003. She was selected as chairman-elect, 2003-2004 and served as chair, 2004-2005. The House has honored Valary with the Recognition of Service Award 2005, and the House's highest Honorary Member Award 2006. As House Chairman, she served on AAPG's Executive Committee, 2004-2005, and the Advisory Council 2005-2006. In addition, Valary has well served the Visiting Petroleum Geologists Committee, 1999-2002, and the annual convention's Coordinating Committees in 1983.,1991, 1996-1997, and 2004-2005. She received a Certificate of Appreciation in 1997.

When asked what she believed has been her greatest achievement, Valary, without hesitation, named her two children, Danielle and Beau. This typifies her unassuming, humble, positive, tireless and dedicated demure—especially in light of her many contributions to her profession and the Association. It has been an honor to try and compile a citation worthy of her accomplishments.

Edward Heath

Response

President John Hogg's call informing me that I had been selected to receive this great honor came as a total surprise to me. I am truly humbled to be counted among the many great recipients of this award and accept with over brimming pride. Thank you to the AAPG Executive Committee and the members of the Advisory Council who promoted, supported, and approved this distinction. Thank you particularly to Ed Heath, my longtime friend and biographer, who has done a remarkable job of piecing together the unconventional course of my progression.

Growing up in Saskatchewan at the time I did, it was understood that after graduation one would have to leave to find work, at least for geologists who didn't stay on the farm. I didn't start out with the intent of studying geology, but through a happy circumstance I went to work for my father in the bush near Flin Flon Manitoba when I couldn't find a summer job as an English major. It wasn't long into my contract before I had decided that camp life with no running water nor electricity, oppressive black flies, hard work walking lines, running geochemistry samples and cooking sure beat sitting in an office. I was hooked, for life. On an infrequent trip to town for supplies we called the chair of the geology department to find out what I had to do to change majors. My father, LuVerne Hogg, was a consulting geologist at the time. He encouraged us to study a profession that offered opportunities, but never steered any of his four children into earth science. Yet 3 of the 4 of us went on to become geologists. His influence was mighty for a humble man with such a verve for life and the tenacity of a pit bull. We could see how much he enjoyed his profession and although I've had plenty of jobs over the last 40 years, it has never been work!

The education that I received at the University of Saskatchewan was classical. They taught me the principals of geology, and how to learn, and how satisfying that was. As a result I've been able to transition from hard rock mining into oil and gas and back. Though it was never a goal or even a consideration, I've achieved a lot of firsts. First woman to work underground at the Henderson Mine in northern Quebec, first woman to work underground at the El Mochito mine in Honduras; miners respect hard work, so I was accepted and treated as one of the crew. I rode mules up to the top of the cloud forest, surface mapping in the jungle, and they even paid me to do it! So when I transferred to work in oil and gas in Dallas during the late 1970s, my job representing Alamo Petroleum in the field at every logging run, every core, DST, or potential pay zone may have been a shock to some of the rig hands, and a lot of firsts, but I had a job to do, and I wanted to do the very best job anybody could. My mentor, Tom Mairs had confidence in me, he needed the "hep" and I wasn't going to disappoint! It was a marvelous opportunity and the very best of times, and they even paid me to do it!

Tom Mairs was a truly remarkable man; I owe him a tremendous debt. Yes, he "advised" me to get involved. I wasn't going to disappoint! I began a habit of putting my hand up when someone needed something. That changed over time into anticipating where a need was, and willingly taking on the task. It has been marvelously fulfilling, and I have received back in tenfold of gratification and even honors. So many of my dearest friends I meet every year at AAPG conventions around the country, at sectional meetings, and at my local DGS events. I'm hugely blessed with a caring network of likeminded souls who continue to give of themselves to our premier global organization. Thank you.

Valary L. Schulz

RICHARD K. STONEBURNER
Norman H. Foster Outstanding Explorer Award

Citation—To Dick Stoneburner for his creative exploration ability and his predominant role

in discovering the largest potential reserve of petroleum in the United States, the Eagle Ford Shale play in southwest Texas.

Petroleum geologists are essentially treasure hunters, searching for buried treasure that will have a positive economic impact. Just as deep-sea explorers search for fabulous sunken treasure or gold miners look for the "Mother Lode", petroleum explorationists dream of finding the big one—a mega field that has escaped geologic studies and wildcat drilling efforts through the preceding years.

A fortunate few actually realize their dreams—one of them is Dick Stoneburner who is being honored with the 2016 Norman Foster Outstanding Explorer Award. Dick deserves major credit as a predominant factor in the discovery of the mega field, the Eagle Ford Shale.

Norm Foster, in his President's Column in the May, 1989 edition of the *Explorer*, discussed creativity as vital to successful exploration. He included a quote from Ted Bear that summarized his thoughts about that subject. Ted wrote "The best science in the world cannot develop a prospect. Only the petroleum geologist through the creative assembly of all the disparate bits of scientific information available to him can accomplish this. New ideas in older provinces are not generated by data manipulators. They are generated by creative thinking"

This philosophy was front and center in establishing the Outstanding Explorer Award. In my opinion, Norm would have been heartily in favor of bestowing this honor on Dick Stoneburner for his world-class discovery thinking.

As background information, Roger Stoneburner, Dick's father, and I joined the California Company in New Orleans at nearly the same time in 1948. Roger was an excellent explorationist who was soon promoted to a significant role in the company. His career played a big part in the path that Dick would follow in future years.

Dick was born in New Orleans, Louisiana, on November5, 1953. I remember the date very clearly because I was marginally involved in his arrival. His mother, Jean, made a frantic call to our house early that morning to see if anyone was available to take her to the hospital. Dick was on his way and his Dad, Roger, had already left for work. Fortunately, I was still at home – she and I made a hurried trip to the Baptist Hospital, arriving just in time to welcome the newest Stoneburner.

In 1955, Dick's Dad left the Chevron subsidiary, the California Company, and joined San Jacinto Petroleum As a result, the family moved to Houston where Dick grew up, graduating from high school in 1972. During those years, he spent a lot of time watching his father work as a geologist. He went on logging runs, became familiar with rock type and fossils and was exposed to the life of a geologist.

When he enrolled at The University of Texas, however, he had a vague notion that he might like to be a lawyer or maybe a business major. By his junior year, though, he discovered that he really was not excited by either of those professions. He had taken Geology101 his freshman year and it had slowly become apparent that his real interest lay there—in the field that his Dad had mentored him in during those early years. He graduated with a degree in geology in 1976 and was ready for his first job.

Dick started his career as a geologist with Texas Oil and Gas in Wichita, Kansas. After two years, he decided to return to college to obtain a master's degree in geology—something that Roger firmly recommended. He received his M.S. from Wichita State University in 1981 and returned to work with Texas Oil and Gas.

Shortly after rejoining the company, a significant career-changing event occurred. Dick met Floyd Wilson, an investment genius, who specialized in buying small oil companies, building them up and then reselling them and starting over. Dick joined Floyd in the Kansas Oil Company as a staff geologist. In October, 1985, Floyd sold the company and Dick found himself to be unemployed. That was the height of the Oil Depression that saw oil prices return to the $10 level and few job opportunities existed. Dick started his own small company and spent the next 10 years as an independent and consultant. He describes them as very lean years with just enough success to keep his wife, Teere, and his three daughters in relatively comfortable circumstances.

That all changed for the better in 1996. Floyd Wilson had a prospect in Texas and he once again needed Dick's expertise to develop the play. After 10 years, Dick had a job with a regular paycheck coming in every month. Over the course of the next 7 years, Dick worked on prospects and Floyd bought and sold companies. The big step forward was the formation of the company to be called Petrohawk in 2003. As a start-up company, an initial capitalization of about $60 million was raised and the new company started working conventional plays in the Gulf Coast and in surrounding states.

Petrohawk's first exposure to shale gas plays came in 2006 when they acquired a company that owned about 15, 000 acres in the Fayetteville in Arkansas. That was the beginning of a steep learning curve that showed Dick and his associates what knowledge and skill sets were needed to succeed in developing viable shale plays.

The company had modest success in the Fayetteville, completing enough wells that Floyd Wilson decided to sell off the conventional production and use all the proceeds in looking for shale plays.

While enjoying moderate success in the Fayetteville, Dick and his exploration team were able to obtain in July 2007, core data from a vertical Haynesville shale well, located some 50 mi southeast of a large land block held in the Elm Grove Field by Petrohawk. The core data and subsequent regional geologic analysis encouraged them to spud a well with a Haynesville shale objective on their leasehold. That well flowed over 16 MMCFD and led to a multiwell program that found reserves of approximately 15 TCFG.

In January 2008, prior to the spud date for the initial Haynesville well, Floyd Wilson told Dick and his exploration team to go out and find another major prospect. That was the beginning of the Eagle Ford shale discovery. Dick had experience in the geology of southwest Texas and, during his survey for areas with undiscovered major shale potential, was surprised to find that the Eagle Ford was largely untested for shale reserves. He knew that a classmate at The University of Texas had worked for years as an independent in that area and had an excellent background in the region's geology and prior drilling activity. Dick and Greg Robertson began their evaluation of the Eagle Ford's potential by hunting for petrophysical logs that would show the reservoir quality of the formation.

They found a set of logs from a dry hole drilled in the early 90s that showed the Eagle Ford to have a high calcite content and excellent parameters for shale production. The next step was to attempt to acquire the geochemical data necessary to understand the thermal maturity, among other things, of the Eagle Ford. After a thorough search, a set of cuttings from a Phillips well drilled in 1952 was found in the sample library at the Bureau of Economic Geology at The University of Texas. This was a real eye-opener—the cuttings showed that the Eagle Ford at that location was in the gas condensate window and likely to be highly productive through horizontal drilling and fracturing.

Petrophysical and geothermal evidence was positive. The next and final step was to review existing three-dimensional seismic data to find the outlines of the potentially productive area. With all the data in hand and looking good, Petrohawk took the risky step of leasing some 160,000 acres before drilling their first test well. The initial test was spudded July 2008, and completed in October for 7.6 MMCFD and 251 BOPD. The time elapsed between receiving the challenge from Chairman Wilson to discovery of a mega oil and gas was an astounding 10 months!

Beginning with that discovery of the Hawkville Field, operations in Southwest Texas grew rapidly. According to published reports, the Eagle Ford Shale is possibly the largest single economic development in the history of the State of Texas. More than 200 rigs were running at the height of the play and oil production in September 2015, was 1,087,000 barrels per day. An analysis of the field by an independent consulting firm has estimated proven and potential reserves at 28 billion OEG.

The Eagle Ford shale, which was the source rock for the

5-billion-barrel East Texas Field, discovered in 1930, has thus been responsible some 88 years later for providing the largest oil and gas reserves ever found in the United States. That is an enormous credit to the creativity and exploration leadership of Dick Stoneburner. As a graduate of a major oil company with a staff of many top-notch geologists and geophysicists, I have experienced the long time frame usually involved in carrying out a major exploration play. To have an independent like Petrohawk conceive and successfully discover a historically major new reserve in such a short period of time is almost beyond reason!

As Ted Bear said many years ago, only the creative assembly of all the disparate bits of scientific knowledge can develop a prospect. An old electric log here, some long-forgotten well cuttings there. Throw in some available and pertinent seismic data and create something never imagined before. That's the challenge for petroleum geologists and that is the road to discovery that Dick followed.

In recognition of Dick's strong managerial ability, he was named Petrohawk's chief operating officer in 2007. Further recognition followed in 2009 when he was appointed president and chief operating officer.

In August 2011, BHP Billiton acquired Petrohawk and Dick assumed the position of president of the North American Shale Division for his new employer. He retired from BHP in December 2012. In April 2013, he joined Pine Brook Partners, a private equity firm based in New York and opened a Houston office for the firm in August 2013. His role initially was as a senior advisor and he was asked to join the firm as a partner in July 2014.

Dick has been a member of AAPG since 1977 and is also a member of the AAPG Foundation Trustee Associates. During the past several years, he has toured North America as a Distinguished Lecturer, presenting his thoughts and experience in exploring for commercial shale oil and gas projects. He was recently featured in a GeoLegends interview, conducted by Ed Dolly and Paul Weimer.

I know that Norm Foster would have been elated to honor Dick Stoneburner with the Outstanding Explorer Award. His exploration achievements are of the highest order and worthy of this prestigious award.

Lawrence Funkhouser

Response

I want to thank Larry Funkhouser for agreeing to take the time and make the effort to be my biographer. His kind words regarding my life and my career are appreciated and humbling. As well as being one of the most honored men in the history of AAPG, he has been a lifelong friend to my family and has been my stepfather for the past 7 years.

Larry mentioned that my father, Roger Stoneburner, was an extremely successful petroleum geologist and lifelong member of AAPG. He was a truly fantastic role model to me, not only in a professional sense but even more so in a paternal sense. I cannot put into words what a truly outstanding man my father was. I think it is worthwhile briefly describing his career because it was very noteworthy. Larry has referenced his early time with the California Company and that he made the decision to leave in 1955 and move the family to Houston. After several stops early in his time in Houston, Dad joined Union Texas Petroleum. He rose through the ranks and eventually became executive vice president of international exploration. Some of the more notable discoveries that he was involved in were the Piper and Claymore fields in the North Sea, which were truly basin opening discoveries at the time; the Badak field in Indonesia that was led by Roy Huffington and was also a frontier discovery; and a very successful exploration campaign in Pakistan that lead to a series of very commercial discoveries. However, even more important to me in terms of his legacy are the dozens upon dozens of people in the business that have commented to me in the 16 years since I have returned to Houston what a wonderful person and leader he was at Union Texas. It makes me proud to acknowledge, and agree with, their comments about what a great man he was.

The path of my career is one that while not entirely unique, I think it can be described as one that is certainly not typical. The fact that I have been chosen for this award can only be described as a result of perseverance, hard work, and more than a bit of very good fortune because while 10 years ago my career could have been described as successful, it was far from award winning.

Larry referenced another person that was instrumental to my success and one that had he not had the confidence in me as a geologist and as a manager I doubt I would be where I am today. That person is Floyd Wilson. I first went to work for Floyd at a very small company in Wichita in 1979. We had a very cohesive group of geologists that collectively found more than our share of oil and gas in Kansas and made Floyd's company quite successful. It was so successful that he was able to sell it in October 1985, which put me out of work. Many of our current younger geologists think that 2015 has probably been the worst of times in our business, but those of us that lived through 1986 and the succeeding years would beg to differ. I know that I went from 1986 through 1996 without a regular paycheck and as a result had to expand my role beyond that of a prospect generator. I became exposed to operational challenges for the first time in my career as well as the challenge of raising capital, the need to understand the land side of the business and the art of dealing with partners. While I did not know it at the time, those 10 years of true independence taught me a lot of skills that I would otherwise not have gained. Those skills truly aided me as my career progressed.

The real part of the Floyd Wilson story began in 1999 when we started 3TEC Energy, which we merged into Plains Exploration in 2003, and when we started Petrohawk in 2003, which we merged into BHP Billiton in 2011. I can't begin to describe the feelings that I have as I look back on that 12 years of my life and all that I learned and accomplished, and much of that is a direct result of Floyd's vision as an entrepreneur and a leader. He provided me the opportunity to build an industry-leading geologic staff including Charles Cusack, Clif Naylor, Tom Smith, Scotty Tuttle, Jana Beeson, and many, many more that made me look better than I probably am. It was a pleasure to lead and manage such a talented group of people through that time and enjoy the many successes we had, both conventionally and unconventionally.

Speaking of unconventional, it would be an understatement to say that my involvement in much of the early shale exploration is why I am receiving this award. The key to that statement is my involvement, not my success. As I have made a point of emphasis every time I have spoken publicly about our company's success in shale exploration and development, the team nature of working shale plays is so much more critical to being successful than it ever was in conventional exploration. Large scale shale plays require an almost unbridled aggressiveness while at the same time being able to assess the results in a real time manner that involved every discipline pulling together: land, legal, geology, petrophysics, geophysics, drilling, completion, and production. And when all of that is working in harmony, or at least as harmonious as possible, then the result is what we accomplished at Petrohawk. If my success can be boiled down to one element it was my ability to manage all of those disciplines in a way that created a unique environment to work and to succeed, and succeed we did.

There is one other individual that needs special commendation in terms of this award and the success of Petrohawk in the Eagle Ford shale. His name is Gregg Robertson. I first met Gregg in the late 80s when we both were working the Austin Chalk trend, specifically the horizontal boom that was the Pearsall field in Frio, LaSalle, and Dimmitt Counties. We became good friends, both personally and professionally, and we continued that relationship for almost 20 years to the time that we generated the concept of the Eagle Ford shale being a thermogenic shale reservoir in early 2008. Floyd had challenged our exploration team to find another shale play after we had begun to put the Haynesville play together. At about the same time Gregg had come to our group and suggested that we study the Eagle Ford together, knowing it is a world-class source rock and a section of rock that he and I had both drilled many times during our time working the Cretaceous

trend. Gregg has always been, and still is, a straight up partner and he simply asked that he and his associates (the primary one being another good landman friend of Gregg and mine, Burke Edwards) maintain a 10% interest in the play should we succeed in putting one together. I think Larry has accurately described the process that our team undertook to identify the resource and acquire the asset so I think it only needs to be said that the "rest is history."

Thanks again to the Executive Committee for considering me for this award. It clearly represents the most rewarding and humbling experience of my career. I can only hope that my efforts truly represent all that the Norman H. Foster Outstanding Explorer Award stands for.

Richard Stoneburner

MICHAEL D. LEWAN
Robert R. Berg Outstanding Research Award

Citation—To Michael Lewan, whose passion to understand the origin and expulsion of petroleum has resulted in a quantitative understanding of factors controlling timing and extent of petroleum formation, petroleum charge, and petroleum types and quality.

Born and raised in Chicago, Mike was well-rounded, lettering three times playing varsity football, active in Chemistry Club (this was prescient!), Drama Club and a drummer in his 60s rock-n-roll band.

After graduation, Mike attended Northern Illinois University and declared geology as his major. He was fortunate in having Sam S. Goldich as his mentor, through whose mentorship he became totally impassioned with geochemistry—a passion that continues to this day.

Mike graduated with a B.S. degree in January 1971, and attended Michigan Technology University for his initial graduate studies. The field and laboratory skills he refined there have served him and our profession well. Mike graduated with a M.Sc. degree in June 1972 and joined Shell Oil Company in their New Orleans Offshore E&P office as an exploration geologist.

At Shell, Mike became interested in the composition of recently discovered oils on the Gulf of Mexico shelf edge. Intrigued by a paper on the use of vanadium, nickel, and sulfur in characterizing sources and migration of Iraqi oils, he observed that the shelf-edge Tertiary oils appeared to be similar to the Smackover oils of southern Arkansas and northern Louisiana.

In January 1975, Mike left Shell and took a research position at the Amoco Production Company Research Center in Tulsa. Through the amazing mentorship of John C. Winters, Robert Thompson, Jack Williams, and James Momper, Mike's education in organic geochemistry flourished. John was most magnanimous in offering Mike a leave of absence to attend graduate school for his Ph.D. at the University of Cincinnati. The only stipulation was that he had to work at least two months each summer at the Research Center.

In September 1975, teaching assistantship in hand, Mike started his Ph.D. graduate coursework and research in the Geology Department. The topic of his dissertation was the geochemistry of vanadium and nickel in sedimentary organic matter. He was the recipient of the 1977 Fenneman Research Fellowship at the University of Cincinnati.

During the summer of 1977 at Amoco, John Winters asked Mike to work on experiments using water and source rock in some old recertified Parr reactors. These early experiments involving John, Jack Williams, and James McDonald were the start of the pioneering effort now referred to as hydrous pyrolysis. In 1979, Mike with coauthors Winters and McDonald published a paper in *Science*, showing that pyrolysis of Woodford Shale in the presence of water generated an expelled oil that was similar in molecular

and isotopic composition to natural crude oils. This finding was in contrast to anhydrous pyrolysis methods that obtained petroleum products by solvent extraction or vaporization.

