

2014



GSA Medals & Awards

Presented at the

Annual Meeting

of the

Geological Society of America



19 October 2014

Vancouver, British Columbia, Canada

2014 MEDALS & AWARDS

PENROSE MEDAL

Presented to
Susan Werner Kieffer



Susan Werner Kieffer
University of Illinois at Urbana-Champaign

Citation by Stephen Marshak

When Sue Kieffer was growing up in a small town in northwesternmost Pennsylvania, she would take forever to walk home from school, for she couldn't help wondering about all that she saw on her path home. That wonder about the world around her—and later, about other worlds—has stayed with her during an amazing professional career that has so far spanned 45 years, and is still going strong.

After receiving her undergraduate degree in physics from Allegheny College, Sue jumped across the continent to study geology and planetary sciences at Caltech, where she received her Ph.D. in 1971. Like many scientists coming of age during the 1960s, she had wanted to voyage into space. Though that didn't happen, Sue's interest in objects in and from space has been a continuing theme in her career. Her graduate work addressed the dynamics of impact at Meteor Crater. Initially, she approached the challenge from a modeling perspective, but when one of her mentors, Gene Shoemaker, showed her a thin section of shocked sandstone, Sue had a light-bulb moment, realizing the importance of seeing geologic features and phenomena first-hand, as part of any geologic study. This principal that has guided her work ever since. Her work on shock metamorphism led Sue into the physics of shock waves. She determined, that in order to understand them, she needed to know the heat capacity for stishovite, but found that such information didn't exist. This challenge might have stopped most geologists,

but not Sue. She taught herself relevant aspects of physical chemistry, and generated a classic and widely used series of papers on the thermodynamics and lattice vibrations of minerals.

From Caltech, Sue moved to a faculty position at UCLA, and from there she went to the U.S. Geological Survey in Flagstaff, Arizona. A year later, Mount Saint Helen's began to erupt, and Sue was soon camping on a ridge overlooking the volcano. Subsequent to the explosion, she mapped tree blow-down patterns, and saw in the patterns, a clue to how the lateral blast of the explosion worked. Once again, Sue realized that, to understand geology, she needed to learn yet another new discipline—rocket-nozzle dynamics. In effect, to understand a geologic map, Sue literally became a "rocket scientist." Over the years, she's applied this understanding to address several topics pertaining to volcanic eruptions and geysers, on Earth and on the moons of Jupiter and Saturn.

While at the USGS, Sue also turned her attention to two of America's greatest wonders. Her interest in eruptions, and on supersonic flow in bubbly water, led her to Old Faithful Geyser. Once again, wanting observation to guide theory, Sue and her colleagues took a field trip down the throat of Old Faithful, via a video camera. The unique footage is likely the only imagery that will ever be obtained of what the inside of this celebrity geyser looks like. From the steam of Old Faithful, Sue plunged into the icy froth of the giant rapids in the Grand Canyon. The first time Sue saw the rapids, she asked the question, "What caused the waves?" Up until then, the standard answer was simply that they were due to flow over debris. But Sue, being Sue, sought a more rigorous explanation. In order to let observation guide theory, she mapped the rapids, taught herself geological fluid dynamics, and developed a theory showing how constrictions cause hydraulic jumps that produce the waves.

From the USGS, Sue moved back into academia, by taking a position as a Regents Professor of Geology at Arizona State University. From ASU, she headed to British Columbia, and then Toronto, where she tried her hand in the private sector, as a consultant specializing in the analysis non-linear phenomena. The University of Illinois at Urbana-Champaign was able to lure Sue to the Midwest, where she held the position of Walgreen Chair of Geology, along with a joint appointment in the Department of Physics, until her retirement last year. At Illinois, Sue expanded her work on extraterrestrial

eruptions, tackling the mysterious plumes of Enceladus, and most recently, has added the study of landslides to her immense palette of interests. She was an inspiring colleague and a wonderful friend, and Shadow, Sue's beloved border collie, immediately became the department mascot.

The Penrose Medal focuses on accomplishments from "eminent research in pure geology." Sue has clearly made a great many profound contributions that qualify. She takes foundational concepts—such as how atoms vibrate in a mineral lattice, how supersonic gases blast from a rocket nozzle, or how water flows in a flume—and makes them geological. But the research side of Sue is only part of her story. She is an accomplished author who delights in making science accessible to non-scientists, as exemplified by her recent book on *The Dynamics of Disaster*. She is also a superb musician, and a former champion marathon runner. And, she is also citizen of the world who, especially in recent years, has invested considerable time and energy on broader issues of societal significance, such as sustainability and geoethics.

Sue has led an amazing journey through the breadth of geology, a journey that has yielded insight into a diversity of subjects. Her multiple contributions have been recognized by numerous honors. She is a member of the National Academy of Sciences and of the American Philosophical Society, and she received both a MacArthur "genius award," and GSA's Day Medal. It is most fitting that Sue's unique role in advancing our understanding of geology—from the microscopic to the megascopic scales—has led to her receipt today of 2014 Penrose Medal. Please join me in congratulating Susan Kieffer on this wonderful award.

Response by Susan Werner Kieffer

Thank you very much, Steve,

I was truly thrilled to receive notice of the Penrose award, perhaps even more than thrilled: the Icelandic word 'berserker' might have briefly applied! Many Penrose Medalists before me have expressed my feelings of both pleasure and unease at having their work recognized in this way in light of many worthy peers. But, as George Thompson said in 2008 "After brief consideration, I decided to accept!"

I would like to acknowledge the "usual suspects"—people in my career who have been in the right place at the right times. As an undergrad in physics and

2014 MEDALS & AWARDS

math at Allegheny College in northwestern Pennsylvania, I had two fantastic women physics professors who inspired me greatly, Georgie Scovil and Barbara Lotze. At Caltech, I had the good fortune of doing my thesis with Gene Shoemaker—in fact, only after graduated did I rediscover in my scrapbooks that in 9th grade, I'd cut out a newspaper article about Gene and his dream of going to the moon, a dream that became mine. Fortunately, along the way in the geology-based Caltech planetary program, I learned that I really wanted to be stuck on earth so I could become a geologist!

From Caltech, I went to UCLA where I had the pleasure of being immersed in an extraordinary group of researchers—John Christie with his then state-of-the-art early transmission electron microscope, Gerhard Oertel, John Rosenfeld, Ron Shreve, and Gary Ernst. I will never forget a GSA meeting where I was giving a paper on mineral thermodynamics at the beginning of my

tenure year. The room was packed when all five of those senior professors walked in to evaluate my talk, perhaps trying not to be noticed, but it was hard to miss them standing in a row in the back of the room! Thanks again to that UCLA group for nurturing me through the transition from grad student to academic.