Mike left Cincinnati in November 1978 with his bride, Jeannie, and returned to Amoco. He continued his hydrous pyrolysis experiments and writing his dissertation, which was defended in June 1980.

Mike's experiments revived the previously noted concept that oil is not directly generated from kerogen, but rather bitumen is an intermediate phase that must be considered in evaluating petroleum formation. This was clearly demonstrated in hydrous pyrolysis experiments along with the important effects of kerogen-sulfur content on the timing of oil generation. These results were published in the *Transactions of the Royal Society* and received the 1985 Best Paper Award from the Organic Geochemical Division of the Geochemical Society.

A petrographic study of immature Woodford Shale taken to different thermal maturities by hydrous pyrolysis showed the importance of the volume increase in organic matter associated with oil expulsion, and gave experimental support to James Momper's concept that oil expulsion was a consequence of its generation. Mike received the 1987 George C. Matson Memorial Award for Best Paper and was a selected as a 1991-1992 AAPG Distinguished Lecturer. In 1991, Mike joined the Oil and Gas Branch of the US Geological Survey to start an experimental research program on petroleum issues. More than 40 researchers from 11 countries, including this fortunate scribe have worked with Mike on various petroleum issues. He has authored/coauthored 77 papers resulting in more than 4,400 citations!

Mike has also transferred his knowledge via the classroom. He and fellow volunteer adjunct professor Paul Lillis taught an acclaimed graduate petroleum geochemistry course with me at the Colorado School of Mines for many years. Mike is a natural, caring teacher—and I have benefited from our collaboration and much-valued friendship for the last two decades.

Mike retired from the US Geological Survey in June of 2014, but continues doing experimental research at the USGS as an Emeriti. Fittingly, RMAG awarded Mike their Outstanding Scientist Award in 2014.

John B. Curtis

Response

I am most gratefully for being honored with the 2016 Robert R. Berg Outstanding Research Award. I especially want to thank the petroleum industry for making my research efforts relevant, but more importantly for its enormous contributions to moving the earth sciences forward. Although petroleum is a significant component to the world economy, exploration and extraction of this natural and organic substance has provided earth scientists with an immense amount of subsurface information on sedimentary basins and our Earth's crust. I am unaware of any other group or industry that has added so much to our understanding of the Earth's crust, and moved the earth sciences from speculative hypotheses to tested theories.

Although subsurface data continues to become available, it remains limited within the vastness of sedimentary basins in which organic and lithologic facies of source rocks typically change. These limitations in subsurface data can be abridged in part by simulating petroleum formation to the best of our ability by laboratory pyrolysis. In this way, variables can be minimized and controls can be unequivocally established. It is within this context that my experimental pyrolysis efforts concerning the origin of petroleum and the factors that control its formation have been focused. There are rapid programmed open-system pyrolysis methods that provide screening data useful in identifying effective source rocks and their overall potential to generate petroleum. However, generating and collecting petroleum products from these methods are not similar to natural petroleum processes. In the mid-1970s, the inclusion of water in pyrolysis experiments (i.e., hydrous pyrolysis) astonished the Geochemistry Group at the Amoco Production Company Research Center in Tulsa. Source rocks submerged

in water during pyrolysis generated and expelled an oil that accumulated on the water surface. This floating oil was similar in physical, molecular, and isotopic traits to natural crude oils. Unlike programmed open-system pyrolysis, hydrous pyrolysis differentiated the various organic phases (kerogen, bitumen, oil, gas, and organic acids) used to define stages of petroleum formation.

I am indebted to John C. Winters at the Amoco Production Company Research Center in Tulsa for mentoring and giving me the leeway to further develop hydrous pyrolysis as a research tool to better understand the origin of petroleum and the factors that control its formation. During this time, the role of water was intensely scrutinized, which led me to conduct a wide array of experiments to assess the role of water. Conditions of these exploratory pyrolysis experiments included evacuated and pressurized dry systems, varying water salinities and pH, replacement of water with D_2O, different water to rock ratios, saturated and unsaturated steam systems, and substituting water with a Ga-In alloy. The end result was that water played a critical role in the generation of oil and in facilitating its expulsion. In addition to the good fortune of having John C. Winters as a mentor, James A. Momper and Jack A. Williams in Tulsa also provided me with invaluable mentoring on expulsion and petroleum chemistry, respectively.

My research using hydrous pyrolysis continued at the US Geological Survey in Denver, where a multitude of collaborative studies emerged on evaluating and better understanding thermal maturity effects on vitrinite reflectance and stable isotopes, petroleum-generation kinetics, stages of petroleum formation, expulsion efficiencies and petroleum charge, programmed open-system pyrolysis data, organic carbon limits for source rocks, thermal stability of biomarkers, retained versus generated petroleum in source rocks, utility of geochemical correlation parameters, changes in rock properties with maturation, and quality of petroleum generated from source rocks. Results from these studies were always applied and integrated with available subsurface data. When results were not as expected, they were attributed to either an artifact of the higher temperatures and shorter times inherent in all pyrolysis methods, or a new insight that previously was not recognized. Regrettably, there are too many collaborators to mention individually, but they all brought to the lab new perspectives, analytical capabilities, and issues to be tested. This greatly enriched the research program at the USGS and broadened our knowledge base on the origin of petroleum.

The importance of water in petroleum formation initiated a link between organic and inorganic geochemistry. Inorganic geochemistry was my earliest passion cultivated in my undergraduate studies by Sam S. Goldich at Northern Illinois University and heightened during my graduate studies by Albert P. Routsala at Michigan Technology University and J. Barry Maynard, Attila I. Kilinc, Wayne A. Pryor, and John E. Grover at the University of Cincinnati. Much of my early learning from these mentors was used in studies involving organic acid generation of secondary porosity, interaction of petroleum formation with silica and clay-mineral diagenesis, evaluation of Re-Os and K-Ar dating of source rocks, and transition-metal catalysis in gas generation. Critical to all these geochemistry studies is an acumen in field practices and rock descriptions instilled in me by Wayne A. Pryor, Paul E. Potter, and Roy Kepferle at the University of Cincinnati.

In addition to my experimental pyrolysis research, I have enjoyed other geochemical research including identifying sources of Egyptian mummy bitumen, oil losses during the Deepwater Horizon oil spill, outcrop weathering of source rocks, concentration of V and Ni in oils and source rocks, and petrography of fine-grained sedimentary rocks.

I also attribute the breadth and accomplishment of my research at the USGS to the outstanding analytic expertise of Augusta Warden, Charles Threlkeld, David King, Zach Lowry, Mark Dreier, Tammy Hannah, and the late Ted Daws, and to the scientific savvy of my USGS

colleagues and collaborators, Paul Lillis, Debra Higley, Bob Dias, Justin Birdwell, Geoffrey Ellis, Mark Pawlewicz, Charles Barker, James Palacas and the late Leigh Price. I am also indebted to Gene Whitney and Christopher Potter whose tenure as directors of the USGS Central Energy Resources Science Center accentuated the importance of science and supported my research.

Most importantly, I am indebted to my wife, Jeannie, for her support over the last 37 years and my two sons Ryan and Brett who all made the transition from an industrial position in Tulsa to a government position in Denver. I have learned from Jeannie, Ryan, and Brett that there is more than one way to look at things, which is an important tenet to develop in life and research.

Michael D. Lewan

QUINN R. PASSEY
Robert R. Berg Outstanding Research Award

Citation— Dr. Passey has distinguished himself with several advancements in the field of petroleum geoscience. Whether at the laboratory, logging truck, field outcrops, or classroom, Dr. Passey exemplifies the best in geoscience research applied to safe, effective, efficient, and environmentally sound exploration and production.

Quinn Passey has proven himself, over the course of more than three decades, the kind of innovator and enthusiastic proponent of research and technology application for which the Berg award was founded. Dr Passey has distinguished himself with several advancements in the field of petroleum geoscience, that include his work on well-log geochemistry, thin-bed petrophysical analyses, and high-angle and horizontal well formation evaluation. All of these have been applied extensively in exploration, development, and production of both conventional and unconventional petroleum resources.

Passey's work on the well-log geochemistry, as a leader, technical expert, and educator clearly demonstrates a new approach to solving a problem that lead to the development of a new methodology that is widely known as Delta Log R. This method has been used within Exxon and ExxonMobil since the early 1980s and throughout the petroleum industry since its publication in 1990 in the *AAPG Bulletin*, originally in the evaluation of hydrocarbon source rocks, and more recently, in the assessment of unconventional reservoirs. For example, the Delta Log R method was fundamental to the approach of the British Geological Survey-Department of Climate Change and Energy's recent assessment of the potential of several onshore basins in the United Kingdom (Andrews, I.J. 2014. The Jurassic shales of the Weald Basin: Geology and shale oil and shale gas resource estimation. British Geological Survey for Department of Energy and Climate Change, London, UK). Another novel methodology to which he contributed significantly was the development of a source-rock detection method that uses remote resistivity detection (CSEM) integrated with seismic velocities and seismic stratigraphy and facies, a kind of remote Delta Log R, for which a patent was awarded (Srnka et al., 2009, Method for remote identification and characterization of hydrocarbon source rocks using seismic and electromagnetic geophysical data, US Patent 8,729,903).

Passey has also excelled in the application of existing theories, concepts, approaches, methodology or technology to increased exploration or production of hydrocarbon resources. He was a key leader in using and promoting detailed well log analysis, integrated with fundamentals of sedimentology and stratigraphy to generate useful insights into nature and distribution of mudstone (shale

reservoirs), leveraging decades of previous collaborative work on hydrocarbon source rocks and extending and expanding those principles to unconventional fine-grained reservoirs. He was lead author on an SPE paper that presented the extension of source-rock studies to shale gas reservoirs that is one of the most downloaded and cited references in the field of mudstone reservoirs (Passey et al., 2010 From oil-prone source rock to gas-producing shale reservoir—geologic and petrophysical characterization of unconventional shale-gas reservoirs, SPE 131350). He was a key co-author on a subsequent paper that extended this work into the realm of shale-oil/tight-liquid reservoirs (Bohacs et al., 2013, The spectrum of fine-grained reservoirs from "shale gas" to "shale oil"/tight liquids: Essential attributes, key controls, practical characterization, 2013, IPTC 16676) that is also widely cited.

He has been awarded four patents, one of which was a precursor of work done to produce oil directly from source rocks (Passey et al., 1999, US Patent 6,918,444), and one for converting oil shales to liquids (Symington et al., 2000, US Patent 7,331,385 B2). Another patent was part of his efforts to assist the industry in developing standards for evaluating unconventional reservoirs (Sinha, et al., 2011, US Patent 9,091,622 B2).

Passey is an active member of several professional societies: AAPG, American Geophysical Union, Society of Petroleum Engineers, Society of Professional Well Log Analysts, Houston Geological Society, presenting numerous papers and short courses over the years (his non-ExxonMobil publications include 1 book, 21 papers, 48 abstracts/posters/extended abstracts, and 2 cover photos).

In testimony of his many research advances and contributions, he has earned many prestigious awards from those societies, and across the petroleum geology profession, starting in 1991 when he was selected as SPWLA Distinguished Speaker (Source Rock Evaluation from Logs), an honor repeated twice in subsequent years: 2004-2005 (Thin Bed Petrophysical Evaluation) and 2005-2006 (High Angle and Horizontal Well Formation Evaluation). His other awards are ones for technical achievement, excellence in communication and teaching, and meritorious service to professional organization, including AAPG EMD Best Paper (2011) and AAPG Distinguished Lecturer (2012).

In fine, what distinguishes Quinn Passey is the way he combines his deep technical knowledge, creative innovation, relentless pursuit of practical applications, and enthusiastic and effective teaching. He particularly excels in collaborating across a broad range of disciplines (especially if it means time on the outcrop) and incorporating the insights he gains in novel ways. Whether at the laboratory, logging truck, field outcrops, or classroom, Passey exemplifies the best in geoscience research applied to safe, effective, efficient, and environmentally sound exploration and production.

Kevin M. Bohacs

Response

I am honored and pleased to receive the Berg Outstanding Research Award. I have been a researcher for most of my career, from university through 33 years in industry. My graduate research at CalTech addressed a variety of topics from discovery of Earth-crossing asteroids, formation of multiple crater fields on Earth, Mars, and Venus due to atmospheric breakup of meteoroids, understanding isostatic rebound of basins and craters on Earth, and on the icy moons of Jupiter and Saturn. My industry research ranged from well log analysis of source rocks, quantification of in-place hydrocarbons in thinly bedded reservoirs, evaluation of high-angle and horizontal wells, and finally to understanding how to determine hydrocarbons in nano-meter scale pores in organic matter.

While still in elementary school, my father purchased a 6-in. telescope, and it initiated my interest in astronomy and science. A few years later, I became acquainted with Gordon Dixon who taught astronomy at a local junior college; I took my first college course (astronomy) when I was in the 8th grade, and later worked as Dixon's "lab assistant" at the college after school and summers through

high school. I had access to their 24-in. telescope, which gave me a bit of an unfair advantage in high school science fairs.

My interest in astronomy shifted into a passion for geology during my undergraduate years at Brigham Young University, which is located within a 1-2 hour drive to the Rocky Mountains, the Great Basin, and the Colorado Plateau. When considering graduate schools, I still had a strong interest in astronomy, and I decided to go to the California Institute of Technology where I could study planetary science and geology.

At that time, geoscience graduate students were required to work three research projects during their first year with three different professors; I worked a Lake Bonneville Basin isostatic rebound project with Kerry Sieh, a meteoroid-breakup project with H. Jay Melosh, and a Voyager Spacecraft cratering study of two of the icy moons of Jupiter (Ganymede and Callisto), and one icy moon of Saturn (Enceledus) with E. M. (Gene) Shoemaker. All of these projects were published in various journals/books, and I learned how real research is conducted and documented. Gene Shoemaker ultimately became my Ph.D. advisor, and I learned much from him about precise writing for technical papers, as well as the value of enthusiastically exploring the unknown. I had opportunities to work with many scientists at the Jet Propulsion Laboratory (including Elenor "Glo" Helin), and I spent many nights at Palomar Mountain Observatory, where I discovered my first earth-crossing asteroid with Bobby Bus; later, I worked with Caroline Shoemaker (Gene's wife) in discovering a couple of additional asteroids before my graduate years ended.

I had always planned to go into university teaching as a career, but about four months before I completed my Ph.D., I had an informal discussion with the Exxon recruiter Danny Horowitz. At that time Danny was an amateur astronomer and we visited long into the night about the recent Voyager Spacecraft discoveries (1979-82). He asked me if I had ever considered working for an oil company, which I had not, and he suggested to me to fill out an application. A couple of weeks later, I received an invitation to visit Exxon Production Research Company (EPR) in Houston, and shortly thereafter, I received a job offer in their newly formed Rock and Fluid Properties research group. It was scary to shift from an academic focus to the oil industry, but by then I was comfortable in a research environment, and there was a lot in petroleum geology that could be studied. I thought that if I didn't like industry research, I could always go back to academia.

Prior to Exxon, I had never heard of well logs, and yet my first assignment (and ultimately my 33-year career) was in petrophysics, and I learned from many colleagues, including Dan Georgi, Dale Fitz, Mike Payne, Richard Felder, Hezhu Yin, Ken Dahlberg, David Kennedy, Shin-Ju Ye, and many others in industry. Also, I was exposed to state-of-the-art concepts in sequence stratigraphy, and worked with renowned geologists and geochemists including Kevin Bohacs, Stephen Creaney, John VanWagoner, Peter Vail, Henry Posamentier, Kirt Campion, Victor Rahmanian, and others.

After 6 months at EPR, I began working on a research project with colleague, friend, and geochemical mentor, Stephen Creaney where we built upon observations from previous researchers (Frank Moretti, Jean Kulla, and John Stroud) to identify and quantify source rocks using well log data. This work was done in the early 1980s, but we did not publish (in *AAPG Bulletin*) until 1990, after this technology was starting to "leak out" into industry.

In the early 2000s, I worked on another research project on producing hydrocarbons directly from source rocks. This was a return to work I had done 20 years prior, and I greatly benefited from engineering insights from colleagues Michele Thomas and Bill Symington. Later, I got involved in evaluation of "unconventional shale-gas" reservoirs worldwide, and benefited from the collaboration with Kevin Bohacs, Mark Rudnicki, Somnath Sinha, Bob Klimentidis, W. Lee Esch, among others. These were very exciting times with an entirely

new hydrocarbon resource type—organic-rich mudstones—something that I had been familiar with since the early 1980s.

I am probably one of the few people who worked for one (albeit very large) company for an entire career. I am grateful that my company supported my research and publication of some of the results in the open literature. I have been very fortunate to have collaborated with very creative individuals and enthusiastic teams. Finally, I am grateful to my wife, Debbie, who has been with me since my undergraduate years, and to my son, Sam, who continues to remind me that I "talk too much" and that I should return to academia now that I retired. Thank you AAPG for this award.

Quinn R. Passey

ABDULKADER M. AFIFI
Distinguished Service Award

Citation—To Abdulkader M. Afifi in appreciation for two decades of continuous service to the AAPG and its Middle East Region, and for his life-long dedication to the science and profession of geology.

Abdulkader ("Aboud") Afifi has completed 20 years of continuous service to AAPG in many roles. He initially served as a member of the Arab world network (1996–2001), then following the establishment of the Middle East Region, he served it as observer (2002–2005), president-elect (2003–2006), and president (2006–2009).

Under his leadership, the Middle East Region accomplished several firsts including establishment of an AAPG local office in the region; establishment of student chapters at universities in Saudi Arabia, UAE, and Lebanon; participation of local student chapter in the Imperial Barrel competition; establishment of an AAPG-affiliated society in Qatar; bringing AAPG training to the Middle East; exchange of visiting lecturers among local societies; and election of regional officers and engagement of members and young professionals from different countries in AAPG activities.

He also served the association as a member of the Grants in Aid Committee (1999–2001), as a member of the Advisory Council (2002–2005), and as a Distinguished Lecturer (2003–2004). He has been active in several AAPG international conferences as speaker and session chair, and co-chaired the technical program for 2014 ICE in Istanbul with Pinar Yilmaz. He also served as session chair in two AAPG GTW workshops: AAPG/SEG Exploration of Subsalt Structures in Rift Basins Workshop in 2013, and Hydrocarbon Potential of the Sinai Microplate in 2016. Abdulkader also served on the organizing committees of the biennial GEO conference between 1996 and 2008, and promoted AAPG's role in organizing this conference. He also served from 2004 until 2015 as associate editor of *GeoArabia*, the leading journal of petroleum geosciences in the Middle East.

Abdulkader was born in 1957 in Jerusalem, however he grew up in Saudi Arabia, which generously embraced him and gave him his home, citizenship, and higher education. His interest in science and geology started at Brummana High School in Lebanon, and was stimulated by the Apollo lunar landing in 1969. He initially studied geology in Saudi Arabia at the University of Petroleum and Minerals, from which he graduated with highest honors in 1977. He was fortunate to work during summer vacations with the US Geological Survey (USGS) Mission in Saudi Arabia, which brought him under the influence of outstanding field geologists and deepened his interest in geology. He completed his M.Sc. at the Colorado School of Mines in 1980; his thesis project was mapping stratigraphy and structure of Precambrian rocks in Colorado, advised by Professor Rudy Epis. Abdulkader was

hired by the USGS Mission to work on the Mahd Adh Dhahab gold discovery, and this became the subject of his Ph.D. research at the University of Michigan, Ann Arbor, advised by Bill Kelly and Eric Essene, and Robert O. Rye of USGS. Abdulkader met his wife and life-long companion, Kathy Ann Breining, in Michigan and together they raised two wonderful daughters.

Abdulkader's career in the oil industry started in 1991 when he joined the Saudi Arabian Oil Company (Saudi Aramco). He quickly learned petroleum geology, mostly from interaction with several excellent geoscientists at Aramco, and subsequently held technical and managerial positions in the Area Exploration, Upstream Ventures, Reservoir Characterization, and Technical Services departments.

He played leading roles in discoveries of nonassociated gas and the creation of gas exploration joint ventures. He significantly contributed to the understanding the Paleozoic stratigraphy and hydrocarbon habitat in the Arabian Plate. In collaboration with Geert Konert of Shell, he published a paper of this subject in AAPG Memoir 74. More recently, he focused on understanding the geologic evolution of the Red Sea and mentoring of young geoscientists. Abdulkader's other accomplishments include establishment of a continuous geosteering operations center and evaluation of geothermal energy potential and earthquake hazards in Arabia.

Abdulkader remains passionate about field geology, and continues to lead field trips for research and training. He is regarded as an authority on the regional geology of the Middle East, and has coauthored papers on diverse topics such as telluride minerals, impact structures, and rift structures in the Red Sea.

Moujahed Al-Husseini

SA'ID AL-HAJRI
Distinguished Service Award

Citation—For sustained contributions to petroleum geoscience, leadership, and outreach to future geoscientists that promote the globalization, diversity, and success of AAPG.

Sa'id Al-Hajri was born and raised in Dammam in eastern Saudi Arabia. He spent his childhood helping his father run the family business, where he developed interpersonal skills rooted in hospitality, honesty, trust, and vision for the future.

Sa'id was a star in science and literature in his early schooling. He represented his schools in many competitions, in one such contest appearing on national television! Sa'id focused on math and physics in high school, but his passion for exploring the outdoors drew him to geology in college. Sa'id still spends many winter weekends exploring the deserts of Saudi Arabia. He is an avid naturalist, author, and co-author of articles on the archaeology of Saudi Arabia, and volunteer in digs and environmental protection campaigns.

Sa'id received his B.Sc. in geology from King Fahd University of Petroleum and Minerals in Dhahran and his M.Sc. in geosciences from Pennsylvania State University. He began his career with Saudi Aramco as exploration geologist, received Saudi Aramco's highest technical award for exploration in 1992, and progressed to group leader, chief geologist, and chief explorationist before assuming his current role as manager of the Exploration Technical Services Department. Sa'id has authored or coauthored more than 20 refereed scientific papers. Along the way, he furthered his education with an M.B.A. degree from Hull University, United Kingdom, and the Program for Executive Development at IMD International in Lausanne, Switzerland. Sa'id is also a board member of Lukoil Saudi Arabia Energy Limited (LUKSAR).

Sa'id has contributed steadily to AAPG, the Middle East Region, and the Dhahran Geoscience Society (DGS) through service as DGS

2004-2005 Professional Development chairman, 2006 DGS president, 2013-2015 Middle East Region president, and 2015-2017 Visiting Geoscientist Program coordinator for the Middle East Region. During his second year as Region president, Sa'id hosted AAPG president Lee Krystinik and AAPG executive director David Curtiss on a tour of the Middle East Region in conjunction with the 2014 IPTC meeting, including geology field trips in the world's largest sand sea in the Rub' al Khali (Empty Quarter) of Saudi Arabia and the sabkhas of Abu Dhabi. He hosted AAPG president Randi Martinsen on her visit to the GEO 2014 conference in Bahrain. Sa'id was instrumental to the success of GEO 2014 and an active member in the GEO 2016 executive committee. He co-chaired the highly successful AAPG ICE 2014 in Istanbul cohosted by the Middle East and European Regions.

In addition to AAPG, GEO, and IPTC, Sa'id has been vital to the initiation of the Lebanon International Petroleum Exhibition, the Northern Arabia Conference, and collaboration with SEG, EAGE and SPE.

Perhaps most important is Sa'id's work in nurturing the aspirations of future geoscientists. He spearheaded an outreach program that included university visits to engage students, faculty, and corporate executives in Abu Dhabi, Jordan, Kuwait, Oman, and Saudi Arabia. Sa'id is encouraging younger students to study geology by working to include geoscience in the high school curriculum. Through his longstanding membership of Toastmasters, he exemplifies excellence in communication and leadership by reaching out towards young professionals. Behind the scenes, Sa'id plays an important role in encouraging young professionals to join, volunteer, and conduct themselves according to the standards of AAPG.

Sa'id Al-Hajri has been a dedicated volunteer and judge for the Imperial Barrel Award (IBA) program for years, both for the Middle East Region and for the global finals. His eloquent remarks at the 2015 IBA awards ceremony in Denver resonated with the international audience. In his words, "This program is definitely a fantastic training ground for young talent and will surely produce a special breed of geoscientists equipped with the right knowledge, the right attitude, and the right experience."

Sa'id has changed AAPG for the better by diversifying the Middle East Region Council to better serve all parts of the Region, by implementing annual business and strategic plans to ensure that the Middle East Region meets goals for AAPG and for dissemination of petroleum geoscience, by improving the development of Geosciences Technology Workshops for the Middle East Region, and by launching the Middle East Region Awards.

Sa'id's personal characteristics endear him to his fellow AAPG members and the AAPG staff. Sa'id is unfailingly polite and modest, delivers on his commitments, and treats everyone with respect. He is passionate about geology, education, and making the world a better place.

Through these activities, AAPG will survive the "crew change" and emerge with a diverse supply of talented geologists. Therefore, it is appropriate to recognize Sa'id Al-Hajri with the Distinguished Service Award.

Gretchen M. Gillis

PAUL J. ENGLISH
Distinguished Service Award

Citation—To Paul J. English, for his long-term dedication to the growth of the Canada Region, the House of Delegates, and the AAPG.

I met Paul as an AAPG Canada Region delegate. Paul had already been serving AAPG as a delegate for at least 10 years and was one of the "pioneers" involved with the founding of the Canada Region and drafting its original bylaws. Paul's historical

Canada Region knowledge has always been an asset to AAPG members and what most impresses us about Paul is his modest, knowledgeable, and well thought-out responses when the delegates are wondering "what we should do next?" regarding Canada Region AAPG business. His intelligence, willingness to serve, and desire to ensure recognition of deserving Canadian AAPG members has always stood out amongst fellow AAPG colleagues.

Paul was born and grew up in Bristol, England, in an area of classic Carboniferous limestone outcrops and a history of coal mining. This, combined with family holidays to Wales and southern England, helped him develop an interest in landscape and physical geography.

His formal education in geology started at the relatively early age of 13 at Bristol Cathedral School. Class scheduling meant he had to give up Latin but this seemed a small price to pay for the subsequent five years studying geology, instilling the desire to pursue geology at university. Paul went on to study at the University of Southampton where excellent teaching and field trips to classic localities in Cornwall, Anglesey, and what is now called the Jurassic Coast provided a solid foundation in all aspects of the science. He became particularly interested in economic geology, in its broadest sense, and on completion of his bachelor's degree decided to continue his studies in Canada.

This resulted in moving to Edmonton, Alberta, in 1975 and starting a master's degree at the University of Alberta. His research thesis was on gold deposits within the metasediments of the Slave Craton, but his main interest was in continuing to learn as much as possible about all areas of geology through taking as many classes as feasible. It was also at this time that Paul further developed his interest in music, particularly opera, largely through the many social interactions of the Departments of Geology and Music (which had nothing to do with the music of stones but was not entirely unrelated to the fact that, at that time, one department was predominantly male, the other female).

While a possible Ph.D. and an academic life beckoned, Paul decided to follow some of his U of A friends and fellow Brits to the oil patch and in late 1981 started work for Texaco Canada Resources in Calgary. This turned out to be a very fortuitous decision as working for Texaco provided grounding in both the scientific and business aspects of petroleum exploration and development where the financial consequences of your recommendations were always a consideration. Paul started working with a focus on the Cardium, Nisku, and Leduc. Later exploration work covered the Beaufort-Mackenzie Basin, the Arctic Islands, and mainland Northwest Territories.

It was while at Texaco that Paul had the opportunity for a foreign assignment. What was expected to be just a few months turned into 15 months based in Cairo. This proved to be a great experience both technically and culturally, largely thanks to chief geologist Martin Sirovs, and resulted in a lifelong affection for Egypt, its people, and its history.

Returning to Calgary he continued at Texaco (becoming Esso Resources Canada after a takeover). Subsequently Paul spent 3 years at Murphy Oil Canada, 5 years at Landmark Graphics Canada and then in 2002 moved to Nexen Energy, a CNOOC Limited Company. After 14 years there he continues to find great satisfaction in assisting others to get the most out of the software they use.

Paul has also volunteered throughout his adult life. He started volunteering for the Canadian Society of Petroleum Geologists in the early nineties for the Publication Sales Committee, which played a key role in promoting AAPG publications in Canada. This eventually led to Paul serving as an elected AAPG Delegate in 1995. Paul was closely involved with the establishment of the Canada Region and, with others, spent many hours drafting the original bylaws. He has also represented the Region as an Advisory Council member and has served on a variety of House of Delegate committees.

Paul is humble about his impact on AAPG in Canada but has made ongoing, significant contributions. He is well deserving of this award and I,

along with many other Canada Region members, wish to congratulate Paul on years of exceptional service to the AAPG.

David Dolph

PETER HENNINGS
Distinguished Service Award

Citation—To Peter Hennings for his leadership and enthusiasm in the fields of petroleum structural geology and geomechanics and for his dedication to applied research and teaching.

Peter is a structural geologist who loves to work in all of the applied areas that can keep a structural geologist busy. Peter is a research scientist at The University of Texas Bureau of Economic Geology where he is a principal investigator in the Center for Integrated Seismicity Research and a lecturer in the Department of Geological Sciences. Peter is a consulting professor in Geophysics at Stanford University where he works with the Crustal Stress Group on topics of geomechanics and he maintains an adjunct professorship in the Department of Geology and Geophysics at the University of Wyoming where he teaches short courses and leads field seminars.

Peter's main technical interests include petroleum and seismic structural analysis, reservoir geomechanics, induced seismicity, and geology of the Laramide Rockies. Peter has a passion for teaching and has taught more than 200 field seminars and classroom courses on seismic structural analysis, reservoir geomechanics, and Rocky Mountain structural and petroleum geology.

Born and raised in Dallas, Peter was inspired by his St. Mark's high school astronomy/geology teacher to pursue geology. During his B.S. studies at Texas A&M University he worked as a geophysical field assistant in Big Bend National Park where the geological splendor of that region became part of his DNA. He also worked as a field assistant in the thrust belt of Montana where, over beers with John Spang, he decided to become a structural geologist. He stayed on for an M.S. at A&M to work with John on the structural geology of Wyoming's Bighorn Mountains. From there he went to The University of Texas for a Ph.D. to work with Bill Muehlberger on the structural geology of northeast Mexico and West Texas.

In 1990, Peter joined the petroleum industry via Mobil Oil's Research and Technology division where he worked on research and global exploration and producing projects. It was there that he gained an appreciation for the power of working across scales from the reservoir to the tectonic system. In 2000 Peter moved to Phillips Petroleum and then ConocoPhillips and continued this same thread where he served as a research scientist and formed COP's Structure and Geomechanics group which he managed until his retirement in 2015.

Peter strives to assist AAPG in its science and outreach mission, especially as it pertains to his discipline area. In 2000 Peter won the AAPG Levorsen Memorial Award for best sectional paper and he then won the AAPG Matson Memorial Award in 2015 for best annual conference paper. Peter was an AAPG Distinguished Lecturer in 2001-2002. He was the convener for the 2008 AAPG Hedberg Conference on fractured reservoirs and he then served as the editor for the special *Bulletin* issue that stemmed from the conference. He served as *Bulletin* associate editor 2002-2006 and then again 2013-present. Peter was an ACE Organizing Committee Theme chair in 2012, 2015, and 2016. Peter served on the Research Committee from 1997 through 2014 and was its chair 2010-2013. Peter, along with Steve Laubach, was active in organizing and promoting the AAPG Reservoir Deformation Research Group from its inception in 1997 through to its transformation into the AAPG Petroleum Structure and Geomechanics Division, for which Peter served is its first Chair 2013-15.

We thank Peter for his service to the association and his structural geology discipline and we look forward to working with him in the future.

Julia B. Hennings

ARTHUR H. JOHNSON
Distinguished Service Award

Citation—To our friend and colleague Arthur H. Johnson for the AAPG Distinguished Service Award. Art is a high energy individual who gives his all to his ventures including service to AAPG (in particular the EMD), Affiliates, and his local Geosciences Community. He has an intense interest in gas hydrates, their formation, geo-hazards to the drilling industry, potential recovery as an energy source, and potential effects on the environment via climate change. He continues to share his love of geosciences with academia, K-12 schools, and other interested groups. When asked why he was giving away so much of his time, he responded "it's what we geologists should be doing".

Art was born in Richmond, California, San Francisco Bay Area. He attended high school in Southern California (Arcadia). He obtained his undergraduate degree from Humboldt State University, Arcata, California and graduate studies at LSU. Following his graduation from Humboldt and LSU, he went to work for Gulf Oil Corporation, which later merged with Chevron. He rose through the ranks to become a division geologist. In 2001 following his career with Chevron, Art pursued a lifelong ambition of organizing his own company with two partners, Hydrate International, LLC. HEI conducts assessments of resource potential and geo-hazards related to gas hydrates and other unconventional resources for companies and government agencies in North and South America, Europe and Asia. In doing so he has added to our understanding of gas hydrates. Art is married to Alice (Winton) Johnson and they have one daughter, Emily.

Art has advised Congress and the White House on energy issues since 1997, and chaired advisory committees for several Secretaries of Energy. He has an ongoing role coordinating the research efforts of industry, universities, and government agencies. He served as a lead analyst for the "Global Energy Assessment," an international project supported by the World Bank, UN organizations, and national governments that evaluated the resource base of the entire planet with a view of addressing energy needs in the decades to come. Art has published over 80 papers and articles, along with several books. These cover a diverse range of topics that include geology, geophysics, economics, and astrogeology.

Art has served as the chair, Energy Minerals Division, Gas Hydrate Committee since 2002, short course instructor at the 2008 and 2010 ACE meetings, and EMD Technical Program chair, ACE 2010. He is the coauthor and coeditor for Memoir 89: *Natural Gas Hydrates-Energy Resource Potential and Associated Geologic Hazards*. He also is coauthor of Memoir 101: *Energy Resources for Human Settlement in the Solar System and Earth's Future in Space*. Art is the author of two articles for the *AAPG Explorer*.

In addition, he has been a poster and oral presenter at multiple ACE, OTC, and 3P Arctic meetings. Art has also been an oral presenter at Pacific and Eastern Section meetings, and proudly a member of AAPG Astrogeology Committee. Art is a visiting geoscientist with 2-4 college visits per year. He is also a NOGS delegate to the AAPG House of Delegates.

For the AAPG affiliate, the New Orleans Geological Society, he has served as president 2007-2008 and as a board director 2009-2012, treasurer 2014-2015 and is a board member and past chairman of the NOGS Memorial Foundation. He participates in NOGS school outreach with 10-25 K-12 classroom visits per year. Art is a trainer and participant in NOGS activities at the Louisiana Children's Museum. He is planning team member, Deepwater Technical Symposium (New Orleans) and

an organizer of the DWTS Geoscience Seminar 2015, with Paul Weimer, presenter.

For the 2013 GCAGS he was general chairman and sponsorship chairman, and was publicity chairman for the 2005 Convention

Art is the secretary/treasurer, of the Louisiana Board of Professional Geoscientist, 2014-2016. He participated in formulating the criteria for registration with the board.

For the above reasons and his commitment to the local and geosciences community, Arthur H. Johnson is worthy of the AAPG's Distinguished Service Award.

William M. Whiting
Edward B. Picou, Jr.

STEPHEN E. LAUBACH
Distinguished Service Award

Citation—Dr. Stephen E. Laubach is a recognized expert in rock fracture and structural diagenesis, advising AAPG, SPE, industry, and the nation.

Stephen E. Laubach is a senior research scientist at The University of Texas at Austin's Bureau Economic Geology where he leads the fracture and structural diagenesis programs. The focus of the structural diagenesis effort is a new research and training paradigm in sedimentary geochemistry and structural geology (see *Journal of Structural Geology*, 2010, v. 32, p. 1866-1872). Laubach's research interests include unconventional and fractured reservoirs, and microstructural, fluid inclusion and cathodoluminescence applications to structural geology and sedimentary petrology.

Laubach served on the Executive Committee as Elected Editor and was instrumental in founding the new Petroleum Structure and Geomechanics Division. He helped launch the new peer-reviewed journal *Interpretation*, a joint effort between AAPG and SEG. Laubach founded the AAPG Charles H. Taylor Fellowship in support of scientific publishing in 2012, restructured the *AAPG Bulletin*'s editorial board, founded the AAPG Books Editorial Board, and instituted *AAPG Bulletin*'s online Ahead of Print publishing and Notable Papers recognition.

He is past chair of the Jackson School's Energy Geoscience Education and Research Group at UT and served as a co-opted member of the Petroleum Group Committee of the Geological Society of London (from 2008 to 2012). He was a Distinguished Lecturer for AAPG in 2011-2012 and Distinguished Lecturer for the Society of Petroleum Engineers in 2003-2004. He was a member of the Committee to Assess the Science Proposed for a Deep Underground Science and Engineering Laboratory, National Research Council, 2010-2011 and the Committee on Advanced Drilling Technologies, National Research Council, 1992-1994. He served as co-chairman of the First North American Rock Mechanics Symposium in 1994.

Laubach supervises graduate student research in structural geology and diagenesis in the Jackson School of Geosciences. His papers on fracture growth and reservoir characterization are consistently among the hottest downloads from multiple journals.

Steve Laubach grew up in Lyme, Connecticut. He received his Ph.D. in geology from the University of Illinois-Urbana in 1986 and a B.S. in geology and German literature from Tufts University in 1978.

Richard A. Schultz

GEIR LUNDE
Distinguished Service Award

Citation—To Geir Lunde in appreciation of his leadership, visions and dedication for organizing and serving AAPG

European Regions Conferences from 1999 to 2012.

Geir Lunde began his career with a M.Sc. in petroleum prospecting from the Norwegian Institute of Technology in Trondheim in 1978. Later Geir had supplementary education within management and company development.

Geir's first permanent appointment in the oil industry was with Norsk Hydro as senior geologist and project leader from 1979 to 1985. In this position, Geir was responsible for the planning of the first wells in the Barents Sea and from the 5th concession round responsible for all concession rounds north of 62°. He was involved in the discoveries of the Snøhvit, Alke, Åsgard and Brage fields and in Norsk Hydro's international activity. He was responsible for the company's entrance into the Netherlands and had a key impact on the planning of the discovery well in block F15.

His next appointments were as co-founder of 3D-Consultants, the first three-dimensional seismic consultancy in Norway, and as assistant director for Nopec from 1985 to 1991. He was project leader for various multiclient studies in Norway and internationally, and also worked with business development studies in Angola and Russia. He contributed to the identification of the deep-water potential in Angola in 1991.

From 1991 to 2003 Geir worked for Fortum Petroleum and became exploration manager and vice president exploration and business development (previously Neste Petroleum and later acquired by Eni in 2003). He played among others a key role in the discovery of the Goliat field in the Barents Sea and in several exploration asset swaps. He was a member of the international Fortum E&P management team.

From 2003 to 2004 Geir was managing director of the Icelandic company and Norwegian unit of Geysir Petroleum hf. He also was vice president business development and chief geologist for Altinex Oil from 2004 to 2005.

Geir is currently managing director for Concedo ASA. The company started as Vienco Hydrocarbons Subsurface (VHS) in 2005 with four experienced specialists on subsurface evaluation. By the end of 2006, VHS became Concedo ASA. Geir has more than 30 years of experience from the Norwegian and international oil industry.