From UCLA, it was on to the USGS where I had incredible Branch Chiefs—Dave Stewart, Phil Bethke, and Patrick Muffler. They not only supported my work, but, like the UCLA faculty, listened to what I said. It was also there that I began my career-long association with E-an Zen, who challenged and inspired me at every step along the way in things both scientific and moral. E-an, the social conscience of GSA, is now gone, but hopefully his memory will linger on in a GSA memorial effort that you will all be hearing about.

Very early in my professional life, I had a resolve to work in government, academia

and private sector. After a long decade of demonstrating that I have absolutely no survival skills in the private sector, I was saved by Steve Marshak, Jim Kirkpatrick, the Charles R. Walgreen, Jr., foundation, and the geology department at the University of Illinois. Many thanks to you, Steve, my research colleagues Xinli Lu and Pinaki Chakraborty, my mathematician colleague, Gustavo Gioia, my aeronautics colleague, Joanna Austin, and my friends in the geology department, for a wonderful decade of collegiality, and an equally wonderful time as a continuing emeritus professor.

And finally, many, many thanks to GSA, to the Penrose Selection Committee, and to my colleagues and the members of the Society for the interactions over these decades. Our collective work in the geosciences has made, and must continue to make, a difference in how humans interact with our planet.

View images along with the full text from
Susan Werner Kieffer's Gold Medal Lecture at
<http://www.geosociety.org/awards/14speeches/GML-Penrose.pdf>

2014 MEDALS & AWARDS

ARTHUR L. DAY MEDAL

Presented to
Lisa Tauxe



Lisa Tauxe
Scripps Institution of Oceanography –
UC San Diego

Citation by Dennis V. Kent

Lisa Tauxe is a preeminent researcher and educator in the field of Earth magnetism. Her research has focused on the behavior of Earth's magnetic field and its changing intensity and dispersion through time and space. She was the leader of the Time Averaged Field Initiative (TAFI), a multi-institutional collaborative project to obtain a precise and accurate description of the geomagnetic field from volcanic rocks, its most reliable recorders. Better knowledge of properties of the ancient geomagnetic field has already been incorporated in a new statistical model she developed as the lead proponent for correcting inclination error in sediments, which will lead to more precise reconstructions of paleogeography and paleoclimates. This represents a major advance and will change the way we interpret paleomagnetic data. Lisa's first paper as a graduate student was a sole-authored Nature paper that dealt with a revision of the age of Miocene hominoids in Asia based on revised magnetostratigraphic correlations in the Siwaliks, on which she has written numerous additional papers. Also as a graduate student she went out on DSDP Leg 73 and produced a superb magnetostratigraphy for virtually the entire Cenozoic that confirmed in detail the sequence obtained at Gubbio and led to the development of integrated magnetobiostratigraphic time scales, toward

which she continues to make important contributions.

But judging by her citation record (h-index=45 according to the Web of Science), Lisa has clearly become very widely acclaimed for her work on paleointensity, a property of the geomagnetic field that is difficult to measure but critical to our understanding of its generation and long-term evolution of Earth's dynamo. She followed two research avenues – relative paleointensity in sediments, where she was able to significantly improve data reliability by developing the rigorous pseudo-Thellier technique, and the pioneering use of submarine basaltic glasses that turn out to be an ideal material for classical Thellier methods. Some important outcomes of this work are that the mean long-term value for Earth's field intensity may only be about one-half of what had been assumed and intriguingly, that there may be a dependency of the mean field intensity on polarity interval length. She is clearly the world's foremost expert on the rigorous use of quantitative methods to determine paleointensity.

Lisa has established a world-class magnetics research facility at UCSD-Scripps, where she is now a Distinguished Professor and has nurtured a dozen PhD students and mentored a steady stream of post-doctoral scholars over the past 30 years during which she has also maintained her part of a two-career household that included two sons. Lisa is a Fellow of the American Association for the Advancement of Science, the American Geophysical Union, and the Geological Society of America, as well as recipient earlier this year of the Benjamin Franklin Medal of the Franklin Institute. Please join me in congratulating her as this year's Arthur L. Day Medalist.

Response by Lisa Tauxe

I recently became the first woman department chair at Scripps and have noticed that women tend to leave without a Ph.D. at a higher rate than men. I've been trying to figure out why and so I naturally have reflected on my own journey - especially at the moments when someone or something answered the question, 'should I stay or should I go?'

Two people in particular were absolutely pivotal, Neil Opdyke and Dennis Kent. As a second child with a brainy older brother, I have always chosen the 'class clown' style rather than the 'know-it-all' style, but Neil saw through my clown act somehow. I think he was the first to recognize that I had some talent although I've always been convinced that he over-estimated my capabilities. He forgave my many mistakes and talked me out of quitting more than once. Dennis took my meager efforts at science and helped turn them into interesting and provocative papers. Dennis doesn't tolerate anything less than the very best and sent me many times back to the drawing board. He taught me scholarship and a love of scientific argument.

I have also been blessed with a supportive and tolerant family. My parents made it clear that girls could achieve whatever they were willing to work for. I was really lucky to have met my best friend and husband of 31 years, Hubert Staudigel; we raised two wonderful boys who cheerfully participated in field expeditions. We took the phrase "Drill baby drill" literally.

I have had many inspiring colleagues, students and post-docs at Scripps. Cathy Constable and Jeff Gee, in particular have taught me much. I am profoundly grateful for their friendship, help and support over the years.

So I stand here today profoundly grateful for the chance I was given. Paleomagnetists occupy an odd corner of Earth science nestled between geology and geophysics. We are viewed at times with suspicion or amusement. But it is fun and I never would have made it in stand up comedy anyway. For better or worse, I chose this business and I am doing my best to help other women make the choices that are right for them. If science is your talent, then 'you go girl'.

2014 MEDALS & AWARDS

YOUNG SCIENTIST AWARD (DONATH MEDAL)

Presented to
Francis A. Macdonald



Francis A. Macdonald
Harvard University

Citation by Galen Halverson

Francis Macdonald, this year's Donath Medalist, is a field geologist. Fieldwork is his passion, and the Neoproterozoic Era is his muse. His proclivity and appetite for mapping structurally complex terrains, logging unforgiving sections, and traversing hours on end over mountains and across valleys, through rain, sleet, fog, and bear-infested buck brush is vast. In the eleven short years since Francis began his PhD with Paul Hoffman, he has carried out intensive fieldwork in Alaska, Yukon, Namibia, Mongolia, and Death Valley, amongst other exotic and challenging locations. In each case, he has corrected previous mapping blunders and erected a much improved stratigraphic framework. And in every case, the revised mapping and stratigraphy have motivated new tectonic models and other key revelations. And so the exceptionally preserved Precambrian-Cambrian boundary interval in the Dzabkhan terrane in Mongolia was deposited in a foreland basin as it collided with an arc; the North Slope subterranean of northeastern Alaska was pinched from northeastern Canada; the oldest biomineralized fossils in the geological record are now positioned correctly at about 800 Ma; the Sturtian glaciation began 717 Ma and overlaps the emplacement of the Franklin Large Igneous Province; and the Neoproterozoic stratigraphy in Death

Valley—well, it just makes sense now. And the list goes on.

In addition to sorting out the stratigraphy and the tectonics, Francis and his geochronology colleagues have added a torrent of timely U-Pb and Re-Os radiometric ages. In the past four years, they have led the charge in calibrating the Cryogenian Period and solved the nagging conundrum of the duration and synchronicity of the Sturtian glaciation: one and long-lived. Many more critical new ages are in the pipeline.

Francis is the hub in a whirlwind of interesting and cutting edge research. His pioneering and comfort-defying fieldwork has paved the way for a troupe of geochemists, paleontologists, sedimentologists and others—both like-minded and not—to extract ever more information from the rocks he has tamed. But he is not content simply to lead colleagues into the field or shuttle rocks to other labs—although he does this with gusto. Often as not, Francis rolls up his sleeves and pounds away at the interpretations of novel geochemical and paleontological data sets, drawing on his relentless curiosity and impressive command of a diverse literature. In this regard, he is reminiscent of his PhD supervisor, whose legendary feats in the field are mirrored by his intellect in the office and the conference hall.

When one ponders the extraordinary collection of amazing stratigraphic sections, well-placed geochronological samples, and exquisitely preserved carbonate samples Francis has amassed, one cannot help but think that he is unusually lucky. But this luck has been hard earned through weeks, months, and years in the field and an insatiable drive to understand the ancient Earth and share this knowledge with others.

Response by Francis A. Macdonald

Thanks Pippa—it has been a blast to work with you in the Yukon. I have cherished talking rocks with you, not only on the outcrop, but also in the cook tent when we get throttled by storms, and throughout the year when we are crushed by classes.

First off, I thank GSA, my letter writers, and the Donath family for this honor. There is no society I could be more proud to be associated with, let alone receive an award from.

Any successes I've had in Geology have been due in large part to great mentors, collaborators and students. Because all of my work is collaborative, bringing together geology, geochemistry, and paleontology, I

have many people whom I'm indebted to, and although I cannot thank them all there is a few that I should embarrass by association. My geochronology work has been dependent on the wizardry of Jim Crowley, Mark Schmitz, and Alan Rooney. My paleontological studies could not have been possible without the eagle eyes of Sara Pruss, Tanja Bosak, and Phoebe Cohen. My geochemical thinking has been enlightened with the brilliance and generosity of Dan Schrag and David Johnston.

As an undergrad, Joe Kirschvink and Jason Saleeby gave me confidence and inspiration to pursue Geology. Joe along with Carolyn Shoemaker helped me get my geological career started mapping impact craters in Australia on a Watson Fellowship, and I wear a bolo tie of Gene's today with pride. My PhD advisor, Paul Hoffman, gave me the freedom to explore and fail, and continues to challenge me about every detail (including the orientation that I put staples into papers and the luster of the coin I use for scale in photos), but he has also supported me at every turn.

When I started my thesis in Alaska I was fortunate to cross paths with Bill McClelland (at a Cordillera GSA meeting), who set me straight and disavowed me of some bad ideas, and since then I have been pushed further than I could have imagined by my student Justin Strauss.

I first went to Mongolia with my good friend Davey Jones and was lucky to have Uyanga Bold as a field assistant. Uyanga then became a student with me and along with her mother has made our work possible. Our Mongolia work has bloomed with the hard work and mapping by both Uyanga and Emmy Smith.

I thank Tony Prave for introducing me to the geology of Death Valley. He managed to look past my associations with Harvard and recommend regions for teaching field camp. Since then, Tony has become a mentor and a friend.

Recently, two years ago at the GSA meeting in Charlotte, I randomly met Paul Karabinos through a friend and we began chatting about the Taconic orogeny. This again led to a new and fruitful research direction. Indeed, I am indebted to the GSA not only for this award but also for facilitating some of my best collaborations.

Lastly, and most appropriate to a GSA in the Canadian Cordillera, I thank Charlie Roots from the GSC. My first contact in the Yukon was Charlie Roots from the GSC. Charlie brought me into his family, took me

2014 MEDALS & AWARDS

to his thesis area, and has supported all of my work and that of my students. Charlie is a great gentleman and has made long-lasting contributions to the understanding of Yukon geology.

I also thank my wife, Kelsey, for putting up with my long field seasons and infrequent showering.

Thank you Charlie, thank you Donath family, and thank you GSA!

View images and full text from
Francis A. Macdonald's Gold Medal Lecture at
<http://www.geosociety.org/awards/14speeches/GML-Donath.pdf>

2014 MEDALS & AWARDS

BROMERY AWARD FOR MINORITIES

Presented to
Isaac J. Crumbly



Isaac J. Crumbly
Ft. Valley State University

Citation by Lisa White

I am delighted to honor Dr. Isaac J. Crumbly with the 2014 Bromery Award. Dr. Crumbly is Associate Vice President for Career and Collaborative Programs and Director and founder of the Cooperative Developmental Energy Program (CDEP) at Ft. Valley State University (FVSU), a HBCU (Historically Black College and University) in Georgia. A cornerstone of CDEP are the dual-degree programs in geology, geophysics, and petroleum engineering with Georgia Tech, Penn State University, the University of Texas at Austin, the University of Texas Pan American, and the University of Arkansas. Dr. Crumbly works tirelessly to recruit and mentor minority students in the program that has graduated 81 engineers, 31 geoscientists, and 8 health physicists.

Setting high standards and expectations for CDEP students, graduates of the program are very visible professionals with energy companies, government agencies, and in academia. FVSU students participating in CDEP have completed more than 850 internships in the energy industry and gained over 320,000 hours of hands-on-work experience. Since 1992, CDEP has awarded over \$8 million in scholarships to academically talented minority students to pursue degrees in biology, chemistry, engineering, geology, geophysics, health physics, and mathematics.