During his career, Geir has always had his focus on exploration. He has a broad subsurface experience with emphasis on geology and seismic interpretation, and has a long experience as project leader for regional studies and concession rounds.

It was a pleasure for me to promote Geir Lunde as a candidate for the AAPG Distinguished Service Award. I have known Geir since I started as technical program chair in 1999 for the St. Petersburg Conference 2001. Since then we have worked together to serve AAPG especially in the European Regions context (Prague 2004, Mallorca 2006, Athens 2007, Oslo 2008). Geir has been an AAPG member since 1979 and has served AAPG from 1999 to 2012. He was oral session chairman for the joint AAPG/ VNIGRI St Petersburg Conference in 2001. He was responsible for conferences in the AAPG-European Region 2006-2012, including involvement in the 2006 Mallorca, the 2010 Paris –Malmaison and the 2010 Black Sea Conferences. He was general chairman for the JV AAPG/AAPG-ER International Conference in Athens 2007 and general chairman for the AAPG-ER North Sea Conference "After 40 Years" in Oslo 2008. He also served the Milano International Conference in 2011 as member of the coordinating committee,

During the years I have known Geir to be a person with high ethics and as a talented and professional leader, both as a manager for Concedo (the company he founded) and in personal relations. Geir only confirmed this when I joined Concedo in January 2009 and I got to know him even better.

As a decision maker and with respect to professional insight and competence, Geir has proven to be highly qualified and to be an important discussion partner whenever evaluating Concedo's licensed areas and when searching for and evaluating new exploration targets.

During his professional career Geir has held many leading positions; he has been involved in networking related to oil companies, contractors, and Norwegian authorities. He worked with company promotion, especially for Fortum and has extensive experience as a board member for Nopec and Fortum.

I know Geir is well deserving of this award and I am honored to know him. Congratulations Geir!

Dirk van de Wel

TERRILYN M. OLSON
Distinguished Service Award

Citation—For sustained service and leadership in the dissemination of petroleum geoscience through AAPG publications and conferences.

Terrilyn M. Olson was born in Denver, Colorado. She also lived in Idaho, where she learned to ski, and northern Virginia during her formative years. Her mother was an English major and her father was an economist, but she was drawn to the sciences. An active imagination, the ability to visualize things in 3-D, and an appreciation of the great outdoors led her to study geology.

Terri earned a B.A. degree in geology from Colorado College and an M.A. degree from Dartmouth College. For her master's thesis, she went to the Himalayas in Pakistan to study the structure, sedimentology, and stratigraphy of a package of very young, highly deformed rocks. She later attended the world-famous Amoco Petrophysics School in Tulsa, where she met her husband of 26 years, Christof Stork. Terri began her career with Amoco in Denver, working in exploration, development, and petrophysics for 16 years before a 2-year assignment in Stavanger, where she enjoyed kransekake, folk dancing, and skiing when not working on reservoir petrophysics in Valhall field.

Terri's love of the mountains and Colorado lifestyle kept her in Denver following the Amoco-BP merger, when she joined Tom Brown Inc. as petrophysicist, Encana Oil and Gas Corporation as petrophysical advisor, and EOG Resources as petrophysical advisor. While at Encana she also recruited, trained, and mentored a cadre of young professional geoscientists. Terri was recruited by FEI in 2014 to be technical lead for unconventional reservoirs. As an early adopter of digital rock technology while at EOG, Terri has been a strong supporter of technology that bridges the gap between geological context and property analysis. Since joining FEI, Terri has been working with her team to educate others in industry about the many applications for digital rock technology and expertise, especially in operational decision-making.

Terri's career as AAPG volunteer has followed a similar upward trajectory. She was lead author of a paper published in the *AAPG Bulletin* in 1997 before transitioning to editorial roles. Terri is an excellent reviewer—diligent, technically astute, and not afraid to provide direct but constructive criticism—which has resulted in appointment and reappointment as associate editor of the *AAPG Bulletin* from 1999 to 2002 and 2003 to 2016, and elevation to senior associate editor for unconventionals when that role was introduced. She was appointed to the Publications Committee in 2001, serving eventually as vice chair and chair. Terri was appointed AAPG association book advisor at the inception of the Books Editorial Committee. Over many years, Terri has played a critical role in keeping AAPG at the forefront of petroleum geoscience publishing. She has bolstered AAPG publications, particularly special publications, by actively encouraging authors to publish their work with AAPG. As chair of the Publications Committee, Terri recruited excellent committee members and focused on encouraging them to solicit proposals on hot topics and to seek out authors and book editors who could contribute

volumes of high reader interest. As a founding member of the AAPG Books Editorial Committee and one of the first appointees to the new role of senior associate editor of the *AAPG Bulletin*, Terri continues to break new ground in what and how AAPG publishes. She is also the editor of a 2016 AAPG memoir, on imaging unconventional reservoir pore systems.

Complementing her work on AAPG publications, Terri has contributed to the other major service AAPG provides its members—conferences. She has participated in various program committees, and was one of the founding participants in the 2013 Unconventional Resources Technology Conference (URTeC) Technical Program Committee. Terri instigated the pore-scale imaging and digital rocks topic in the calls for papers for URTeC and has been building and chairing sessions on that topic for several years. Her first talk at an AAPG Annual Conference (ACE) on reservoir characterization of Hugoton Field garnered recognition from SEG as one of the "Best of AAPG" that year; her most recent ACE presentation reflected her shift in focus to technology applications for unconventional reservoirs, on the topic of high-resolution imaging of wettability and organic matter textures.

When she is not working or volunteering, Terri can be spotted on the ski slopes, in the back country, or dancing at the Avalon Ballroom, sometimes in the company of her husband and son.

AAPG publications and conferences are among the most important benefits for AAPG members, and Terri Olson has been a mainstay of both for more than 15 years. Therefore, it is appropriate to recognize Terri's distinguished service and its importance to the success of AAPG as a whole.

Gretchen M. Gillis

DEBRA PURIFOY OSBORNE
Distinguished Service Award

Citation—To Debra Purifoy Osborne, in recognition of her dedication, leadership, and long-term service to SWS-AAPG, DPA, AAPG and the profession of geology.

Debra Purifoy Osborne has distinguished herself in beneficial long-term service to AAPG, where she currently serves as Division of Professional Affairs secretary. She has also been a leader in her local professional community (many times many ways) and in the Southwest Section of AAPG.

Debbie was born in Texarkana, Arkansas, and spent her early years in Albuquerque. Debbie's father, a civil engineer, joined the United States Agency for International Development (USAID), and her family moved to Taipei, Taiwan, when she was 10 years old. She graduated from Taipei American School at 16 and entered Baylor University that fall as a biology major.

Debbie was inspired to become a geologist by taking Dr. Dixon's historical geology as an additional science class. Though she had always known that she wanted to be a scientist, this was the first time she had ever been exposed to geology. She changed her major at the end of the semester and never looked back, commenting "It was the smartest thing I've ever done." Dr. Beaver, chairman of the Geology Department, steered Debbie and many others toward the petroleum business. Debbie completed her B.S. in geology at Baylor.

Debbie has been a pathfinder and role model for other women in geoscience. She has been a consistent oil finder and a real contributing volunteer in her profession (often with more than one society at once).

Debbie began her petroleum career in 1980 doing seismic interpretation, as an exploration geophysicist, with Conoco in Midland. While at Conoco, she met her husband, Jim, a petroleum engineer. She is the mother of two fine sons. Debbie

jokes that she changes companies just so she can stay in West Texas!

A consistent theme in Debbie's life and her career is that she takes what she is given and makes it better. She helped develop many oil fields into highly profitable company assets. She has spent the last 30+ years working in the heart of the oil patch, applying new geologic methods and new oil field technology in the Permian Basin.

In her work for active companies, Debbie has mastered technical challenges in most major plays in the Permian Basin and provided good business advice on diverse projects. In her present position at COG Operating she has responsibility for unconventional exploitation of COG properties in the Midland Basin and Eastern Shelf.

Debbie has also taken what she was given and made it better with her service to our science (symposia, core workshops, bulletin editor and contributor) and her professional communities (WTGS, PBS-SEPM, SWS-AAPG, DPA-AAPG, HOD-AAPG, and Advisory Council).

Beginning in 1992 Debbie began her association with the WTGS, serving in some official capacity every year for the next 30 years—program committees, field trip committees, convening Fall Symposia, nominating committees, writing a regular *Bulletin* column, contributor to the Annual Development Paper, and making technical presentations. In addition to these concrete contributions, Debbie has been a leader in the WTGS as treasurer, 2nd vice president, president-elect, president and finally was awarded both the Dedicated Service and the Honorary Life Membership Awards.

With her typical burst of energy and good-natured attention, Debbie also contributed to the Permian Basin Section SEPM (Society for Sedimentary Geology), beginning in 1993. She served as secretary, 1st vice president, president-elect, and president. From 1999 to 2010 Debbie also served on the Board of Directors of the West Texas Geology Foundation.

During her highly successful and busy industry career, along with her selfless service to her local geological organizations, Debbie has repeatedly found the time to volunteer for AAPG. Debbie was general co-chair of the Southwest Section AAPG Convention in 1996. She has served the SWS on the Honor and Awards Committee, Loan Committee, Bylaws Committee and as 2014 SWS Convention Treasurer. Debbie has served SWS-AAPG as treasurer, president-elect, and president. Debbie served a three year term on the AAPG Advisory Council representing the Southwest Section, 2011-2014.

Debbie has spent over 15 years as a delegate and alternate in the House of Delegates. She served on the Credentials Committee and HOD Newsletter Committee, and was elected leader of her delegation (WTGS).

Debbie lists several geological colleagues and associates that have influenced her career and volunteer activities. She listed scientific mentors, Lorin Rulla and Dean Hamilton, both Midland geologists that freely gave of their time and knowledge. Debbie has particularly respected Emily Stoudt and Denise Cox as fellow women geoscientists in the Midland community.

Geological friends and colleagues in local, regional and AAPG volunteer activities included Mike Party for his tireless volunteering (Debbie remarked that, "I think he never slept"), and Charles Sternbach for his enthusiasm and vision.

Debbie has long been an AAPG role model and leadership example and mentor. She has taken part in five AAPG leadership conferences: as president of WTGS, as president of Southwest Section AAPG, and as a member of AAPG Advisory Council. AAPG involvement has long provided Debbie with many friends, leadership guidance and personal mentoring that have led to her long term and continuous commitments to AAPG.

Debbie also extended her leadership activities to the Division of Professional Affairs. In recognition of her thoughtful leadership and the respect of her peers, Debbie was asked to serve as DPA Councilor for SWS. She has also served DPA on the Membership Committee, the

Honors & Awards Committee; as well as, holding two offices—DPA treasurer and currently, DPA secretary.

Debbie received recognition from AAPG as an energetic and exemplary leader with the AAPG HOD Certificate of Service in 2009, and the AAPG Certificate of Merit Award in 2009.

Debbie Osborne's dedication exemplifies the long-term, beneficial service to SWS, the DPA, and AAPG that makes Debbie so worthy of this Distinguished Service Award.

Stephen L. Shaw

BRENDA L KIRKLAND
Grover E. Murray Memorial Distinguished Educator Award

C*itation*—For sustained dedication, in the face of adversity, to students, multidisciplinary science, cultural diversity, and family through outstanding teaching, counsel, and guidance.

Brenda was genetically engineered for AAPG membership. Both her parents are geologists. Her father worked for Pure Oil when Brenda was born, and went on to work for 27 years for Mobil Research. Her mother worked for Entrada Corporation, a company run by Brenda's grandfather, and later for Mobil Research. Brenda grew up with her mother's childhood stories of living in an oil boomtown in southeastern New Mexico and of visiting cable-tool rigs with Brenda's grandfather.

Brenda grew up in a house filled with interesting rocks and fossils. Summer vacations were planned around fieldwork, and dinnertime conversations covered topics ranging from insect evolution to source rocks. Most dinner guests and family friends were AAPG members. Brenda had a talent for learning languages and initially rebelled by studying German and Spanish at The University of Texas. She was encouraged by her mother to sign up for the physical geology course taught by a guy named Folk. She thoroughly enjoyed the course and opted for geology. At that time, the undergraduate curriculum in geology at The University of Texas emphasized petrography, and courses from Professors Clabaugh, Jonas, and Barker gave her a strong foundation in microscopy that have served her well throughout her career.

After graduating from UT with degrees in German (1980) and geology (1982), she spent the academic year 1982-1983 in Munich, Germany, aided by the Federation of German-American Clubs and a Fulbright Travel Grant. That year broadened her self-reliance and cultural horizons. Munich is a beautiful city. Each one of her many visitors wanted to see Dachau, and Brenda will tell you she made too many trips there. She realized years later that those haunting visits left her with a passion for fundamental human rights and a lifetime commitment to enhancing diversity in education, science, and the workplace. While in Munich, she took her first carbonate class, a seminar on microfacies given by Torsten Steiger, a student of Erik Flügel. From then on, she was hooked on polished carbonates with lovely fossils. Back in the United States, she took classes in carbonates at Texas A&M University from Wayne Ahr, Robin Lighty, and Richard Rezek, who introduced her to fossil algae. Her thesis, under the direction of Thomas Tieh, was on the Sligo Formation of South Texas. Brenda went next to Louisiana State University to study under Clyde Moore, who allowed her freedom to ponder the role of fossil algae in depositional systems. She spent many blissful hours looking at thin sections, taking photos, and perusing the stacks of Smackover cores lining hallways. Her dissertation focused on the Capitan Reef of the Guadalupe Mountains.

She started teaching at UT Austin in 1992 and worried that she should be paying them for the privilege of having a job she enjoyed so much. Around that time, Brenda had the

opportunity of working on the Capitan Reef with Susan Longacre and Emily Stoudt. They studied the outcrops in detail and literally crawled on their hands and knees along the Reef Trail looking for fusulinids to mark a time line. The collaboration taught Brenda how to do good science efficiently, effectively, and with passion.

At the University of Texas, Brenda had the pleasure of working with many talented students on a wide spectrum of research topics from modeling algal bioherms to deciphering sequence stratigraphy. While there, she won two awards for excellence in teaching: one, by student vote, largely for teaching graduate courses in carbonate depositional systems and carbonate petrography, and the other, by faculty nomination, largely for organizing and running creative field courses with Tony Dickson and Art Saller for students from The University of Texas and Cambridge University. The field courses taught her that students often learn more by walking across rocks than from books or lectures. During this part of her career, Brenda also had the good fortune of working with Rachel Wood.

Brenda's fascination with microbial carbonate along with her background in botany drew her into the nannobacteria debate at UT. She tremendously enjoyed working with Drs. Folk and Lynch, and marveled at their ability to push the old SEM at UT beyond what it was engineered to image. In 2000, she moved to Mississippi State University and continued to work on nanometer-scale features in rocks, but now at the world-class microscopy facilities of the MSU Institute for Imaging and Analytical Technologies. These facilities, shared by engineers and biologists, gave Brenda the ability to look at the interface between microbes and precipitates at a nanometer scale. Brenda and her students continue to pursue questions about the relationship between organic matter and carbonate precipitation. She created innovative classes designed to share her research with students. Brenda finds working with the students at MSU particularly rewarding. Many of them face an array of formidable challenges, yet they are just as hard working and inherently intelligent as any of the high-scoring students she worked with at UT. They all share the same remarkable potential.

When Gretchen Gillis and Tim Diggs nominated Brenda for this award, letters of support poured in from students, many of them noting her compassion in their time of need. Brenda's own life has been filled with challenges. She went through tenure denial and divorce. She remarried and rebuilt her life only to learn that the second of her three children has autism. Her greatest sorrow, however, was the devastating loss in 2009 of her husband and best friend, F. Leo Lynch, III. She coped with the loss by putting her energy into teaching, supervising fantastic students, and raising wonderful children. She has enthusiastically taught a broad spectrum of 23 different courses ranging from structural geology (including an edible tectonics demonstration done with layers of cake) to technical writing (where students write about individual research projects). She has also supervised thesis topics on wind energy, geothermal energy, sequence stratigraphy, diagenesis, carbon sequestration, sponges, algal mats, stromatolites, and travertine. She remains creative, curious, and willing to learn with and from her students.

Peggy L. Kirkland and Douglas W. Kirkland

Response

I am honored to have been selected for the Grover E. Murray Memorial Distinguished Educator Award. At the same time I am humbled, astounded, and grateful.

I was honored simply to be nominated for this award by Gretchen Gillis and Tim Diggs. I was humbled by the outpouring of letters from colleagues, mentors, and especially students. Their comments were kind and heartwarming. I am truly fortunate to have worked with so many excellent students over the course of my career.

I was humbled by the list of previous recipients. I took classes from R.L. "Luigi" Folk, Wayne Ahr, and Clyde Moore, who was my doctoral advisor. The list also includes some of my favorite

authors. I learned, and continue to learn, from textbooks by Jim Wilson, George Asquith, and Paul Wright. I've met many of the men on this list and I am humbled to join them. I am also grateful to Grover Murray for establishing this award to honor teaching.

I was astounded to realize that I was the first woman on the list. As a young faculty member I was blissfully unaware of the many hidden obstacles that hinder women in academia. I think I stumbled into all of them along the way, but I learned from every disappointment. I am grateful for this award, because it provides healing for a career filled with frustrating challenges. It also provides me with more motivation to assure that all individuals, women or members of other underrepresented minority groups, are recognized and treated fairly.

I am grateful to be recognized for doing what I love to do. I trained for the petroleum industry, but opted to teach. Academia allowed me the flexibility to care for my three children, one of whom has autism, a time-consuming and expensive condition. I am grateful to the Department of Geosciences at Mississippi State University for being consistently supportive of my tumultuous schedule. As a single parent of a special-needs child I could not afford to stay in an academic position without the generous financial support of my parents. I marvel at the technology and innovation in industry today. I often wonder if staying in academia was the right choice. Being selected for this award tells me that I did indeed choose the correct path.

I am grateful to have spent so many years teaching and working with wonderful students. Teaching has always been my passion, and after the death of my husband, it became my salvation. Watching students learn brings me a joy that heals. Over the course of my career, I have taught an unusually broad spectrum of courses in an array of venues: on campus, online, and in the field. At The University of Texas at Austin, I taught a mixture of introductory courses and graduate courses. At Mississippi State University I have taught whatever needs to be taught. Some courses, such as Mineralogy, were extremely challenging for me, but I am a better geologist for it. I have also been fortunate to participate in many different outreach and teacher-training efforts. Because of these experiences, I can now say that I have had the pleasure of teaching students at of every educational level from pre-K to professional. I have also had the pleasure of working with some of the best graduate students in the world. The students that I worked with at The University of Texas were all outstanding, and the students that I have worked with at Mississippi State University have been just as bright and diligent.

After 24 years of teaching, I remain stubbornly, unapologetically enthusiastic. My unconventional teaching philosophy focuses on what students will remember long after they graduate. I argue that in the geosciences, essential technical skills are more important than memorization of evolving content knowledge. I teach students using a combination of traditional lectures and hands-on participation. I want them to remember concepts, retain skills, and learn how to think problems through. One example of this is my favorite structural geology lab. I haul blocks of landscape stone out onto the grass in front of our building. I carefully arrange and prop the stones up in the pattern of an outcropping plunging anticline. The novice students are initially completely baffled by the crazy lady with the tilted rocks. They take the strike and dip of each stone and place it on a map. As the afternoon lab goes on, they slowly start understanding and eventually seeing the three-dimensional structure in their minds. I love to watch their faces go from befuddled and annoyed to enlightened and confident. The students leave the lab with an inherent understanding of how to make and interpret geologic maps, experience with fundamental field techniques, and stronger three-dimensional visualization skills. I finish the day with tremendous satisfaction.