Aware of the importance of building a pipeline to college and to STEM majors, Dr. Crumbly has also nurtured a summer enrichment feeder program for high school students at FVSU called Mathematics Science & Engineering Academy (M-SEA). His foresight, determination, and skill in designing and nurturing a nationally-recognized program have significantly impacted the number of African Americans entering the geosciences workforce.

Dr. Crumbly's degrees in horticulture and botany would appear to be a far cry from the geosciences, however, research he conducted on greenhouse utilization of waste energy in the 1970s led to additional research and training opportunities with the Environmental Protection Agency and the U.S. Department of Energy. Responding to a call for proposals from the Department of Energy in 1983 to address the underrepresentation of women and minorities in energy fields, Dr. Crumbly first received support for CDEP 31 years ago.

Dr. Crumbly's remarkable career and his achievements have earned him recognition from the White House, the State of Georgia, numerous universities in the form of honorary degrees, and prestigious awards from professional societies. In February of 2013, he received a Resolution from the Georgia House of Representatives In Recognition of Celebrating 30 Years of Success for Developing and Sustaining the Cooperative Developmental Energy Program. It is fitting that we honor Dr. Crumbly with the Geological Society of America Bromery Award and recognize his vision, determination, and skill in designing and nurturing a program and significantly impacting the number of African Americans entering geoscience fields.

Response by Isaac J. Crumbly

I thank you Dr. White for your kind introduction and for honoring me with your nomination for the Bromery Award. Indeed, I am very proud to be a recipient of the award and am humbled by it and appreciate GSA's generosity.

This is an unexpected honor. I am probably the first non-geoscientist selected for this award. For that reason, I owe the audience an explanation. For 40+ years, I have dedicated my life to educating and mentoring students. And for the past 22 years, I have been focused on working specifically with students interested in STEM disciplines related to the energy industry. It is my involvement with these students and

the unique program created for them that has led to my being bestowed with this esteemed honor today. I am receiving this award because of the role that the Fort Valley State University (FVSU) Cooperative Developmental Energy Program (CDEP) has played in recruiting minorities into the geosciences. FVSU is a minority serving institution and is one of the nation's 105 Historically Black Colleges and Universities (HBCU); CDEP is a program that was established in 1983 with funds from the U.S. Department of Energy. The program's primary objective is to increase the number of minorities and women pursuing careers in the energy industry. As CDEP's founder and director, it was my responsibility to design a model that would best accomplish the program's objectives.

CDEP developed in two phases. Phase I consisted of establishing a Minority Student Summer Energy Internship Program (MSSEIP) for academically talented FVSU students with energy companies and governmental agencies. After operating successfully for nine years, CDEP incorporated MSSEIP into phase II. Phase II began in 1992 and consisted of establishing dual degrees in disciplines such as engineering, geology, geophysics, and health physics that are important to various sectors of the energy industry. Since FVSU does not offer degrees in the above disciplines, it was necessary to form partnerships with universities that awarded degrees in those disciplines. The dual degree programs with partnering universities work in the following manner: During the first three years, CDEP recruits students to major in biology, chemistry, or math at FVSU. Students then transfer to partnering universities for years four and five to earn degrees in engineering, geology, geophysics, and health physics. Since 1992, CDEP has formed partnerships with Georgia Institute of Technology, Pennsylvania State University, University of Arkansas, University of Oklahoma, University of Nevada at Las Vegas, University of Texas at Austin, and the University of Texas-Pan American. The financial support for the dual degree programs is provided by partnering corporations and governmental agencies. The following represents a few of the major corporations and governmental agencies that have supported CDEP's efforts for recruiting minorities for the geosciences: Aera Energy, BP Corporation, Chesapeake Energy, Chevron Corporation, ConocoPhillips, ExxonMobil, Marathon Oil, Shell Oil Company, & U.S. Geological Survey.

2014 MEDALS & AWARDS

As a result of the aforementioned collaborations, CDEP and its partnering universities have graduated 84 engineers, 32 geologists/geophysicists, and 8 health physicists. The 32 geologists/geophysicists represent a significant percent of African Americans who have obtained degrees in the earth sciences. Also, CDEP operates a pre-college STEM academy that serves as a pipeline for the dual degree programs.

Space and time do not permit me to acknowledge all of the individuals who have contributed to CDEP's success. However, I would be remiss if I did not acknowledge a few individuals who have played major roles in the success of the program. First, I am very appreciative to The Late Dr. Mack Gipson, an early pioneer in recruiting minorities into the geosciences, for supporting my idea to establish dual degree geoscience programs with major universities. Secondly, I give thanks to Dr. James F. Kimple, former Dean of the College of Geosciences at the

University of Oklahoma, who was brave enough to establish dual degree geoscience programs with an HBCU. Thirdly, I extend my sincere appreciation to The Late Joseph Huffstetler, recruiter for Occidental Oil Corporation, who introduced me to representatives of oil and gas companies. Others who have also been instrumental in the success of the program include: The Late Patricia Hall who supported the program and contributed to the professional development of the CDEP alumni; Mr. Reginald Spiller who has supported CDEP's dual degree initiatives from the very beginning in the form of providing support, encouragement, and mentoring to many of CDEP's graduates; Mr. Reginald Beasley for over twenty years of program support and mentoring to CDEP's interns and graduates; and Mr. Darryl Willis and Dr. Frazier Wilson who have supported the program for over a dozen years and also mentored many of CDEP's geoscience graduates. Moreover, I would be remiss if

I did not acknowledge the organizational contributions of the National Association of Black Geoscientists and the support of its members who have nurtured and mentored the CDEP students.

In closing, it is imperative that I thank CDEP's corporate and governmental sponsors for their funding support which provides scholarships and internships for CDEP scholars and the partnering universities for providing the students with second degrees in geology, geophysics, engineering, and health physics. Additionally, I thank Dr. Aditya Kar for mentoring the geoscience students at FVSU prior to their transfer to partnering universities, the CDEP Staff for their commitment to the program's mission, my beautiful wife, Dorothy, for supporting me for 40+ years, and finally Dr. Randolph and Mrs. Cecile Bromery for establishing this award, and GSA for presenting me with this honor.

2014 MEDALS & AWARDS

GSA PRESIDENT'S MEDAL

Presented to
Thomas H. Jordan



Thomas H. Jordan
Southern California Earthquake Center

Citation by Suzanne Kay

"The Geological Society of America established and commissioned the President's Medal to recognize and be conferred upon an individual, groups, or entities whose impact has profoundly enhanced the geosciences profession: through supporting and contributing to the Society; by advancing geosciences, enhancing professional growth, and/or promoting geosciences in service of humankind; and/or by significantly enlarging the range of scientific achievement for the growth of our profession." The selection is made by the president of the Geological Society of America with the approval of the GSA council and is awarded at the fall meeting following the president's term.

It is in this vein that my choice as the immediate past president of the Geological Society of America for the 2014 President's Medal is a GSA fellow, who is an outstanding member of the geosciences community, has made exceptional intellectual contributions to the field of geological sciences and has played a prominent role in promoting geosciences in the service of humanity. I can think of no one more deserving of the GSA President's medal than the noted American seismologist Professor Thomas Hillman Jordan, who is currently University Professor and the William M. Keck Professor of Earth Science at the University of Southern California. He is also importantly the director of the Southern California Earthquake Center, known as

SCEC, which is a leading consortium for earthquake research. SCEC is made up of more than 60 institutions and serves as a spokesman on questions concerning seismicity. Before arriving at USC, Professor Jordan was the head of the Earth, Atmospheric and Planetary Sciences Department at the Massachusetts Institute of Technology. Over his distinguished career, he has studied earthquakes, the seismological study of the earth's structure and geodetic observations of plate motions and interplate deformation. He has had a continuing interest in questions of continental formation and tectonic evolution. During his career to date, he has been an author on more than 200 scientific publications, including two popular textbooks (with J. Grotzinger) *Understanding Earth*, 6th ed. and *The Essential Earth*, 2nd ed, Jordan is among the most cited authors in Earth Science on Google scholar with almost 17000 citations.

His distinctions are too numerous to list. As examples in his career, he has been awarded the James B. Macalwane medal for outstanding young scientists from the American Geophysical Union, the George P. Woollard Award of the seismological section of the Geological Society of America, fellowship in a number of societies including the American Geophysical Union and Geological Society of America, membership in both the American Academy of Arts and Sciences and the National Academy of Sciences, a National Associate Award by the National Academy of Sciences, membership in the American Philosophical Society, and the American Geophysical Union Inge Lehmann Medal for outstanding contributions to the understanding of the structure, composition, and dynamics of the Earth's mantle and core." On the service side, he received the American Geological Institute award for Outstanding Contribution to Public Understanding of the Geosciences in 2012.

As a few examples of his public outreach, he wrote an opinion piece in the *New Scientist* entitled "Don't blame Italian seismologists for quake deaths" during the time of the intense debate on the role of scientists and the government in earthquake predictions in the aftermath of the tragic 2009 earthquake in L'Aquila, Italy. He also appeared on National Public Radio's "All things considered" to discuss the issues of science, disaster forecasting and the public. He has more recently weighed in on human causes of earthquakes in Oklahoma and in a message to those in California with the statement "We're going to get hammered and

I think people are going to be amazed at what an earthquake is going to do." He is a go-to guy on questions on earthquakes and their prediction and interpreting their meaning to the community. Please come and hear his lecture this afternoon entitled "Prediction Problems of Earthquake Systems Science" Unlike many previous winners of the GSA President's Medal, this will not be his first talk at GSA and we hope it will be one of many to come.

I am delighted to present the 2014 President's Medal of the Geological Society of America to Professor Thomas Hillman Jordan.

Response by Tom Jordan

Suzanne, thank you very much for this award and your generous citation. I know you have great latitude in who you select to receive the GSA President's Medal, and I am very honored that you have chosen me to join a group of past medalists that comprises distinguished writers, software developers, educators, and philanthropists, as well as a noted artist and an eminent jurist.

This is a very special award for me personally, because it comes from the leadership of a society I greatly admire. I have always thought of myself as a scientist who uses the tools of physics to do geology, and I'm always happy when I'm in the field with real geologists who have their boots on and hammers in hand.

And you know that's one thing about science—most of it is done by happy people who have a sense of wonder and enjoy the privilege of exploring the world around them. In this regard I'd like to thank the people who have made me happy: my family, especially my wife Margaret, who is here with me today, and my children, as well as my many friends, teachers, and colleagues who, for the most part, are also happy explorers.

Indeed, my scientific accomplishments have primarily resulted from my collaborations with scientific colleagues and students. This has been especially true during the most recent phase of my career as director of the Southern California Earthquake Center, and I take this award to be a tribute to what is, by all measures, a very special collaboration.

SCEC's mission is earthquake system science. We can't predict earthquakes, which means we don't really understand them. And, as I constantly remind students new to the field, we can be confident that great discoveries lie ahead. In earthquake system science, we try to build our predictive understanding brick-by-brick, drawing

2014 MEDALS & AWARDS

from the knowledge of many disciplines—seismology, earthquake geology, tectonic geodesy, and computational science. In particular, SCEC has taught me the importance of deep collaborations, which, like deep friendships, are special because they are based on personal and trustful interactions sustained over many years, repeatedly successful and mutually rewarding.

So let us here celebrate the joy of science well done, and not yet done, and let us reflect on the happiness it brings to all of us who have the pleasure of working to gain new knowledge about this very interesting and dynamic planet. And thank you again, Suzanne, for an honor that I can share with many others.

View images and full text from
Thomas H. Jordan's Gold Medal Lecture at
<http://www.geosociety.org/awards/14speeches/GML-PresMedal.pdf>

2014 MEDALS & AWARDS

GSA PUBLIC SERVICE AWARD

Presented to
Mark C. Quigley



Mark C. Quigley
University of Canterbury

Citation by Jarg Pettinga

It is a tremendous privilege for me to introduce Associate Professor Mark Quigley from the University of Canterbury in Christchurch, New Zealand, as the recipient of the 2014 GSA Public Service Award.

In the early hours of 4th September 2010, the Magnitude 7.1 Darfield Earthquake west of Christchurch city in the South Island of New Zealand placed Mark Quigley in a hugely challenging yet also opportunistic situation. He and his partner Candice were immediately impacted by the severe ground shaking causing significant damaging liquefaction at their home located in the eastern suburbs of the city, something repeated five times in the subsequent months as the Canterbury Earthquake Sequence continued. Yet in those first hours Mark took up the challenge, and focused on both investigating what had happened as well as providing almost immediate communication from a geoscience perspective for the local community as well as national and international audiences.