It is hard for me to put into words how much this award means to me. It is certainly a high point of my academic career, but also of my life. My career and life are, and have always been, fully intertwined. My father was my first geology teacher. My first memories include riding my tricycle down the halls of the geology building at the University of New Mexico where my parents

were both graduate students. I attended my first AAPG meeting in Dallas at the age of 13. I vividly remember attending a talk that included phenomenal images of Canadian mountainsides taken from a helicopter. I was fascinated then and still am now. My father continues to seize every opportunity to learn and to teach. I would not be where I am today without my parents. They are very important to me. My late husband, F. Leo Lynch, was a brilliant geologist. He had an encyclopedic mind, and a passion for clay minerals. He was a great teacher, an excellent scientist, and an incredibly creative individual. I miss him, and his expertise, every day.

Brenda L. Kirkland

XIAOMIN ZHU
Grover E. Murray Memorial Distinguished Educator Award

Citation—To Professor Xiaomin Zhu's for his great contributions to the fields of teaching and research in sedimentology, sequence stratigraphy and petroleum geology in China.

Xiaomin Zhu was born into a workers' family in 1960 in the ancient town of Yangzhou, on the banks of the mighty Yangtze River, in China's eastern Jiangsu province. During his youth, he hoped to become a mechanical engineer as per his parent's wishes. In 1978, after finishing high school, he tasted success in the national college entrance examination and enrolled in the East China Petroleum Institute in Shandong province to study petroleum geology, a subject that did not excite him very much initially.

After receiving his bachelor's degree in 1982, he nevertheless pursued a master's in petroleum geology at the China University of Petroleum (CUP) in Beijing, under the supervision of Quanlin Xin. That's when his interest in the subject, especially sedimentology, deepened. In 1983, Xiaomin Zhu interned at Sinopec's Shengli oilfield, focusing on cores, under the guidance of his supervisor. Soon, his deepening interest turned into sheer fun. Xiaomin Zhu found the task of identifying sedimentary facies by the integrated study of color, lithology, sedimentary structures, depositional sequences, and other indicators of facies, amazing and challenging at the same time. Sedimentology was to become his lifelong love.

In 1985, after receiving his master's degree, Xiaomin Zhu became a lecturer at his alma mater in Beijing, teaching a course in sedimentary facies for graduate students. Then, he started his Ph.D. study in 1987 under the supervision of Zengzhao Feng and Quanlin Xin at the CUP. Under the instruction of Xin, who emphasized how tectonic movements control sedimentation, Xiaomin Zhu carried out integrated research into "tectonic-lithofacies belt" to determine various hierarchies of structural units and movements, and how their geomorphology differentiations control the types of depositional systems, establish tectonic-lithofacies models of various hierarchies of structural units in the lacustrine rifting basins, and effectively guide hydrocarbon exploration in the terrestrial sedimentary basin. He was awarded his Ph.D. in 1990.

Xiaomin Zhu has been teaching and researching geology at the CUP for almost 30 years. For his exceptional services, he was promoted to associate professor in1992 and then professor in 1994. Xiaomin Zhu served as the dean of the College of Geosciences from 1998 to 2011. From November 1999 to April 2000, Xiaomin Zhu also served as a visiting scholar at The University of Texas at Austin. There, he was guided by William Fisher.

Xiaomin Zhu teaches sedimentology for undergraduate students. The course clarifies provenances, compositions, and structures of sedimentary rocks. The course also introduces concepts and classifications of sedimentary facies, features, and models of

clastic and carbonate sedimentary facies. The sedimentology course is among the CUP's select few courses that have been identified as innovative. Xiaomin Zhu developed a seminar-style teaching model by using fluent, intelligible, well-organized and illustrated multimedia course materials that combine adequate analogues from modern sedimentation and subsurface data in oilfields. The students majoring in geology love this course. Small wonder, Xiaomin Zhu was recognized as one of the top 10 teachers at the CUP. In 2007, his sedimentology course was recognized as a "China National Superior Course," which had a demonstrable positive impact on China's sedimentological sector.

Besides, Xiaomin Zhu teaches sequence stratigraphy for graduate students. Sequence stratigraphy is a subject that started to become increasingly popular during the late 1980s. It has become an important required course for graduate students majoring in geology. The course mainly introduces major theoretical perspectives and research methods of sequence stratigraphy. With a series of experimental analyses (outcrop, well-log and seismic data) under the guidance of Xiaomin Zhu, students are able to understand the fundamental concepts and theories of sequence stratigraphy, and learn the essential skills for research, which is crucial for paleogeographic reconstructions and subtle trap prediction. The sequence stratigraphy taught by Xiaomin Zhu has been the most popular and influential degree course for graduate students at the CUP.

Furthermore, Xiaomin Zhu organizes annual field trips for geological students. He takes real geological phenomenon as examples to illustrate concepts and models of sedimentology and sequence stratigraphy. This helps students to better understand the concepts, and makes them more enthusiastic about the subjects.

Xiaomin Zhu's compilation, entitled *Sedimentary Petrology* (4th edition), is a sedimentology textbook that sold nearly 50,000 copies. It was selected as a "National Planning Textbook" and as a "National Quality Textbook." The book has been used by Peking University, Nanjing University, and 20 other colleges and universities. Another textbook that he authored, "Sequence Stratigraphy", sold nearly 10,000 copies, and has been used by more than 10 colleges and universities in China. These two textbooks are considered the most important and influential geology textbooks in China.

Through teaching and research, Professor Xiaomin Zhu has remained devoted and dedicated to sedimentology, sequence stratigraphy, and petroleum geology for decades. Since 1992, he has been a supervisor of students pursuing master's and doctoral degrees in sedimentary geology. Most of these students are committed to working and researching at leading petroleum companies and universities in the United States and China. They hold significant roles as managers or professors.

During his long career in sedimentology, sequence stratigraphy, and petroleum geology, Xiaomin Zhu has accomplished research work in more than 20 sedimentary basins in Asia and Africa. He hosted nearly 100 research projects, published 5 monographs, and coauthored 360 papers. All of these achievements have had a significant impact on the science of geology.

Over the decades, Xiaomin Zhu has actively participated in academic activities in China and abroad. He presented many oral and poster presentations at international meetings and at China's academic conferences in sedimentology and sequence stratigraphy. He also serves as the associate editor for several research magazines, including *Marine and Petroleum Geology*, *Geological Review*, *Geological Journal of China Universities*, and *Journal of Paleogeography*. He makes significant contributions and receives regular recognitions for accelerating the development of sedimentological disciplines and academic communications.

To reiterate, Xiaomin Zhu is an excellent teacher with almost 30 years of full-time teaching experience at the College of Geosciences of the CUP. His important contributions to higher education have helped him to win numerous awards,

including the Li Siguang Geological Science Prize in 2009, the highest award in Chinese geology academia, and the National Excellent University Teacher Award in 2011. Xiaomin Zhu is a sedimentology professor who loves his students and is known for taking responsibility, and displaying high efficiency and great interest in teaching and researching sedimentology.

I am not only his biographer but also a post-doctoral researcher under his supervision. I am deeply privileged to be a member of Xiaomin Zhu's research team. I believe honoring Xiaomin Zhu with the Grover E. Murray Memorial Distinguished Educator Award will bring international recognition for all Chinese geology experts and scholars, besides broadening their global reach and impact. The award will also help promote the development of geology in general and sedimentology in particular in China.

Shunli Li

Response

I am deeply honored to be selected for the AAPG 2016 Grover E. Murray Memorial Distinguished Educator Award.

I am also grateful to the kind people who nominated me, and to Shunli Li for his generous profile of me.

I'd like to first pay my respects to Grover Elmer Murray, the great American geologist after whom the award is named. To be a recipient of such an award not only fills me with immense pride and joy but places a big responsibility on me.

Murray was not just an accomplished geologist. He was also an educator, researcher, petroleum consultant, administrator, mentor to students and junior colleagues, and founder of professional associations.

We need more people such as Murray who was instrumental in making geology and related sciences well known across the world, and inspired generations of young people such as myself to take to geology and stay with it for a lifetime.

The more I read about Murray, the more I was struck by some parallels in our lives. And I say this not to compare myself with the great man but to indicate how similar life's patterns and vicissitudes could be irrespective of cultures, continents, and time periods.

In 1978, I enrolled into the East China Petroleum Institute to study petroleum geology, which was considered a tough major, even though I was not passionate about it. Fortunately, when I was systematically studying geological theories at college, I had a few great teachers.

The important figure was Chenglin Zhao, who was my enlightened tutor for sedimentology. He illustrated the sedimentary principles clearly by colloquial humor and adequate vivid pictures.

In 1982, after graduation, I continued to work for my master's program under the supervision of Quanlin Xin. Under his guidance, we visited the Shengli oilfield of Sinopec in Shandong province and worked on cores. This work excited me no end and inspired me to conduct research into sedimentary facies. Subsequently, I became interested in the research of Palaeogene deltaic and turbidite systems in lacustrine rifting basins.

In 1985, after receiving my master's degree, I became a lecturer, and taught the course of Sedimentary Facies for graduate students at East China Petroleum Institute. This was the first stage of my teaching career that was to prove full of challenges.

Besides the science of geology, the art of teaching consumed my consciousness. I wanted to master both. In 1987, I was lucky to become a Ph.D. student under the supervision of Zengzhao Feng and Quanlin Xin at the China University of Petroleum in Beijing (CUP).

My dissertation focused on basin tectonic movements and their control of sedimentation. I developed the integrated study of "tectonic-lithofacies belt," and determined various hierarchies of structural units and movements and their geomorphology differentiations' control on depositional system types, establishing tectonic-lithofacies models in the lacustrine rifting basins.

In 1990, I successfully completed my Ph.D. and went back to teaching at my alma mater, the CUP. Nothing less

than fortune awaited me there, in the form of Chenglin Zhao, director of the Geology Department and a well-known sedimentologist in China. He offered me a five-year development program, which provided me solid teaching experience. I nursed a dream: to be an excellent sedimentology teacher like Chenglin Zhao.

From 1998 to 2011, I was honored to be the dean of the College of Geosciences at the CUP. Although I had a busy working schedule due to duties like administration, management and scientific research, I considered teaching an honor to be proud of, to be performed with great responsibility as it could have an influence on the future of students. No matter how busy I was, I would seriously prepare the lessons, make preclass analysis, draw up teaching design, and lecture on sedimentology and sequence stratigraphy using colloquial terms with illustrations and pictures. It was great fun.

I also realized the importance of field geological practice for students. I guided students with observations on sedimentary aspects and through annual outcrop geological seminars, combining theoretical knowledge in the class with on-field geological analysis, and improving the students' ability to understand geological theories and solve geological problems.

I also set up a website for sedimentary petrology and updated it regularly with teaching documents and other materials, which, I am happy to say, made Sedimentary Petrology the most popular course for students majoring in geology.

From November 1999 to April 2000, I received the honor and privilege to work with William Fisher as a senior visiting scholar at The University of Texas in Austin. I learned the Sequence Stratigraphy course that was lectured by Fisher, and the Basin Analysis course lectured by Professor Galloway. These two courses broadened my ken, widened my professional network and, more importantly, exposed me to the seminar-style teaching model.

My almost 30 years of teaching and researching are full of delightful and unforgettable stories. I will not forget the colleagues and students who encouraged me, the scientific issues that inspired me, and the academic journals and seminars that published my papers and research findings. They were all great sources of encouragement and inspiration, giving me the energy and enthusiasm to carry on.

I would like to express my deep sense of gratitude to AAPG for honoring me with the Murray Award.

I thank my wife, Nan Ge, a music teacher at CUP, and my daughter, Wenqian Zhu, who is a business journalist with the *China Daily*, an English-language international newspaper, enough for all their care, concern, and love. Without their unstinted support and understanding, I wouldn't have been able to achieve whatever I have.

Many thanks also go to my supervisor William Fisher of The University of Texas in Austin and Laibin Zhang, president of the China University of Petroleum, for their warm recommendations.

It is particularly rewarding for me to share this high honor with my colleagues and students.

Xiaomin Zhu

GARY BARCHFELD
Harrison Schmitt Award

Citation—For flawlessly documenting AAPG and its members, volunteers, leaders, and honorees as they advance the science of geology, promote technology, and inspire high professional conduct.

Gary Barchfeld is a world-renowned photographer celebrating his 42nd anniversary as a commercial photographer, entrepreneur, and artist.

Gary began his career as a staff photographer with Firestone Tire and Rubber in Akron, Ohio,

where he experienced his most thrilling moment as a young photographer. Gary was trackside at the start of the 1973 Indianapolis 500 Race when Salt Walther's car hit the wall, spewing fuel all over the track and fans. He noted, "That accident was one of the worst in the history of the Indy 500 Race. I have a picture of a car upside down with another race car going under it."

In 1973, he moved with wife, Catherine, and young daughter, Lisa Marie, to Houston to open a photography production studio, Barchfeld-Zalar Productions, with longtime friend, Greg Zalar. Barchfeld-Zalar's initial success came from working with George Mitchell's advertising agency to promote Mitchell's properties, including a groundbreaking effort known as The Woodlands, now home to the ExxonMobil Houston-area campus. Over the past 42 years, Gary's work has appeared in advertisements, magazines, brochures, annual reports, and framed art hanging in the offices of his many clients.

In 1977, Gary and Greg founded Houston Photographic Laboratories, which became one of the premier commercial photo labs in Texas, later complementing their organization to co-partner with advertising agency Griffin & Associates. Gary went on, in 1984, to start Adtech Photographic Laboratories in San Antonio with his friend Lee Young. In 1995, Gary purchased the Color Place. Together with Young, they revived the aging lab, changed the name to Adtech Photo Imaging, and brought the sister companies into the digital age. Gary served as president of Bristol Marketing Company, a Houston firm specializing in marketing, market research, registrations, and online services. Gary's entrepreneurship has generated many creative jobs for the city and state.

Gary specializes in commercial photography for the oil and gas industry. In the early days, he spent most of his time on location in some of the most remote and most picturesque areas of the United States. In the early 1990s, the association and trade show portion of his business became his major focus. Together with his longtime partner, the late Jon King Keisling, another great friend of AAPG members, Gary has been traveling the world capturing images to document events from tradeshows to executive functions.

Gary has been involved in the last 40 Offshore Technology Conferences and was the official OTC photographer for 37 consecutive OTCs. The OTC, cosponsored by AAPG and held in Houston every May, is the largest petroleum exhibition in the world. He has served as the official photographer for the Society of Petroleum Engineers, the American Association of Petroleum Engineers, and the Society of Exploration Geophysicists. Gary has done extensive executive photography for the largest public oil company in the world, ExxonMobil, as well as the largest private oil company in the world, Saudi Aramco. He also photographs many of the prominent corporate and political figures in Houston, including the last eight mayors of Houston, the most recent of whom honored his community service by proclaiming July 4, 2013, as "Gary Barchfeld Day!"

Beyond his commercial work, Gary has achieved personal artistic success. His collection of images entitled "Russia in Transition" has been featured in Houston's prestigious FotoFest. Another exhibition, "Albanians in Athens—a Positive Picture," opened in June 2008 in Athens, Greece, later touring the United States for a year, concluding with the photo exhibit as a major highlighted display at the Cooperative Baptist Fellowship Convention in Houston's George R. Brown Convention Center.

Gary has compiled a remarkable set of personal records, many of interest to geoscientists who have worked in the field:

- Coldest photoshoot, two locations, both -39°F with gusting winds, shaker equipment in a blizzard north of Edmonton, Alberta, Canada, for a drilling fluids company, and drilling rig at night, in the middle of nowhere in Wyoming, for an equipment company.
- Hottest photoshoot, Salton Sea Desert in California and the Mexican desert, 109°F, for a thermal drilling brochure.
- Lowest-elevation photoshoot on land, 282 ft below sea level in Death Valley, during a road paving assignment for Dow.

- Lowest-elevation photoshoot, 800 ft below sea level while photographing deep sea creatures in a two-person submarine.
- Highest-elevation photoshoot on Earth, sunrise over the Himalayas, Nepal, for a personal project.
- Highest-elevation photoshoot in open aircraft, 8,000 ft, for a magazine article about skydivers.
- Most shocking photographic experience, jumping into 52°F water in the Pacific Ocean, in full wetsuit, for an underwater scuba story for a magazine.
- Best endorsement, former US president George H. W. Bush telling his entourage that Gary is one of the best photographers that has ever photographed him.

While the most interesting photographic subjects arguably are AAPG members and their work, Gary recalls author James Michener as the most interesting person he has photographed. Gary's photograph of Michener, taken for a magazine as Michener was concluding the book *Texas*, was featured on the back cover of the book.

Gary married Martha Charlton Patton in 1996 at Memorial Drive Baptist Church (MDBC) in Piney Point Village, in Houston, where they were active members. Martha has been a mainstay of Gary's demanding career and a friend of the AAPG members she meets at ACE, ICE, and other industry events. Gary and Martha built their retirement home and relocated to Wimberley, Texas.

Gary has spent his career pursuing and achieving excellence in Photography.

Gary began photographing the accomplishments of AAPG and its members at the 1994 ACE in Denver. Throughout many years and events, he has been unfailingly professional, polite, and pleasant to work with. From honors and awards ceremonies to the Imperial Barrel Award competition to technical sessions at conferences, he has been supportive of and sensitive to his subjects. Gary understands and appreciates the significance of AAPG and its members and events. The artistic sensibility, diplomacy, and kindness that he has provided to AAPG are worthy of recognition as he concludes his career. Gary Barchfeld has made AAPG look good!

Gretchen Gillis and David Cook

WILLIAM AUBREY COBBAN (posthumously)

Harrison Schmitt Award

Citation—Bill Cobban was an exceptional field collector, geologist, paleontologist, biostratigrapher, mapmaker, mentor who made the biostratigraphy of the Western Interior marine Cretaceous clear and understandable.

W.A. "Bill" Cobban was born in Great Falls Montana, attended the University of Montana and in 1940 went to work for Carter Oil Company (Exxon) as a geologist, stratigrapher, and mapmaker. In 1946, Bill attended Johns Hopkins University receiving his Ph.D. in 1949. He began his career with the US Geological Survey (USGS) in 1948 with fieldwork on the Cretaceous deposits of southeastern Montana and northwestern South Dakota.

Over the next 70+ years he fundamentally changed our understanding of the Upper Cretaceous Western Interior geology. Bill visited and collected more Cretaceous outcrops than any other geologist past, present, or future. At every locality he took measurements, collected fossils, and made impeccable notes. His publications show us his uncanny abilities of observation, interpretation, and deduction. From his field notes, he helped create a USGS database of over 14,000 Mesozoic molluscan localities from the Western Interior and nearly 1000 molluscan localities from the southern and eastern United States.

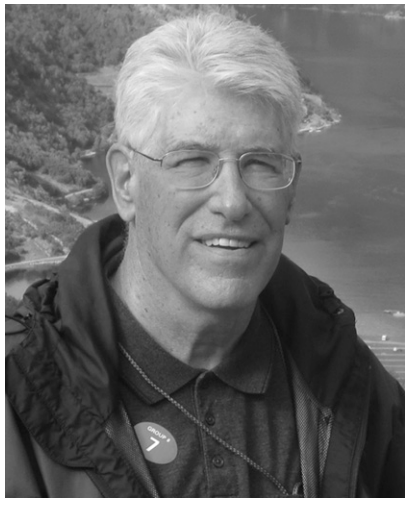
Bill was a disciplined researcher who authored and coauthored more than 335 papers on the invertebrates, biostratigraphy and geology of the North American Late Cretaceous. Along with John

Obradovich, they assigned the most accurate and accepted Ar/Ar dating to many of the Upper Cretaceous bentonite layers. He was responsible for naming, defining, and dating most of the 71 Upper Cretaceous ammonite zones of the Western Interior. These zones and corresponding ages are recognized by geologists worldwide as the standard for Upper Cretaceous zonation of the United States Western Interior.