As the sequence unfolded seismic activity migrated to directly beneath and then progressively east of Christchurch city, with the many thousands of felt aftershocks occurring over a period of more than two years. This was punctuated by a number of large damaging earthquakes, including the disastrous 22 February 2011 quake. Through these difficult times, Mark made

many appearances on National TV and in the international media, providing essential commentary on what had happened and what to expect. His effective engaging style, combined with a rare ability to communicate complex scientific issues to the general audience in a credible and calming way are extraordinary skills to draw on in the immediate turmoil, fear and uncertainty following such major natural disasters. Mark quickly became the person that media organizations turned to for his pragmatic commentary and reliable information. For many months he maintained a very high work rate not only in terms of the hundreds of media commitments (TV/radio/print/internet), but also through leadership of the field research response and rapid collaborative publication of more than 20 international peer-reviewed journal articles – including several key contributions to GSA Today, GEOLOGY and GSA Bulletin. Mark wrote frequently for national newspapers, and has continued to do so, highlighting his commitment to contributing as much science as possible towards Christchurch's recovery and rebuild. When taken in aggregate, these achievements represent a truly exceptional "benchmark" effort.

Just a few brief sentences really do not reflect the enormous contribution that we are recognizing here. For example, Mark has given more than 80 public and invited keynote lectures, including one to a capacity audience of over 1000 in the Christchurch Town Hall in October 2010 and a week earlier to a capacity audience of over 700 at the university, with more than 600 having to be turned away! Mark's inspirational leadership qualities are also evident through the numerous invitations for keynote presentations to scientific, corporate and government organizations. In addition he has been involved in an advisory capacity with the Canterbury Earthquake Recovery Authority (CERA) and other local, regional and central government agencies, so ensuring that the future rebuild of Christchurch city maintains an essential focus on the geological factors that have devastated and are continuing to impact New Zealand's second largest city.

Over the last four years we have seen the emergence of Mark Quigley as not only one of our leading earth scientists, but also a leading science communicator – providing understanding, context and vision. His effective communication style, combined with a deep subject knowledge have been pivotal to providing the general public as well as local, regional and national leaders

with understanding and an awareness of the key relevance of geosciences information to explain what is happening and how this is crucial to guiding decision making with respect to the ongoing recovery and future rebuild of Christchurch city. Mark also maintains a personal website www.drquigs.com which is focused on science communication, which over the last four years has amassed over 3 million hits, and more than 50,000 unique visitors to the site.

Recognition of his outstanding contribution has come by way of the prestigious New Zealand Prime Ministers Prize for Science Communication in 2011, complemented by the award of the NZ Association of Scientists Science Communication Prize and the top Hochstetter Lecturer award by the Geoscience Society of NZ in 2012.

I'd like to include two quotes here. Firstly, one by New Zealand Prime Minister the Rt. Hon. John Key "[Mark] did an enormous amount of research in terms of Christchurch. He was communicating with people at a time when it was important that they understood what was happening in terms of the seismic activity"; and the second by Peter Griffen, Director of NZ Science Media Center, wrote, "[Mark is] one of our best science communicators. He is a scientist who understands the need for effective science communication and is willing to step up and engage with the media in the name of improving the public's understanding of science. He is a great asset to natural hazards research in New Zealand and to science communication in general".

In summary, Mark Quigley is an intuitive, natural leader and over the last four years he has become one of New Zealand's best known and respected earth scientists for his research excellence and through his clear, accurate and engaging scientific communications following the September 2010 Darfield (Canterbury) earthquake. It was no exaggeration when various media outlets started referring to Mark as a "geo-rock star"! It is with great pleasure that I introduce Associate Professor Mark Quigley as the 2014 recipient of the GSA Public Service Award.

Response by Mark C. Quigley

Thank you, Jarg. Your words mean a great deal to me because you have spent so much of your career connecting earth science with policy makers, end-users and the general public in your usual thoughtful and thorough

2014 MEDALS & AWARDS

manner. I have benefited immensely from your selfless and thoughtful mentorship, particularly since the 2010 Darfield and 2011 Christchurch earthquakes, when our personal and professional lives were forever diverted in ways we could not have foreseen. I am deeply humbled to share this award with you.

I would like to thank the Geological Society of America for bestowing upon me the privilege of being the first scientist based outside of America to receive this award. Indeed the challenges we face in science communication and integration into society transcend geographic and cultural borders. I needed only to read the names of previous recipients of this award to appreciate the importance of this recognition. Thank you to the GSA awards committee for allowing me the opportunity to coexist with such fine company.

I share this award with colleagues in New Zealand and abroad. Kevin Furlong was a tireless source of enthusiasm, inspiration, and encouragement throughout the Canterbury earthquake sequence. It was mutually fortuitous that a previously unknown fault waited some 25,000 years so that it could rupture on our watch. I am greatly appreciative to my colleagues and postgraduate students in the Department of Geological Sciences at the University of Canterbury for their support, encouragement, and efforts towards producing the best science we could during a difficult time. Amongst many others, I specifically acknowledge Brendan Duffy, Timothy Stahl, Eric Bilderback, Duncan Noble, and Thomas Wilson.

I spent much of the Canterbury earthquake sequence on the steep part of the learning curve and am thankful to have learned from, and collaborated with, some exceptional scientists from GNS Science. I would like to thank Russ Van Dissen, Nicola Litchfield, Pilar Villamor, David Barrell, Richard Jongens, and the late John Beavan in particular.

Much of my research and public communications could not have been conducted without the financial assistance of the New Zealand Earthquake Commission, and I am greatly appreciative of their continuing support of my work. I'd also like to thank the Christchurch Press for providing me with the opportunity to communicate effectively with the general public.

I am delighted to share this award with my family, my friends, and most importantly my partner Candice Egan, whose encouragement, resilience, and love inspired me in immeasurable ways.

Each year, approximately 150 magnitude 6 or greater earthquakes occur on our planet. Some occur in places where they do not inflict damage on our natural and built environments. Others cause numerous fatalities and billions of dollars of damage, forever changing the lives and environments of those affected.

Such events may populate global news for a day or a week, but diminish rapidly within the abyss of the constantly evolving news cycle. Certainly scientists have important roles to play in the immediate aftermath of these events, when rapid data capture and interpretation is essential for informing the emergency response, forecasting the temporal and spatial distribution of future hazards, and increasing our knowledge of earthquakes. However, the importance of science engagement and communication does not mimic Omori's Law of aftershock decay. Science is equally important after the news cameras have gone home and seismicity rates have decreased. This is when decisions pertaining to future land use are commonly made by national governments and local councils. This is when opportunities to use science to reduce societal and financial exposure to future hazards are most abundant. This is when initial trauma accompanying the natural disaster subsides and is commonly replaced by a thirst for knowledge.

It is increasingly clear that society demands more of earth scientists than seismic hazard maps or journal articles. We have learned repeatedly that pacifistic or dismissive approaches to invalid earthquake prediction claims, for example, enable the proliferation of untenable reasoning to a vulnerable public seeking certainty via hungry and fast-moving news media. Scientists must be prepared to engage quickly, transparently, and respectfully to increase public trust in science. The public can handle scientific debate if the underpinning scientific principles are explained and supporting data is publicly available. Public engagement benefits from scientists who are willing to let the public see their personal side, who share their hypotheses openly and honestly, and who explain what we do and don't know (and why we don't know it). Scientists should engage beyond the comfortable peripheries of their immediate research expertise to publicly pressure those in charge and float ideas for safer, more sustainable futures; with our skill sets, earth scientists are ideally placed to act as critics and consciences of society.

The successful acceptance and integration of science into society requires strong efforts in communication with the

general public through all media channels, just as it requires clear transparent messaging to those in charge. The hard reality is that the tasks required to force change in how councils, governments, planners and developers perceive and deal with the challenges of natural hazards are typically laborious, unglamorous, and incremental in impact. This represents a major challenge for young academics seeking tenure and promotion; time spent on writing newspaper articles, council reports and delivering public talks is time removed from writing grants and research publications. Citation metrics fail to capture the impact of non-peer reviewed media contributions, even though these messages often extend well beyond the range of our best research papers in influencing public opinion. Up skilling the media abilities of our scientists, increasing incentives for public engagement, and granting free open access with no media embargoes for all research publications that have direct and timely societal implications are all useful topics for collegial discussion. When it comes to science communication and policy engagement, all scientists are on the same team with the same common goals.

2014 MEDALS & AWARDS

GSA DISTINGUISHED SERVICE AWARD

Presented to
P. Geoffrey Feiss



P. Geoffrey Feiss
GSA Foundation

Citation by Chris Hepburn

It gives me a great deal of pleasure to present to you, P. Geoffrey Feiss, the GSA Distinguished Service Awardee this year. Geoff has had a distinguished career as an economic geologist, professor and college administrator, which included stints as a Department Chair (UNC Chapel Hill), Dean (UNC Chapel Hill and William and Mary) and Provost (William and Mary). He has given freely of his time to our science and often has been sought to be a member or chair of committees for many organizations beyond GSA, such as NAGT, AGI and the Natl. Academy of Sciences/Natl. Research Council. Geoff's broad understanding of our science and wise counsel have also led him to be asked to serve on at least a dozen academic department review committees. Over the years Geoff has served GSA in many capacities, including being on some 12 committees and panels and chairing the SE Section, the Geoscience and Public Policy Committee and the Congressional Science Fellowship Selection Committee. However, I believe, his most important contributions to the Society have been through his work for the GSA Foundation. In 2009 Geoff was a Trustee and Vice-Chair of the Foundation when he retired as Provost from William and Mary and moved to Colorado to enjoy the mountains. Soon after, however, the Foundation Board asked Geoff to put off his retirement and take on the duty of President

of the Foundation. Geoff agreed, and the rest is history. At the Foundation Geoff worked harder than ever, despite the fact that this was supposedly a half-time position. Through his skills and dedication, the Foundation has been revamped, modernized, and brought into a close, collegial working relationship with GSA, thereby strengthening both organizations. Through his efforts fundraising has increased, and this year, for the first time in history, the Foundation will make available to GSA over \$1 million dollars for its programs. Geoff is set to step down as President of the Foundation at the end of the year, perhaps, to finally retire (we'll see?), but he leaves with notable and enduring contributions to both GSA and the GSA Foundation. Changes Geoff initiated will help the Society to accomplish its goals for a long time to come. For this he clearly deserves the recognition afforded by this award, and our heart-felt thanks.

Response by P. Geoffrey Feiss

Thank you, Chris Hepburn, for your citation. This is especially meaningful as Chris was one of the first grad students I met at Harvard in 1965 and served as a role model for me in those years. An equal thanks go to the GSA Council for thinking that I deserve this recognition.

GSA has always been my professional home. I attended my first professional meeting in 1969 when I was able to go to the first Penrose Conference in Tucson organized by, among others, Brian Skinner. My first GSA Annual Meeting was that fall in Atlantic City. In those benighted days of the Smoker - the predecessor of the Welcoming Party, I and probably a dozen fellow graduate students, with an equal number of uninvited cockroaches, poured ourselves into a hotel room last remodeled when Atlantic City was a suburb of the capital of Mauritania. I recall filling the closet, floor to ceiling with sleeping bags, assuming the maids would not notice that the room was a bit overbooked. GSA must have gotten a great rate on the convention center before legalized gambling in New Jersey.

From 1969 to today, the rhythm and cycle of GSA meetings has been as regular as the seasons. I may have missed two or three annual meetings in the past forty-five years. I have attended too many section meetings to count. I gave my first professional talks and posters at GSA meetings, lead my first field trips for GSA, and proudly published in GSA journals. I never had a GSA Research award, but my wife did.

Beyond these abundant opportunities to present my science to others, however, GSA allowed me to meet new collaborators in research, to keep in touch with friends from undergraduate and graduate school, and to maintain professional affiliations with the five or six academic departments that I have called home over the years. Part of this annual rhythm of GSA meetings was always the new ideas, the reinvigoration, and the stimulation of the intellectual smorgasbord that is a GSA meeting.

I also had the pleasure, and pleasure it has been, to serve GSA. Whether as a section officer, technical program chair, committee member, or otherwise, this service to GSA has allowed me to begin to count as friends the remarkable individuals who have and continue to lead GSA - friends I would have otherwise never made had I remained cocooned and cloistered in the narrow confines of my academic subspecialties.

Hence, it means a great deal to me to be recognized for service to GSA. It has been and continues to be a labor of love, a payback for all the personal and intellectual opportunities GSA has provided me, and my way of "paying it forward" to future generations of geoscientists. I can only hope they have as much fun being a student of the Earth as I have had.

I thank Bob Hatcher for inviting me to serve the Foundation Board of Trustees a decade ago, Bob Rutford for his leadership and tough-love mentoring (those who know Bob understand), Margaret Eggers and all the trustees I have worked with for their confidence in me, and Jack Hess for his collegial, wise, and calm leadership.

The Foundation staff are gems. Anna Christensen, Geni Klagstad, Jo Bell, Chris Tallackson, Debbie Marcinkowski, and Ann Crawford have made me look good every day. The professional staff at GSA are, as their status implies, consummate professionals and a pleasure to work with. I should also acknowledge a debt to my father, Julian Feiss, a mining engineer whose active service to the AIME when I was a teenager modeled for me the importance, indeed the necessity, of serving one's professional organization. And, of course, thanks to my fellow geologist and wife, Nancy West, for tolerating yet another set of meetings and frequent out-of-town trips and for never doubting the rewards that come with serving a great learned society like GSA.