During his career he named and described at least 35 genera, 2 subgenera, 215 species, and 11 subspecies of ammonites along with 18 species of inoceramids. Bill had 4 ammonite genera, 1 bivalve genus, 1 plant genus and 18 species of invertebrates named after him. He had several different awards bestowed on him during his illustrious career including: the Meritorious Service Award, Distinguished Service Award and Dallas Peck Award (Department of Interior), the Distinguished Geologist Pioneer Award (Paleontological Society), Raymond C. Moore Paleontology Medal (SEPM) and now posthumously the Harrison Schmidt Award (AAPG).

Each and everyone who had the opportunity to visit this great and humble man will forever remember him through his many publications and the collections he helped acquire and curate at the Denver Federal Center Building 25. His fieldwork on the ammonites and geology of the Upper Cretaceous Western Interior will never be equaled; his contributions and insight will be utilized for generations. He left this world a much better place and all who knew him were enriched by his friendship, patience, knowledge and wisdom.

Neal L. Larson



LAWRENCE ANNA
Public Service Award

Citation—To Lawrence (Larry) O. Anna in recognition of his work to promote an understanding of public issues related to earth science, and to promote an understanding of geologic processes to legislators, policy makers and the general public.

Larry was born and raised in Edgewater, Colorado, a small western suburb of Denver. He attended the University of Colorado at Boulder and initially majored in finance, but after taking an elective geology course, switched his major to geology. He soon realized geologists not only have technical and scientific aptitude, but have an amazing ability to visualize rock systems in 3-D that are thousands of feet underground, shaped by an understanding of present-day land and water environments. It is a unique blend of creativity, technology, and science—a combination he couldn't resist.

He received a B.A. in geology and went to work for Conoco in Casper, Wyoming in the uranium exploration office. A year and a half later he applied and was accepted to a research and teaching appointment in the South Dakota School of Mines graduate program. Upon graduation, he went to work for the US Geological Survey (USGS) in Bismarck, North Dakota in the groundwater office. He then transferred to the USGS's Denver office to work on regional groundwater projects.

After 7 years with the USGS he accepted a position with a local oil and gas company and spent the next 10 years as an exploration geologist working mostly in Rocky Mountain basins. He later returned to the USGS, Yucca Mountain branch, to head the fractured rock program, conducting numerical models of fractured rock systems. He eventually transferred to the Energy Resources group and spent several years conducting oil and gas resource assessments and other research projects.

Larry has volunteered his time to several geologic organizations including SEPM, American Institute of Professional Geologists (AIPG), and Rocky Mountain Association of Geologists (RMAG), all while spending several years as a Little League baseball coach and a volunteer for

a youth equestrian group. He is a 35-year member of AAPG.

Larry became involved with AIPG early in his career, recognizing the importance of communicating with the public as well as other geoscientists. He was elected president and treasurer of the Colorado section, and was chairman of the 1986 annual convention. He was on several AIPG legislative reception committees and was chair of the reception in 1983. In 1985 he received AIPG's distinguished service award.

Larry has been a longtime RMAG member and was the editor of *The Outcrop* newsletter from 1987-1992. He would generate or edit articles of interest to the membership and eventually later focused on articles that dealt with geology and public issues. In 1995 Larry took over the Public Issues Committee and continued the process of informing members about public issues through articles in *The Outcrop*. With a significant time lapse between when an article was written and when members received the newsletter, Larry designed a webpage on RMAG's website that would inform members almost immediately about time sensitive issues, broad conceptual issues, and pending state and national legislation that would affect geologists. Occasionally, an email blast was sent to all members informing them of issues that required their immediate attention.

With a change in website design and administration, Larry and his committee developed an RMAG Public Issue Policy statement outlining the committee's rights and obligations, and Board interaction protocols. This policy statement helped define the committee's future status within RMAG. For his dedicated committee work, Larry received RMAG's Distinguished Service Award in 2012.

Outside the geologic community, Larry had been involved with informing his community about geologic processes related to public policy. He was a science advisor to a Colorado legislative candidate, and has offered his services and science background to several legislative candidates.

In 2001 Larry was appointed to the Jefferson County Colorado Planning Commission, the fourth largest county in the state. He was reappointed several times, served as chairman for 2 years, and finally stepped down after serving with distinction for 14 years. During his time on the commission he helped write master and community plans, land use regulations, and zoning resolutions. These documents included surface and ground water use, oil and gas development, and geohazard recognition procedures. He rendered verdicts and opinions on hundreds of land use cases many of which involved geologic processes, especially in mountain areas.

He also helped the administration of Dinosaur Ridge (near Golden, Colorado) navigate through a planned development that would impact one of the Ridge's building sites.

For more than 30 years Larry has felt a need to inform the geologic community about getting involved in public issues and vice versa. Policy makers and news media usually give science and especially geology a low priority at the table when dealing with public issues. It has been Larry's goal to elevate geology to equal status at the table.

Ruth Anna

DAVID F. MARTINEAU
Public Service Award

Citation—To David F. Martineau, recent chairman of the Texas Independent Producers and Royalty Owners and current member of the Interstate Oil and Gas Compact Commission, and who for several decades has dedicated himself to public service, mainly by educating government officials and the public on the benefits of energy industry, particularly in regards to the Barnett Shale play in Texas' Fort Worth Basin.

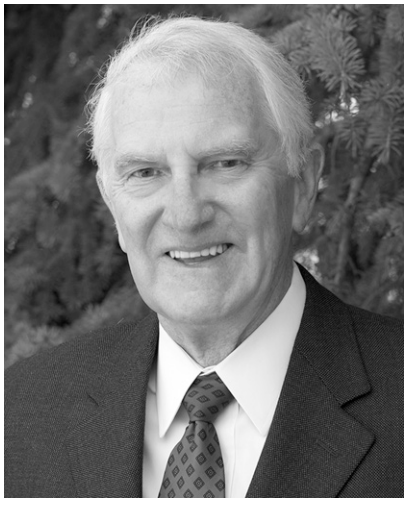
David F. Martineau has been in the oil and gas business as a practicing geologist for 56 years, having graduated from The University of Texas in 1960. He spent his first year as a mud logger for Core Lab then went to work for Costal States Gas Producing Company in Corpus Christi, Texas. In 1969, he moved to Dallas and worked for Prudential Drilling Funds. Prudential closed its Dallas office and in 1972 he went to work in Dallas for L. Frank Pitts, Pitts Oil Company, LLC. He just retired from Pitts after 44 years and is currently consulting for his son's company Martineau Petroleum, Inc.

In addition to his geology work, he began his public affairs work early following in the footsteps of Frank Pitts. In the early 1970s Pitts became the voice of the independents working with TIPRO, IPAA and others in Washington DC and around the country. His goal was to educate the public to encourage legislators to vote for deregulation of natural gas, which finally occurred in 1978. Pitts formed a Speakers Bureau of 30 industry people that gave over 1,100 interviews and presentation through radio, television, newspapers, and speakers.

David was a member of this early group and years later followed Pitts leadership and became chairman of the Texas Independent Producers and Royalty Owners Association. The famous Shale Revolution was active, which was started in the Barnett Shale in the Fort Worth Basin. Since Pitts Oil joined with Mitchell Energy in some of the first Barnett wells in the early 1980s. David used his geological background to give numerous talks to groups like AAPG Southwest Section in an effort to educate the industry and public on the value and potential of shale. As we know the Shale Revolution took off but unfortunately it inspired the anti-oil and gas environmentalist to begin their anti-fracturing campaign across the country. Being the current chairman of TIPRO he was asked to testify before numerous different city council meetings, the Texas Railroad Commission, US House Subcommittee on Energy and Environment, the Environmental Protection Agency and participated in a debate with the wind and solar energy at the National Press Club in Washington DC. He has also been interviewed by local ABC and CBS TV stations and appeared on the national Fox news.

David has enjoyed educating the public, politicians, and environmentalist and has received several awards, Who's Who in Energy from the Dallas Business Journal, Public Service Award from the Dallas Geological Society, the Energy Ambassador's Award from the Texas Energy Council and Industry Legend from *Oil and Gas Investor* magazine.

Tiffany Sellars



LAWRENCE A. MCPEEK
Pioneer Award

Citation—Larry McPeek, a consummate explorer, authored the classic paper on Eastern Green River geology, made multiple discoveries, including Cave Gulch, over a 50+ year career.

Larry McPeek grew up in a small Kansas town in oil country. In a friend's backyard an old steel derrick was fun to climb on and the wooden pumping beam made a good ride. During his college years he worked as a roughneck, roustabout, and a fracturing sand truck driver.

After receiving his B.S. in geological engineering from the University of Kansas in 1959, his first job was as an electric log engineer in Kimball, Nebraska. In 1962 he earned an M.S. in geological engineering from The Colorado School of Mines.

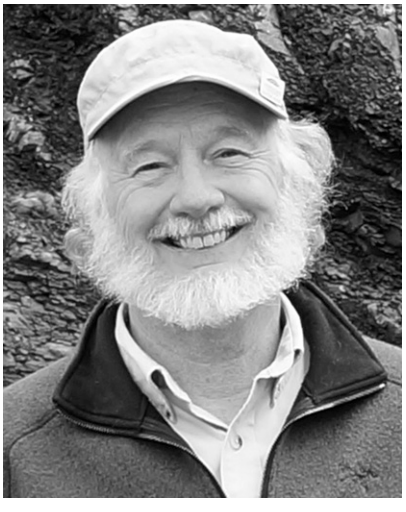
After graduation from Mines, Larry spent 7 years with Pan American Petroleum in Denver and New Orleans, finishing as district operations geologist for the Southeastern District. In 1969 he went to work back in Denver as a geologist for Koch Exploration and

for 2 years, ending in 1972, was Koch's exploration manager for the Rockies. Since 1972 Larry has been a consulting geologist and a prospect generator. In 1991 he became a founding member of Thomasson Partner Associates.

Throughout his career McPeek has been a prolific and creative prospect generator. Two such prospects have brought him particular recognition. In the late 1970s, he was instrumental in causing some of the first deep drilling in the Eastern Green River Basin, and in 1980 was the first to present and publish on the extensive and overpressured nature of this major gas productive province. McPeek's paper, "Eastern Green River Basin: a Developing Giant Gas Supply From Deep Overpressured Cretaceous Sandstones" was, to quote Bob Weimer, "a classic paper." He presented this paper at the 1980 AAPG convention in Denver, and at the RMAG (Best Paper award), WGA, and CSPG.

In 1970 McPeek's involvement with "The Cave Gulch Story" began with his recommendation of a prospect offsetting a Lance producer at the north end of the Waltman field. The prospect was too small to be of interest and was put on the shelf. Reexamining the area in the 1990s, McPeek recognized a much greater potential owing to the feasibility of closer spaced drilling than had been done before and the likelihood of deeper undrilled pays. Both have come about. In 1994 there were 11 producing and abandoned wells at Cave Gulch-Waltman with a cumulative production of 75 BCF. There are now 105 producing or abandoned wells at Cave Gulch-Waltman, which have produced 595 BCF. Enormous volumes of additional gas are likely to be developed in the 18,000 to 20,000 ft depth range when gas prices recover sufficiently. McPeek presented "The Cave Gulch Story, Wind River Basin, Wyoming" (coauthored by M. Ray Thomasson and George E. Newman) to the Rocky Mountain Association of Geologists where it won the 1997 Best Speaker award. The paper also won the AAPG 1997 Levorsen award for best paper at the 1997 Rocky Mountain Section meeting. The paper was also presented at national meetings of the AAPG and SIPES. McPeek was presented with an Outstanding Explorers award in 1996 by the RMAG.

M. Ray Thomasson



BEN GADD
Geosciences in the Media Award

Ben Gadd is one of Canada's better-known naturalists and Rockies writers. Author of the ground-breaking *Handbook of the Canadian Rockies*, Ben has written nine other books and contributed to several more. His novel *Raven's End* has become a prize-winning Canadian bestseller. Ben has received four Banff Mountain Festival awards for his work, as well as the festival's prestigious Summit of Excellence. In 2014 the Geological Association of Canada awarded Ben their E. R. Ward Neale Medal for his many years of sharing Earth science with Canadians.

After earning a degree in earth science, Ben has pursued a career mainly in natural history, including a stint as a Parks Canada naturalist. He has also taught writing at the Southern Alberta Institute of Technology and Grant MacEwan College. For nearly 30 years he has worked in the summer as a freelance interpretive guide—one of only 11 guides accredited as master interpreters in Canada's professional Interpretive Guides Association—and in the winter as a writer and sought-after lecturer on Rockies topics. He also produces interpretive signs for national and provincial parks. Lately he has been preparing museum exhibits.

Heard from time to time on CBC radio, Ben has also appeared in many television items and several documentaries on the Rockies. He supports various conservation groups in promoting wilderness protection. After 29 years in Jasper, in 2009 Ben and his wife,

Cia, moved to Canmore to be Grandpa and Grandma across the yard from Marie and Rose.

KIRK JOHNSON
Geosciences in the Media Award

Kirk Johnson is the Sant Director of the Smithsonian National Museum of Natural History. He oversees more than 460 employees and a collection of more than 128 million objects—the largest natural history collection in the world. The Museum hosts more than 7 million visitors annually and, last year, its scientists published over 730 scientific research papers and described 517 new species.

Johnson is a paleontologist who has led expeditions in 11 countries and 19 states that resulted in the discovery of more than 1,400 fossil sites. His research focuses on fossil plants and the extinction of the dinosaurs. He is known for his scientific books and articles, popular books, museum exhibits, presentations, and collaborations with artists. In 2010-2011, he led the Snowmastodon Project, the excavation of an amazing ice age site near Snowmass Village, Colorado. This dig recovered more than 5,400 bones of mammoths, mastodons and other ice age animals and was featured in the NOVA documentary, *Ice Age Death Trap*, and in Johnson's book, *Digging Snowmastodon, Discovering an Ice Age World in the Colorado Rockies*. Johnson also hosted the three-part NOVA series *Making North America*, which aired on PBS networks in November 2015.

Before coming to the Smithsonian, Johnson was vice president and chief curator at the Denver Museum of Nature and Science, where he established the museum's first comprehensive, long-term research and collections plan. Johnson holds numerous professional memberships, and in November 2013, was appointed by the White House Office of Science and Technology Policy to the Interagency Arctic Research Policy Committee. He is a member of National Geographic's Committee for Research and Exploration and an elected Fellow of the Paleontological Society.

Johnson is originally from Bellevue, Washington, and has a bachelor's degree in geology and fine art from Amherst College, a master's degree in geology and paleobotany from the University of Pennsylvania and a doctorate in geology and paleobotany from Yale University. He completed postdoctoral research at the University of South Australia and served as a Crosby lecturer at the Massachusetts Institute of Technology.

IAN MILLER
Geosciences in the Media Award

Ian Miller is Curator of Paleobotany and Director of Earth & Space Sciences at the Denver Museum of Nature & Science. In addition to running the Earth Sciences Department, he is in charge of the world-class collection of fossil plants at the Museum. His research focuses on fossil leaves and their applications for understanding ancient ecosystems and climate. He is presently working on projects in the Colorado Rockies and along the Colorado Front Range, the Grand Staircase Escalante National Monument in Utah, the San Juan Basin in New Mexico, the Williston Basin in North Dakota, and the Morondova Basin in Madagascar. Along with Kirk Johnson at the

Smithsonian, and Jeff Pigati at the US Geological Survey, Ian led the Snowmastodon Project. Ian received his Ph.D. and M.A. in geology and paleobotany from Yale University, and his BA from The Colorado College. He has been with the Museum since 2006.

CHRISTOPHER A.-L. JACKSON
Wallace E. Pratt Memorial Award

DANIEL T. CARRUTHERS
Wallace E. Pratt Memorial Award

SESHANE N. MAHLO
Wallace E. Pratt Memorial Award

OMIEARI BRIGGS
Wallace E. Pratt Memorial Award

The Wallace E. Pratt Memorial Award for the best paper published in the *AAPG Bulletin* is presented to Christopher A.L. Jackson, Daniel T. Carruthers, Seshane N. Mahlo, and Omieari Briggs for "Can polygonal faults help locate deep-water reservoirs?" (v. 98, p. 1717–1738).

Polygonal faults are one of the most enigmatic types of structures documented in deep-water sedimentary basins. Their genesis has been hotly debated and, after almost 20 years of research, remains contentious. Rather than try to constrain their genesis we decided to ask another question; can polygonal faults help locate deep-water reservoirs? Using 3-D seismic and borehole data from offshore Norway we were able to map a sandstone-rich, deep-water fan gas reservoir and show that the distribution of and throw on polygonal faults developed in encasing mudstones were strongly controlled by the fan. We were thus able demonstrate that polygonal faults are not simply an academic curiosity; mapping of these enigmatic structures can have practical applications for the delineation of a variety of reservoir types in hydrocarbon-bearing sedimentary basins worldwide. We encourage hydrocarbon exploration geoscientists to try and apply the techniques outlined in this paper to their own datasets.

It is important to point out that this was truly a group effort; Seshane conducted part of the analysis contained in this paper while an undergraduate, during a university-funded UROP-funded research placement (Universities Research Opportunities Program), whereas Omeari conducted her part of the analysis while undertaking an M.Sc. in petroleum geoscience. This paper thus highlights the key role that undergraduate and M.Sc. students

play in undertaking and writing-up industry-relevant research.

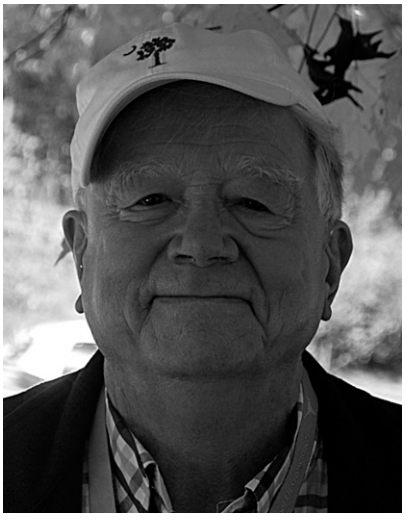
Christopher Jackson is the Statoil Professor in Basin Analysis in the Department of Earth Science and Engineering, Imperial College, United Kingdom. He obtained a B.Sc. (geology) and Ph.D. (rift basin structure and stratigraphy) from the University of Manchester, prior to working as a research geoscientist at Norsk Hydro (now Statoil) in Bergen, Norway. Since taking up an academic position at Imperial College, his research interests have included the tectonostratigraphic evolution of rifts and the application of three-dimensional seismic data to understanding the formation and filling of sedimentary basins. He has authored and co-authored more than 90 peer-reviewed articles. He served as associate editor of *Basin Research* (2010-2013) and senior editor of *AAPG Bulletin* (2010-2013). In 2013 he toured as the Allan P. Bennison Distinguished Lecturer for AAPG.

Daniel Carruthers is a structural geologist with research interests in salt tectonics, fault kinematics, basin geodynamics, and exploration geology. He holds an M.Sci. in geosciences from Durham University, UK and a Ph.D. in structural geology from Cardiff University, UK. As part of his Ph.D. studying salt tectonics in the Central North Sea he undertook two internships at Shell in Aberdeen. After obtaining his Ph.D. in 2012, Daniel moved to Austin, Texas where he worked as a post-doctoral research fellow in the Applied Geodynamics Labratory at the Bureau of Economic Geology. His research project focused on salt tectonics along the southeast Brazilian continental margin and the tectonic evolution of the South Atlantic. In 2015, he moved back to the UK where he currently works as an exploration geoscientist for CGG Multi-Client New-Ventures: GeoSpec Team.

Seshane N. Mahlo is currently a production engineer at Statoil ASA. She is a graduate of Imperial College London and an Associate of the Royal School of Mines. It was here that she was introduced to Christopher Jackson, her personal tutor throughout her undergraduate studies. He would then become her supervisor during her research on using polygonal faults mapped in a three-dimensional seismic cube to locate deep-water reservoirs. She went on to pursue an M.Sc. petroleum engineering degree, during which she researched the ability to simulate hydraulic fracturing in layered and foliated rocks using FEMDEM models.