2014 MEDALS & AWARDS

SUBARU OUTSTANDING WOMAN IN SCIENCE AWARD

Presented to
Ami L. Riscassi



Ami L. Riscassi
University of Virginia

Response by Ami L. Riscassi

I am delighted to receive the Subaru Outstanding Woman in Science Award and grateful for this opportunity to thank some of the people who have been and continue to be strong influences on me. Each are not only outstanding scientists but also exemplary people who raise the bar high and then take the time to listen and debate and make the challenges in the classroom, the laboratory, and the field truly enjoyable. Working backwards, at Oak Ridge National Lab, my mentor Scott Brooks and the whole Hg research team. At the University of Virginia, my PhD advisor Todd Scanlon as well as George Hornberger, Jim Galloway, Janet Herman and Susie Maben. My USGS mentors in the Everglades, Ray Schaffranek and Eddie Simonds, all my NPS co-workers in Yosemite and Lake Clark National Parks. I will do my best to be an equally positive influence on the next generation of scientists.

Citation by Scott Brooks

It is my privilege and honor to present this year's citation for the Subaru Outstanding Woman in Science Award to my colleague Dr. Ami Riscassi. In the relatively short time since beginning her PhD, Ami has distinguished herself through (i) the significance of her contributions, exemplified through her publications, (ii) the innovative approaches she brings to problem solving, (iii) her impact on the scientific community in tackling complex environmental problems, and (iv) her leadership and outreach to the broader community engaging high school students and young women in pursuing careers in math and science.

Please join me in congratulating Ami on this well-earned recognition.

**This award sponsored by
Subaru of America, Inc.**



2014 MEDALS & AWARDS

2014 AGI MEDAL IN MEMORY OF IAN CAMPBELL

Presented to James F. Davis



James F. Davis
Retired California State Geologist

Citation by John G. Parrish

Dr. James F. Davis has demonstrated an exemplary career as a professional geologist in public service for 50 years.

Dr. Davis commenced his long service career as an Associate Scientist at the New York State Geological Survey in 1963. Five years later, he was appointed State Geologist of New York, a position he held successfully for the next decade (1968 – 1978). While in this position, Jim demonstrated the importance of geology and seismology as critical fields in the siting of nuclear power plants and associated waste disposal facilities.

In 1978, Jim resigned his position in New York to become the 19th California State Geologist, following a tradition that began in 1850 with the first State Geologist, John Boardman Trask. Jim proved to be the longest serving California State Geologist, with 25 years (1978 – 2003) of creative and honorable service. Under Jim's determined leadership, the then California Division of Mines and Geology greatly expanded its scope of programs from the traditional mining and mineral resources, and regional geologic mapping, into the ever widening and complex fields of geological hazards, earthquake engineering and strong motion seismology, and quantitative seismic hazards assessments. During Jim's tenure he oversaw the passage and implementation of the Seismic Hazards Mapping Act (1990), which today has mapped

liquefaction and landslide hazards covering 119 7½ - Minute Quadrangles (7,400 square miles) affecting over 150 communities.

Jim has been a strong advocate for modern seismic monitoring systems as a tool for locating earthquakes and measuring their size, and for acquiring ground motion data for use by structural engineers to make structures more earthquake resilient. In 1971 the California Legislature adopted the Strong Motion Instrumentation Program (SMIP) to monitor the effects of earthquake strong motion on structures. The information gathered by this program directly affects the California Building Code. Under Jim's guidance, the SMIP became the largest strong motion monitoring network in the United States, today with over 1,200 stations and 8,500 instruments in place. In addition, the CGS/SMIP is now an integral part of the California Integrated Seismic Network (CISN), a seismic monitoring network composed of many smaller networks operated by the U. S. Geological Survey, U. C. Berkeley Seismological Lab, Caltech, and others.

Somewhere in Jim's busy schedule, he found time to be the Chair or President of nine geological organizations, including President of the Association of American State Geologists (1985) and President of the American Geosciences Institute (1987). He, also, has been awarded five Lifetime Achievement and Distinguished Service awards.

For 11 years I had the pleasure of working directly with Jim in my capacity as Executive Officer of the California State Mining and Geology Board, which is the policy making body for the California Geological Survey. I developed a deep respect for Jim's scientific acumen, as well as his political awareness and abilities to make things happen.

Today, Jim is anything but retired, continuing to be immersed in geology and its impacts on society – Jim just termed-out as an elected member of GSA's Geology and Public Policy Committee, where typical to his character, he was busily reframing and making more relevant and understandable public policy decisions involving geological matters at local, state and national levels.

As the direct successor to Dr. Davis' survey, I personally can attest to the monuments that he created during his tenure at CGS, both statewide and nationally. It is particularly fitting that Jim Davis, a long-time friend of Ian Campbell whose career also greatly shaped the California Geological Survey, should receive this valued award named after his old friend.

Response by James F. Davis

As a very young staff member of the New York State Geological Survey I became acquainted with Ian Campbell when the New York Survey hosted the annual meeting of the Association of American State Geologists in 1962, during my second year of employment. In succeeding years, particularly after I became the New York State Geologist, I had opportunities to serve with Ian on many committees and directly witness his wise judgment and capable leadership.

I want to share some of my thoughts about the benefits to society that result when professional earth scientists voluntarily use their time to share geoscience insights with the lay policy makers. When these insights result in the policies achieving their intended outcomes, society in general benefits. During my career I have had the opportunity to see the public policy value of using my time in this pursuit. I encourage all of my colleagues "to be a voice for geosciences in public policy" as stated in the 2013-17 version of Strategic Plan of the Geological Society of America.

During the early and mid 1970s America experienced what I call the "environmental sensitivity awakening" in which the public came to expect that federal, state and local governments would implement policies to reduce environmental abuses. This result was achieved in part by applying geoscience insights in the government environmental management policies in order to create higher quality outcomes. Because of their constitutional role of assuring the health and safety of their citizens, the state governments played a big role this transition. Today, the use of geoscience insights in developing effective ordinances and regulations at all governmental levels to preserve the quality of the environment, is much more extensive than it was before the "awakening". The result has been the transformation from the concept of potentially using geologic insights in environmental management to today's reality. This reality encompasses land-use planning and development, waste disposal of all kinds, preservation of unique geologic areas and a host of other practices.

Yes, a lot remains to be done, but the use of geoscience insights are critical to the environment as we gain additional experience and accomplish further progress in this important area.

I am honored to accept the 2014 Ian Campbell Medal on behalf of myself and the staff geologists who served with me in both New York and California.