Omieari S. Briggs is currently a geoscience product specialist with Roxar, a business unit of Emerson Process Management in Stavanger, Norway. She has a B.Sc. Hons degree in geology from the University of Port Harcourt, Nigeria (2002), an M.Sc in applied environmental geology from Cardiff University, Wales, U.K (2005) and another M.Sc in petroleum geoscience from Imperial College London, U.K (2011). Briggs was born and raised in Port Harcourt, River State. Being surrounded by the petroleum industry, she developed an interest for oil and gas related matters. She was inspired and chose a career in science. She went on to study geology as a first degree from the University of Port Harcourt. Her B.Sc thesis was focused on aspects of environmental geology. She moved to the UK to pursue a master's degree in applied environmental geology. She graduated with a Distinction from the Cardiff University in Wales and later moved to Stavanger, Norway with her family as a result of her husband's job. Being surrounded once more by the oil and gas industries in Stavanger, that old flame was fanned again. This prompted her to go for further studies to fully integrate in the field of petroleum and so she embarked on an M.Sc. program in petroleum geoscience from Imperial College London.

LISA MARLOW
Robert H. Dott, Sr. Memorial Award



CHRISTOPHER C. G. KENDALL
Robert H. Dott, Sr. Memorial Award

LYNDON A. YOSE
Robert H. Dott, Sr. Memorial Award

The Robert H. Dott, Sr. Memorial Award is presented to honor and reward the author/editor of the best special publication dealing with geology published by the Assocation. This year's ward is presented to Lisa Marlow, Christopher C. G. Kendall, and Lyndon A. Yose for *AAPG Memoir 106 Petroleum Systems of the Tethyan Region*.

AAPG Memoir 106 is intended to generate ideas for the future exploration of immature and mature basins across the Tethyan Region. From the Paleozoic to the Cenozoic, the Arabian Plate, North Africa and parts of Southern Eurasia, were on the margin of a series of Tethys seaways, Proto-Tethys, Paleo-Tethys, and Neo-Tethys. These areas evolved together and as a result they have numerous similarities in their tectono-stratigraphic history and petroleum systems.

These similarities could be used to extrapolate proven petroleum systems to underexplored areas and lead to hydrocarbon discoveries. The back cover illustrates the countries that evolved along the Tethyan Region in their present day location. Countries covered in this volume are outlined.

Lisa Marlow is an exploration geologist at Halcon Resources with a focus on delivering resource plays in the oil window. Prior to joining Halcon Resources she worked as an exploration geologist with Shell on unconventional and conventional resources in the Onshore Gulf Coast and New Ventures Deepwater. Her work at Shell included identification and maturation of play concept to post-drill well analysis as lead geologist and operations geologist. Prior to Shell she evaluated the tectono-stratigraphic history and petroleum potential of the Levantine basin using industry data and software (courtesy of 2-D seismic from TGS and PetroMod licensure from IES/Schlumberger) as her Ph.D. project at the University of Minnesota. Prior to getting into the oil industry she was president of Marlow Geoservices, LLC. This company focused on exploring for and mapping sand and gravel resources. Lisa has her M.Sc. from the University of Minnesota where she specialized in glacial geology, geomorphology, and post-glacial aeolian deposits.

Christopher C. G. Kendall is a consulting geologist, editor of the SEPM STRATA web site and Distinguished Emeritus Professor, Earth & Water Sciences Dept., University South Carolina. His consulting and research involves high-resolution sequence stratigraphy, facies, petrophysics, and the controls on carbonates, evaporites and clastic systems of the Holocene though Mesozoic, and Paleozoic, specifically of the Arabian Peninsula and Gulf but also worldwide. He is developer of computerized sequence stratigraphic simulations of carbonate and clastic systems as they relate to eustatic, tectonic and sedimentation controls. His career has mixed both oil industry and academia resulting in multi-authored 454 scientific publications.

Lyndon A. Yose received an M.S. degree in geology from the University of Wyoming and a Ph.D. from Johns Hopkins University. He is a technical advisor at ExxonMobil with a focus on sequence stratigraphy as a tool for carbonate reservoir characterization, performance prediction and management. To this end, Lyndon has worked and published on outcrop analog studies in the Italian Alps, northern Turkey and Oman, and on

integrated subsurface studies in the Middle East (Iraq, Qatar, Abu Dhabi), North Caspian, west Texas and the Western Canada Basin. His career with ExxonMobil has included alternating assignments in research, field development and production settings, with postings in Houston, Calgary and Doha, Qatar.

ROBERT J. HELLER
J. C. "Cam" Sproule Memorial Award

JOHN VERMYLEN
J. C. "Cam" Sproule Memorial Award

The J. C. "Cam" Sproule Memorial, presented to the author(s), age 35 or younger at the time of submittal, in recognition of the best paper published by the Association or any affiliated society, division, or section, is awarded to Robert J. Heller and John Vermylen for "Experimental investigation of matrix permeability of gas shales" (*AAPG Bulletin*, v. 98, p. 975–995).

This paper addresses the difficult problem of measuring effective permeability in very fine-grained rocks. This research topic is of high relevance as it directly pertains to long-term performance prediction in shale gas reservoirs. In this study laboratory measurements were made on samples of various shale reservoirs to examine the effects of confining stress and pore pressure on permeability and to determine how permeability changes with depletion. This paper not only supplies important new data to understand the permeability of shales, it also considers the problems and errors associated with making these measurements in the lab. What sets this paper apart is not only the science that is reports, but the clarity of the writing that makes this work readily accessible to the generalist.

Mark Zoback was a coauthor of this paper.

Robert Heller earned his Ph.D. in geophysics from Stanford University in 2013. His thesis was titled "Multiscale Investigation of Fluid Flow in Gas Shales", and his adviser was Mark Zoback. He earned his M.S. degree in engineering from Stanford University in 2008, and B.S. degree from Columbia University in 2007. He currently works as a geomechanics specialist at BP.

John P. Vermylen received his B.A. in geosciences from Princeton University in 2005. In 2011 he received his Ph.D. in geophysics from Stanford University. His dissertation was titled "Geomechanical Studies of the Barnett Shale, Texas, USA." From 2011 to 2014 he worked for McKinsey & Company, working on consulting projects with clients across the oil & gas, mining, aerospace, and technology industries. Since 2014, he has worked for A. Zerega's Sons Inc. of Fair Lawn, New Jersey, America's first and oldest pasta manufacturing company, founded by his great-great-great grandfather in 1848.

RONALD C. BLAKEY
John W. Shelton Search and Discovery Award

Ronald C. Blakey received the John W. Shelton Search &

Discovery Award for the most outstanding contribution to the AAPG Search & Discovery website titled "Paleogeography and Paleotectonics of the Western Interior Seaway, Jurassic-Cretaceous of North America"

The contribution was adapted from an invited talk presented to the Tulsa Geological Society in October 2014. It presented the latest information on the evolution of the Jurassic-Cretaceous Western Interior Seaway (WIS), western North America. It is one of the few contributions of this type that covers both the Canadian and United States portions of the seaway. The southeast margin of the study area extends into the Gulf of Mexico-Gulf Coast region and the western margin extends into the Pacific realm thus tying together many of the important Jurassic-Cretaceous regions of North America. The paleogeographic maps show the detailed shorelines and their transgressive-regressive nature as well as the surrounding landscapes that supplied sediment to the seaway. Facies maps and chronostratigraphic cross sections provide additional data.

Coarse to fine sediment was supplied from the Sevier orogenic belt to the west and included recycled sedimentary rocks from the thrust belt and igneous material from the active Cordilleran arc. Extensive volcanic ash beds are preserved in fine-grained rocks. Sand and mud were supplied by the North American craton to the east. Limestone was deposited in clear, offshore settings. The sedimentary deposits of the WIS contain an extensive marine and non-marine biota that is critical in the establishment of regional correlation. Absolute age dates are obtained from interbedded ash beds and detrital zircon analysis.

Well-developed asymmetric transgressive-regressive cycles dominate the stratigraphic patterns. Sequences were controlled by sediment supply rates, global sea level, subsidence/uplift rates, and regional eustatic events. Most cycles are skewed towards the preservation of regressive sequences; an overall regressive pattern dominates from the Campanian through the seaway's demise at the end of the Maastrichtian.

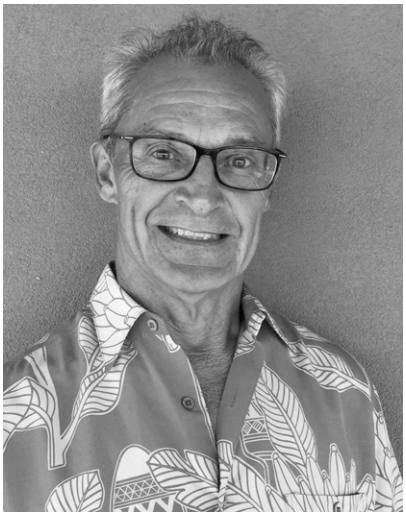
The tectonic controls are clearly shown including the accretion of terranes to the adjacent Cordilleran Region. The nature and evolution of the Western Interior basin is also shown on the maps and described in the text. From the Middle Jurassic through the Coniacian, Cordilleran subduction, magmatism, and thrusting generated a classic retro-arc foreland basin that orchestrated subsidence and sedimentation patterns in the Western Interior Basin that in turn controlled the geometry of the Western Interior Seaway. However, from the Santonian through the Maastrichtian, subsidence and sedimentation patterns changed in response to shallowing subduction angles and subduction of a thick oceanic slab. The subducted slab eventually caused regional uplift, partitioning of the Western Interior Basin into Laramide uplifts and basins, and withdrawal of the Western Interior Seaway.

A study of this magnitude would not be possible without the voluminous database for rocks deposited in the WIS. Excellent, widespread outcrops, robust subsurface data, abundant radiometric data, and unequalled biostratigraphic data allow for this type of comprehensive study.

Rocks of the WIS are significant for a number of reasons: vast resources of petroleum and coal; important fossil resources including dinosaurs, ammonites, and forams; the foundations for critical academic studies concerning principles of transgression/regression/sequence stratigraphy, and biostratigraphy; significant scenic resources for many national Parks and other recreation areas.

Ron Blakey is recently Professor Emeritus at Northern Arizona University following 34 years of teaching and research in the Department of Geology. During his tenure at NAU, he studied and published on the stratigraphy and sedimentology of many Late Paleozoic and Mesozoic rock units on the Colorado Plateau. His specific interests are eolian and fluvial depositional systems. This nurtured his interest in

paleogeography and for the last 15 years, he has been heavily involved in producing paleogeographic maps that range from regional to global in scope. Many of these maps appear on his web site, cpgeosystems.com. His latest endeavors have merged these two disciplines into books published by the Grand Canyon Association, *Ancient Landscapes of the Colorado Plateau* and Springer, *Plate Tectonics, Continental Drift, and Mountain Building*. His degrees are from Wisconsin (B.S.), Utah (M.S.), and Iowa (Ph.D.).



JEREMY JAMESON
George C. Matson Memorial Award

The George C. Matson Memorial Award for the best paper presented during an oral technical session at the Annual Convention and Exhibition is presented to Jeremy Jameson for "Textural types of evaporites in Holocene sabkhas of Qatar and their geological significance."

This paper describes common textural types of evaporites occurring in Qatar, their origins and manner of occurrence. The growth habits and distribution of evaporite minerals in sabkhas of Qatar provide insights in their origins and models for the interpretation of ancient evaporites. Rates of evaporation exceed precipitation by a factor of 1000 for six or more months of the year. In such an arid climate, bodies of standing water and evaporation in the capillary fringe promote rapid formation of evaporites. The most obvious textural differences occur between subaqueous mineral phases deposited in standing water, those formed in the capillary fringe, and precipitates near the water table.

All styles of evaporite cementation are driven by extreme aridity of the climate. Millimeter sized crystals can grow in a few months, a geological instant. Limiting factors on growth rates of evaporites are seasonal water chemistry fluctuations and in some cases, limited supply of marine waters. Surface evaporites in Holocene export plumes into underlying bedrock.

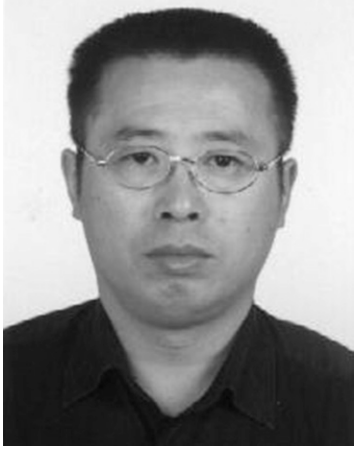
Jeremy has spent much of the last 15 years studying the depositional and diagenetic setting of the evaporite-carbonate coastal sabkhas of Qatar. He is a carbonate specialist, with over 30 years experience in development and exploration of carbonate reservoirs worldwide. He is presently CEO of Limeaide Carbonate Consultants. He holds an A.B. n geology from Indiana University and a Ph.D. in geology from University of Edinburgh.

XUEJUN WANG
Jules Braunstein Memorial Award

LIRONG DOU
Jules Braunstein Memorial Award

YUGUANG ZHAO
Jules Braunstein Memorial Award

DEMIN MAO
Jules Braunstein Memorial Award



QUNWEI ZHANG
Jules Braunstein Memorial Award

XIAODONG WEI
Jules Braunstein Memorial Award

The Jules Braunstein Memorial Award for the best poster presention at the AAPG Annual Convention and Exhibition is presented to Xuejun Wang, Lirong Dou, Yuguang Zhao, Demin Mao, Qunwei Zhang, Xiaodong Wei for their poster "Fractured granitic basement reservoir discoveries in the Bongor Basin of Chad."

The Precambrian naturally fractured granite basement reservoir discovery in the northern slope of the Bongor basin of Chad in the end of 2012 was a milestone in the oil potentiality of new exploration play in the Africa onshore exploration. Subsequently, eight fractured basement prospects have been identified and five have been proven oil and gas with total areas over 400 km^2. Basement reservoir is divided into 4 zones and charged and capped by the Lower Cretaceous shale with the thickness up to 1 km, TOC 3.5%, HI from 300 to 600 mg/g. The effective porosity ranges 4 - 12%, occasionally up to 30%. The hydrocarbons largely present lateral migrating along faulted-hills or rotated horst blocks from structurally low positions in the grabens. The oil column is up to 1500 m high and the crude oil is characterized by light oil.

Low frequency seismic survey better images the top surface of the buried hills and results in significant improvement on reservoir characterization and delineating the fracture geometry within granitic basement play in Bongor basin of Chad.

Xuejun Wang became a president of BGP Geophysical Research Institute in 2008. He received a B.S. in geophysical prospecting from China Yangtze University (former Jianghan Petroleum University) in 1984 and Ph.D. in petroleum geology from China Northwestern University in 2001. He joined BGP Inc. of CNPC after graduating in 1984 and began his career as a seismic acquisition data quality controller in seismic crow during 1984-1985, and later he worked in the seismic data processing and interpretation as well as geology study. His research interests focus on basin tectonic analysis and petroleum system, seismic data processing and interpretation and low-frequency exploration and application. He is a member of SEG and a visiting professor in China Yangtze University from 2012 to 2015. Now he is a professor expert on petroleum prospecting in China National Petroleum Corporation (CNPC).

After working in Research Institute of Petroleum Exploration and Development 10 years, Lirong Dou joined China National Oil and Gas Exploration and Development Corporation (CNODC) in 2004 to participate in their exploration and research programs as senior geologist and deputy director of the African Exploration, CNODC. He was the general manager of CNPC International (Chad) Co., Ltd. during 2007-2013, chief geologist of CNODC

during 2013-2015, and then the vice president of CNPC International (Nile) Ltd.

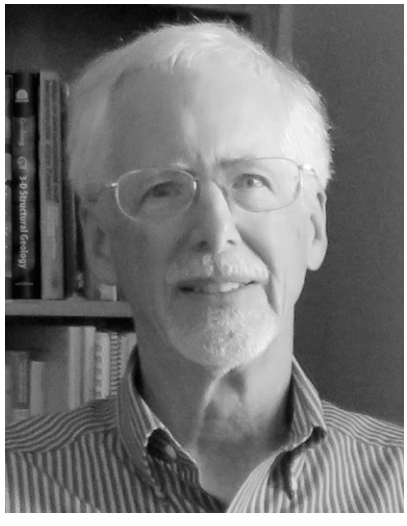
Yuguang Zhao, senior geologist, graduated from Peking University with geology bachelor degree in 1986 and RIPED with petroleum geology master degree in 1989. Zhao has been working in geological and geophysical study for over 25 years at BGP, and is focus on seismic data interpretation, reservoir characterization, and comprehensive geological study.

Demin Mao, senior geologist, graduated from Chengdu University of Geology with a bachelor's degree in 1985 and master's degree in 1992. He has been working at BGP for nearly 30 years. From 2010 to 2014, he was mainly engaged in seismic data interpretation and geological comprehensive analysis on Bongor Basin in Chad.

Xiaodong Wei, a member of SEG and SPG, graduated from China University of Petroleum with a bachelor degree in Petroleum Geology, senior engineer designation. Wei has been working in seismic interpretation and integrated geology study since 1995 in BGP. He interest in seismic attribute, reservoir prediction, petrophysics, with over 20 papers published in major academic journals.

Qunwei Zhang, senior geologist, graduated from Changchun University of Geology with geology master degree in 1989. Zhang has been working in geological and geophysical study for over 25 years at BGP, and is interested in oil exploration, seismic data interpretation, reservoir characterization, and comprehensive geological study.

DAVE HALE
SEG/AAPG Best Paper in *Interpretation* Journal Award



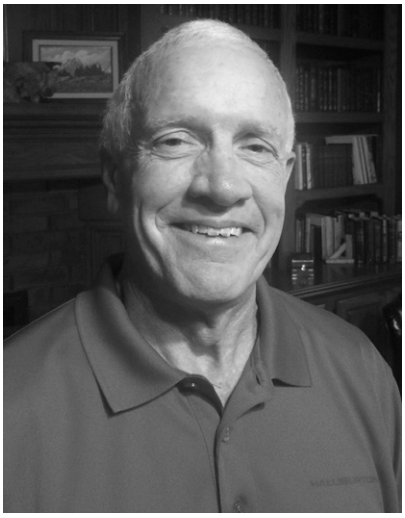
RICHARD H. GROSHONG
SEG/AAPG Best Paper in *Interpretation* Journal Award

Dave Hale and Richard H. Groshong have been recognized for their authorship of the best paper published in the SEG/AAPG *Interpretation* journal titled "Conical faults apparent in a 3-D seismic image" (v. 2, no. 1, p. T1-T11).

This paper is the result of a collaboration between a longtime SEG member and geophysicist, Dave Hale, and a longtime AAPG member and structural geologist, Rick Groshong. Dave had developed seismic-image processing methods for automatically extracting fault surfaces and estimating fault slips, and was trying to understand why some faults imaged in a 3-D seismic survey from the North Sea were conical in shape. Such a shape seems to be unusual enough that an unaided human interpreter might not recognize it. A geophysicist and mutual friend, Ken Larner, brought Dave and Rick together in the Colorado mountain town of Tabernash, where they first began working toward a manuscript for publication in Interpretation. The paper proposes a mechanical explanation for the origin of conical normal faults that is consistent with the origin of the surrounding polygonal normal faults. We are grateful to have received encouragement, comments, and suggestions from many others, as well as reviewers. Our own private review process was simple. When Dave and Rick understood each other, the paper was ready to be submitted.

Dave Hale has worked as a field seismologist and research geophysicist for Western Geophysical, as a senior research geophysicist for Chevron, as an associate professor at the Colorado School of Mines, as a chief geophysicist and software developer for Advance Geophysical, and as a senior research fellow for Landmark Graphics. In 2005 he returned to Mines as the C.H. Green Professor of Exploration Geophysics, where he worked with the Center for Wave Phenomena until retiring in 2015. Dave now writes computer software with Dean Witte. Hale earned a B.S. in physics from Texas A&M University and a Ph.D. in geophysics from Stanford University.

Rick Groshong specializes in the structure of sedimentary rocks. He has numerous publications on the deformation mechanisms of sedimentary rocks, balanced cross sections, forward modeling of structural geometries, and is the author of the textbook, *3-D Structural Geology*. He has served as chairman of the Structure and Tectonics Division of the Geological Society of America, an AAPG Distinguished Lecturer, and is currently a senior associate editor for the *AAPG Bulletin*. He has a B.S. from Bucknell University, a M.A. from The University of Texas at Austin, and a Ph.D. from Brown University.



CHARLIE SMITH
Gabriel Dengo Memorial Award

The Gabriel Dengo Memorial Award is given each year in recognition of the best paper presented at the previous year's AAPG International Conference and Exhibition. This year, the award is presented to Charlie Smith for "Nuclear magnetic resonance response to textural reservoir changes."

Carbonate reservoirs, without alteration, are generally dense, low porosity formations that have low porosity on standard porosity measurements from density and neutron logs. These reservoirs may have alteration features that occur after deposition. Extensive secondary porosity features are evident in many productive carbonate reservoirs in the world. These secondary features may take the form of vugs, fractures, or a combination of these.

These features significantly change the ability of the reservoir to produce. In some cases, the porosity log response from density/neutron measurements can be affected by these alterations but generally, this is not the case. Porosity from both of these devices is measured by estimating the void space from correlations. In formations with significant and non-uniform alteration, correlation to actual formation parameters can be difficult.

Image logs were added to logging runs in order attempt to identify and quantify secondary events in carbonate formations. Image logs can generally identify the presence of these fractures and vugs, but their contribution to permeability cannot be evaluated. The connectivity of these alteration features cannot be determined by the image alone.

Magnetic resonance (MR) logs were added to logging programs to assist in direct identification of the quantity and quality of these alterations. An MR measurement is the only logging measurement that measures the area of void space available and quantifies it. This is a direct measurement of effective porosity.

The full core taken in this Mississippian carbonate reservoir exhibited significant secondary porosity features. MR logs were also acquired in this well. These MR logs evaluated both the porosity and permeability in this section. The identification basis for secondary porosity identification in this reservoir is 256 ms or later. There are portions of the logs where significant measurements of 512 ms and later are identified. The volume and quality of the alteration is identified by the contribution to total porosity of these late relaxation events.

Magnetic resonance measurements of polarization

(T_1) and relaxation (T_2) provide a significant amount of useful information in reservoirs with great textural variation. The data shown in this paper relates specifically to a dense carbonate, but the application can be used in any reservoir.

Permeability can be calculated when a time discriminated measurement can be made of relaxation. An accurate time discriminated T_2 can only be accomplished when complete measurement of the time spectrum is accomplished. Based on the antenna for the specific MR device in use, logging speed should be adjusted to accomplish this objective.

The Bray-Smith permeability equation can be used to approximate the permeability, even in highly variable rock. In this reservoir, whenever portions of porosity were represented by 256 ms and later, secondary porosity events were present. The calculation provides for a greater contribution to permeability from those late time events than similar porosity measurements of earlier T_2 time.

The additional information obtained from MR secures a log product that provides a general quantification of secondary porosity reservoir properties without the expense of coring.

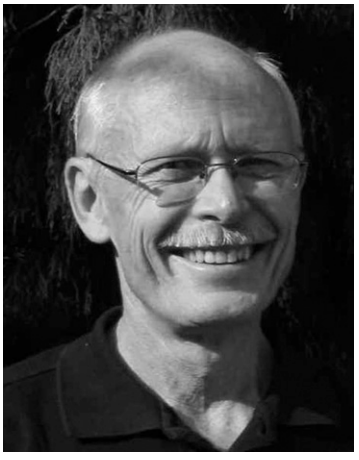
Charles H. (Charlie) Smith was born, raised, and graduated from high school in Arizona. He served for 4 years in the United States Army in the 82nd Airborne Division during the Vietnam conflict. Awards included Meritorious Service Medal, Army Commendation Medal, Good Conduct Medal, National Defense Service Medal, Senior Parachute Badge, Expert (M-16) Badge, and Distinguished Graduate of the XVIII Airborne Corps NCO Academy.

He received a B.S. in mining engineering from the University of Arizona. He worked 18 years for Schlumberger starting as a field engineer then continuing in sales and management, eventually managing the Rocky Mountain region for the Flopetrol-Johnston subsidiary. During his time at Schlumberger, he was awarded seven of the prestigious "Wildcatter" awards for log analysis leading to the discovery of productive reservoirs. He joined Halliburton in 1999 and retired in 2015. He cowrote the Bray-Smith equation for magnetic resonance T2 bin distribution derived permeability and has written or been co-author on over 70 different technical papers presented at SPE, AAPG, SPWLA, SEG, GSA, IPTC, and EAGE conferences throughout the world. These papers have focused on permeability and fluid typing from magnetic resonance responses and application of dipole sonic data for completion efficiency utilizing vertical and horizontal rock mechanical properties. Four of these papers were selected as Top Ten presentations in the various conferences. He has previously served as a board member for the SPE Production Operations Symposium in Oklahoma City and as session chair in several conferences. He has served as a steering committee member, lecturer, and instructor at various AAPG GTW and Education Week events throughout North America.

Charlie is very active in his church and in his community. He and his wife Phyllis have 8 children and 22 grandchildren and have lived in Edmond, OK for 25 years.

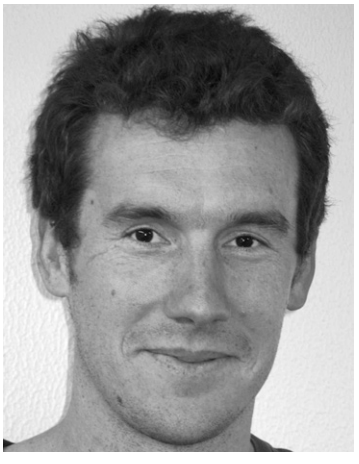
ANGELA G. GRIFFIN
Ziad Beydoun Memorial Award

KYLE J. BLAND
Ziad Beydoun Memorial Award



BRAD FIELD
Ziad Beydoun Memorial Award

DOMINIC P. STROGEN
Ziad Beydoun Memorial Award



GARETH CRUTCHLEY
Ziad Beydoun Memorial Award

MARK J. LAWRENCE
Ziad Beydoun Memorial Award

RICHARD KELLETT
Ziad Beydoun Memorial Award

The Ziad Beydoun Memorial Award is given each year in recognition of the best poster presented at the previous year's AAPG International Conference and Exhibition. This year, the award is presented to Angela G. Griffin, Kyle J. Bland, Brad D. Field, Dominic P. Strogen, Gareth J. Crutchley, Mark J. F. Lawrence, and Richard Kellet for "Reservoir characterization of the East Coast and Pegasus Basins, Eastern North Island, New Zealand."

Over 300 known onshore oil and gas seeps occur in eastern North Island, New Zealand, indicating an active petroleum system. Exploration since the 1880s has led to more than 40 wells being drilled onshore, and although only three have been drilled offshore all had significant gas shows. Reservoir distribution and quality is seen as a key risk in the basin. This integrated study focuses on the reservoir characteristics of the East Coast and Pegasus basins, located on- and offshore eastern North Island, New Zealand. This project assesses the reservoir potential of likely Neogene formations in both onshore and offshore parts of the basins, through the integration of paleogeographic maps, seismic interpretations, petrophysical analysis of both conventional wireline and FMI image logs in exploration wells, and poro-perm analysis. Integration of onshore/outcrop analogues with subsurface data sets (e.g. wireline logs, seismic interpretation) is undertaken, with the aim of building a model for predicting reservoir distribution and quality in the region.

Angela Griffith is a geologist in the Department of Petroleum Geoscience, at GNS Science, Wellington, New Zealand. She has spent most of her geoscience career working at GNS, starting off as a technician, before becoming a geologist, specializing in borehole image and geophysical log interpretation and analysis. She has worked on a variety of projects in

many of New Zealand's petroleum basins, including underground CO2 sequestration, borehole image and wireline log analysis, and reservoir and seal potential of Taranaki and East Coast basins. She received her M.Sc. (Hons) in earth science and geography from University of Waikato, New Zealand in 2001 and her B.Sc. in earth sciences and geography from University of Waikato in 1999.

Kyle Bland is a sedimentary geologist/stratigrapher, who joined GNS Science in 2007. A Ph.D. graduate of the University of Waikato (Hamilton, New Zealand), he has a background in sedimentology, sequence stratigraphy, paleontology, and geological mapping. Kyle currently leads the New Zealand government-funded "Atlas of Petroleum Prospectivity" research program and "Frontier Basins taskforce" research project. His current research and consultancy work includes developing paleogeographic reconstructions of eastern and central New Zealand, de-risking the petroleum systems elements outside in New Zealand's many frontier basins. Kyle has also been involved with regional assessments of the potential for underground storage of CO2 in the East Coast, Taranaki, Wanganui, Waikato, and Western Southland basins.

Brad Field has 40 years experience as a research and consulting geologist, mainly in the field of sedimentology, with applications in sedimentary basin analysis, reservoir and seal evaluation, CCS and paleoclimate studies.

Dominic Strogen is a sedimentary geologist. He holds a B.Sc. degree (1st class) in geology, an M.Sc. (Distinction) in petroleum geology, and a Ph.D. He is a member of the Petroleum Exploration Society of Great Britain, the Geological Society of New Zealand, and AAPG.

Gareth Crutchley is a marine geoscientist who specializes in controlled-source seismic methods and numerical modeling, which he uses to investigate natural gas hydrate systems. In particular, he investigates processes surrounding fluid flow towards and through gas hydrate-bearing sediments and the influence this has on hydrate formation and dissociation as well as on the stability of submarine slopes. His research integrates geological processes ranging from tectonic deformation to gas hydrate stability and submarine slope stability.

Mark Lawrence is a Senior Geologist with GNS Science where he works on CO_2 sequestration, hydrocarbon and geothermal projects. In 1990 Mark did a brief post-Doctoral stint at the University of Aberdeen, investigating UK Carboniferous stratigraphy. This was followed by 14 years with Baker Hughes, Aberdeen, Scotland, working on core and borehole image data interpretation (wireline and LWD) and integration, in sedimentological, ichnofabric and environmental analysis of fluvial-deltaic to shallow marine clastic sediments and carbonates. At Baker Hughes, he had regional and global responsibilities that included production of interpretation reports to clients, and training and mentoring newly hired geologists. In 2008 Mark returned to New Zealand to join GNS Science

Richard Kellett is a senior geoscientist in the Marine Department at GNS Science in New Zealand. He specializes in the interpretation of seismic and other geophysical data on New Zealand's extended continental shelf. Prior to joining GNS in 2015, Richard worked as a senior geophysicist for New Zealand Energy Corp., Sherritt International, and Pioneer Natural Resources Canada. In addition to Richard's geophysical interpretation skills he has worked in senior management for Sherritt International. Richard has a background in geophysical research having spent 10 years in Australian and Canadian Universities working on investigations of crustal scale structures. Richard is a professional geoscientist in the Province of Alberta.

WILLIAM E. GIPSON
L. Austin Weeks Memorial Medal

The L. Austin Weeks Memorial Medal is given in recognition for

extraordinary philanthropy and service directed to advance the mission of the AAPG Foundation. The 2016 recipient is William E. Gipson.

Gipson's philanthropy and service to the Foundation began more than 40 years ago in 1974 with his first gift to the Foundation. In 1977 Gipson joined a small group of donors who became the Founding Members of the Trustee Associates, officially recognized as the Foundation major donor group in 1978. The Trustee Associates were formed to raise money to permit the Foundation to pursue its goals and objectives, to recognize those individual who provide substantial financial support and to serves as an advisory body to give advice and counsel to the members of the Board of Trustees. This University of Texas at Austin graduate (1949) could not have known at the time how he would demonstrate the purpose of the group through his lifetime of service to the Foundation. Gipson a strong promoter of the Trustee Associates and Foundation served as vice-chair from the group in 1988 and as the chair in 1990.

His service to the Foundation did not stop there; in 1996, Gipson was appointed as a Regular Member of the Members of the Corporation and in 2006 was elected as a Trustee, a position he held for 16 years. During his time as Trustee, he provided leadership and guidance as Treasurer and as Chairman to the Foundation Audit Committee.

Gipson played a key role in the Foundations "Meeting Challenges … Assuring Success" capital campaign as a team leader on the Foundations Financial Campaign Committee in 2006. This campaign raised over $35M in contributions for the Foundation over the next 6 years.

Gipson's philanthropic legacy has provided support for a variety of Foundation program over the years, including the Treatise of Petroleum Geology and Tectonic Map programs, support for building funds for the Weeks and Pratt Towers, Distinguished Lecture and Grants-in-Aid programs. Many of his gifts have been given in honor and memory of his friends and fellow geologists.

In 2008, Gipson established the William E. Gipson Named Grant, as part of the Foundations Grants-in-Aid program. This grant establishes a lasting tribute to Gipson's character and will provide annual grants to graduate students for years to come.

DONALD A. O'NESKY
Chairman's Award

The Chairman's Award is given to recognize persons who have made extraordinary contributions (monetary or service) to the AAPG Foundation, while calling attention to the role and value of the Foundation. The 2016 recipient is Donald A. O'Nesky.

O'Nesky has certainly met the qualifications for this award not only through his service, but through his monetary donations as well. O'Nesky joined the AAPG staff in 1978 after retiring from the U.S. Air Force as a lieutenant colonel. In 1985, he was appointed as deputy executive director of the Association and the Foundation and in 1997 was appointed executive director of the Foundation where he served until 1999. During this time, O'Nesky saw the Foundation through the process of becoming an Oklahoma non-profit corporation and the establishment of the Members of Corporation.

O'Nesky joined the Trustee Associates, the major donor group of the AAPG Foundation, taking an active role in the organization by regularly attending the meetings and serving as vice-chair in 2009 and chairman in 2012. O'Nesky continues to serve the Foundation as a member of the Corporation and member of the Fundraising Advisory Committee.

While O'Nesky never had a formal course in geology, the opinion of his friends and colleges is that he has earned "a degree by association" and in 2002, they established the

"Donald A. and Mary O'Nesky Named Grant, as part of the Foundation Grants-in-Aid Program. This fund annually provides grants to graduate students whose thesis research has application to the search for and development of petroleum and energy-mineral resources, and/or to related environmental geology issues for their research projects.

Throughout the year's anyone who has stopped by the Foundation booth at the AAPG Annual Convention and Exhibition has likely spoken with O'Nesky, who is ever present and enjoys sharing the benefits of supporting the geosciences through the Foundation programs.

When the Foundation established its newest program, the Military Veterans Scholarship Program, it turned to O'Nesky, a graduate of the Air Forces Prestigious Air Command and Staff College and the Industrial College of the Armed Forces, and 2000 inductee into "Who's Who in the Military in Oklahoma" to assist with the development of the program. O'Nesky's background provided him with the beneficial knowledge and leadership skills required to make the program a reality. He now serves as the chairman of the Military Veterans Scholarship Committee, which oversees the selection of the scholarship recipients on an annual basis.

KAREN WATERBURY
Teacher of the Year Award

Karen Waterbury, a science teacher at St. Mary's Catholic School in Mount Carmel, Illinois, has been named the 2016 AAPG Foundation's Teacher of the Year.

The Teacher of the Year award, funded and presented annually by the AAPG Foundation, is intended to honor and encourage excellence in geoscience education. Waterbury, who has taught fourth and fifth grade science for more than 39 years, was unanimously chosen as the top teacher by a panel of national judges.

Her award includes a $6,000 prize, half of which will be given to Waterbury for her personal use and the other half to St. Mary's School for educational use under Waterbury's supervision.

"Karen excels in her knowledge of technology and encourages her students to reach beyond their comfort zones," said Alice Wirth, St. Mary's principal. "Her dedication to the teaching profession is superior, and her love for the students and dedication to her position is clearly evident in all that she does."

"In my classroom, students use critical thinking, observation, questioning and modeling before, during and after experiments," Waterbury said of her approach to education. "These strategies are vital in preparing the students for lifelong learning."

INSTRUCTIONS TO BULLETIN AUTHORS

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The AAPG Bulletin is designed for the dissemination of information on the geology and associated technology of petroleum, natural gas, and other energy mineral resources.

MANUSCRIPT SUBMITTAL

First Submission: Format your manuscript using double-spaced lines and 12-point type, and organized as described under **Manuscript Preparation**. Manuscripts may be submitted online (recommended) or print or both, as listed below. Be sure figures and tables are numbered. If possible submit manuscripts with lines numbered.

Online: Submit your entire manuscript through the Rapid Review tracking system (www.rapidreview.com).

Print: Print and/or copy your manuscript on only one side of each sheet. Send one copy of the printed manuscript (text, figures, and tables) and the computer files on CD to AAPG Bulletin Editor, MS Submission, AAPG, 1444 S. Boulder Ave., Tulsa, Oklahoma 74119–3604. Headquarters staff will enter your contact information into Rapid Review and upload your files.

Online and Print: Complete the online submittal forms through Rapid Review (www.rapidreview.com), but mail your manuscript using the Print submittal instructions.

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The AAPG Editor makes the final decision concerning the acceptance or rejection of a paper. Manuscripts are reviewed by two or more referees for technical merit, quality of scientific content, and utility of the results for practicing geologists.

SUBMISSION TYPES

Articles are papers of major extent and contain detailed geologic data that support original interpretations or methods. Submitted article length should not exceed manuscript or PDF 50 pages, including double-spaced text, figures, and tables.

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Memorials are not to exceed 800 words. Longer text is subject to approval by the AAPG Editor. Email asharrer@aapg.org or phone (918) 560–2671 for more information.

MANUSCRIPT PREPARATION

Sections: Organize manuscripts as follows: • Title • Author(s) and address(es) • Acknowledgments • Abstract • Text • Appendix(es) • References Cited • Figure captions (separate sheet) • Figures and Tables (separate from text)

Manuscript Parameters

- Use metric units of measure with the English unit equivalent in parentheses or, conversely, English units with metric equivalents in parentheses. Laboratory measurements do not require conversions.
- Do not use abbreviations except for units of measure.
- Limit the use of acronyms. Please define all acronyms and nonstandard abbreviations used within figures and tables in each figure caption and table footnote.
- Cite figures in numerical order.
- Cite all references and include complete information for each citation in References Cited section.
- Limit the length of the abstract to no more than 250 words.
- Follow the North American Stratigraphic Code (see the AAPG Bulletin, v. 89, no. 11, p. 1547–1591, or online at http://ngmdb.usgs.gov/Info/NACSN/Code2/code2.html).

References Format

- Order references alphabetically. Order multiple listings by the same author(s) by date (earliest first).
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Figures must include scales. Axes must be labeled on graphs.

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Only countries that are recognized by the United Nations (see www.un.org/Overview/unmember.html) may appear on maps published in the Bulletin. Each map should contain a scale bar, north arrow, and a sufficient number (minimum of one set at or near each extremity) of coordinate (latitude, longitude) points to position, orient, and scale it, unless its sole purpose is to locate in general terms a larger scale map.

Each cross section and seismic line, as proprietary considerations allow, should be located on a map with the above basic information. If known, projection and geodetic datum information should be included. Satellite imagery, orthophotos, and similar metric photography should also be treated as maps. Authors are encouraged to submit, as supplementary documents, their maps originally prepared using the Geographic Information System (GIS) in a widely used geocoded file format (e.g., Arc Info, GEOTIFF).

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