PENROSE MEDAL

Presented to Peter R. Vail

Peter R. Vail
Rice University
Retired

Citation by Robert M. Mitchum

Mr. Chairman, I am greatly honored to introduce Peter R. Vail, the GSA Penrose Medalist for 2003. When Peter Vail introduced the concepts and applications of sequence stratigraphy, the effects on stratigraphic geology and seismic interpretation were comparable to those of plate tectonics on structural geology. Pete's ideas on the unifying paradigm of eustatic cycles are probably as close to an original concept as most of us are privileged to see. Pete's worldwide experience with Exxon's exploration groups honed the concept into an immensely practical tool for hydrocarbon exploration and stratigraphic studies in general.

Pete was born in New York City in 1930. He graduated from Dartmouth College in 1952. He attended Northwestern University from 1952 to 1956 for his M.S. and Ph.D. degrees. At Northwestern, where I first knew him, he was greatly influenced by Professors Larry Sloss and Bill Krumbein, with their ideas on quantified facies mapping and unconformity-bounded cratonic sequences.

Pete began his career with Exxon in 1956 as a research geologist with the Carter Oil Company, an Exxon affiliate in Tulsa, Oklahoma. He and his lovely wife Carolyn reared a family of three children, who at first grew faster than his reputation. He relocated to Houston in 1965, at Esso Production Research Company, now ExxonMobil Upstream Research Company, and advanced to senior research scientist, the highest technical position.

In 1986, Peter was appointed the W. Maurice Ewing Professor of Oceanography at Rice University in Houston, where he has been a great influence on the lives of many students. In 1992–1993, during a sabbatical leave to France, he led studies of the sequence stratigraphy of European basins and revised and documented the eustatic cycle chart. He became professor emeritus at Rice in 2001 and still actively consults in Houston.

Pete's ideas evolved naturally from his first pioneering work on the importance of stratal surfaces in rocks as geologic time lines. He soon recognized the cyclic occurrence of bundles of strata he called sequences in well logs, seismic reflections, and outcrops. Observing that sequence boundaries appear synchronous globally, he postulated that cyclic eustatic sea level changes are major controls on stratigraphy, along with basin tectonics and sediment supply. Eustatic cycle charts, seismic facies analysis, and the accommodation model of cyclic deposition were developed as applications.

In 1975, the first outside presentations of these concepts were made, appropriately, at a GSA convention. In 1977, these concepts were published in American Association of Petroleum Geologists Memoir 26 as the first of many articles and memoirs.

All the early stratigraphic ideas were generated in the fertile brain of Peter Vail as spinoff from mapping and stratigraphic projects. Early studies involved well logs and outcrops, one of which was a study of the famous Eocene-Miocene unconformity in the Maracaibo Basin of Venezuela. Here Pete recognized Miocene onlap and facies changes in well logs. Many of the concepts of beds and bedsets are due in great part to the ideas of C.V. (Chuck) Campbell, an early co-worker.

Pete soon recognized the potential of seismic reflection data in stratigraphic interpretation. Against the advice of his supervisors, he transferred to geophysics and began work on the significance of seismic reflection patterns. One of his major premises was that seismic reflections follow geologic time lines of detailed physical bedding surfaces, rather than massive time-transgressive formational boundaries where the strongest impedances occur. This concept challenged commonly accepted ideas, and was widely questioned in the company.

His early years in geophysics were very difficult times for Pete. The value of his work was not recognized, and he was ranked very low in geophysical technical appraisals. In addition, he was subject to ridicule and opposition from other geologists as well. One well-known Exxon geologist, in his ridicule, goaded the audience in a large technical meeting into howls of laughter on how the seismic reflections must bounce off the backs of fossils. In spite of this opposition, Pete persevered almost single-handedly in showing the relationship of seismic reflection patterns to chronostratigraphy. This was the "Eureka!" event for Pete, because it showed that seismic data could be used for putting stratigraphy into a geologic time framework for mapping.

About 1965, Pete's work was recognized enough to establish a very dedicated and enthusiastic seismic stratigraphy research group. This was a very fertile period of exponential growth. Worldwide cycle documentation and exploration applications were tied into Exxon's worldwide exploration of continental shelves and slopes. Seismic facies interpretation was systematized, cycle charts evolved rapidly, computer applications and mapping techniques were expanded, and biostratigraphy was improved. In 1978, the accommodation model and the concept of systems tracts allowed interpretation of sequences in well logs and outcrops as well as on seismic data. This broadening of interpretation beyond seismic data led to the name change to sequence stratigraphy.

In 1977, AAPG Memoir 26 was published, marking the first outside publication on seismic stratigraphy. Exxon's contribution to this publication was released only after all exploration managers agreed that seismic stratigraphy had gone about as far as it could go in Exxon. Almost immediately after Memoir 26 was published, these same managers closed the door on outside publication for a long time after they began getting phone calls from other companies complimenting Exxon's generosity in releasing these concepts.

Pete has held many important roles in a variety of industry, government, and academic steering committees. He has been awarded the AAPG Sidney Powers Memorial Award, the Virgil Kauffman Gold Medal of the Society of Exploration Geophysicists, the AAPG President's Award and Matson Award for best papers, the Individual Achievement Award from the Offshore Technology Conference, and the Twenhofel Medal by SEPM—Society for Sedimentary Geology. His extensive publications and scientific citations indicate the significance of his research.

Above all, Pete's greatest characteristics still remain his integrity, his dedication to his family, and his faithfulness to friends, colleagues, and students. I consider it a great honor to have been part of his life. Ladies and gentlemen, let me present Peter R. Vail.

Response by Peter R. Vail

First, I want to thank the GSA committees and members who made it possible for me to receive this prestigious award. I also want to acknowledge and thank my colleagues who worked with me developing the concept and applications of sequence stratigraphy.

The roots of sequence stratigraphy started with a well log project in which John Sangree, Chuck Campbell, and I correlated what we then called marker beds. We developed a series of stratal patterns including offlap, downlap, and onlap. I showed these patterns to a seismic interpreter, a friend of mine named Paul Tucker, who told me one could see all these patterns on seismic data. He invited me to his office to see for myself. I was impressed and decided I should join the Geophysical Research Department.

To everyone's surprise, in the early 1960s I did manage to transfer but I found I had joined a group of theoretical mathematicians and geophysicists. My group leader told me I had no future with the company. I just did not know enough mathematics. Fortunately, I had a good friend in the department named Frank Branisa, who labored long and diligently, teaching me frequency spectra, bandwidth, and deconvolution.

During this period in the Geophysical Research Department, I learned of an Exxon well that was drilled on a structure basinward of a well that drilled a thick sand. The seismic reflection that coincided with the sand top was traced basinward across the structure by the Exxon interpreter, where he predicted the sand to be present, but the well found only shale and silt, and no sand. Why did this happen? No one seemed to know. I thought this would be a great project for me. Fortunately, management agreed.

After receiving the logs and seismic data, I decided the only way to solve this problem was to do the paleontology to determine the ages for the reflection interval in both wells. I managed to find Lou Stover, an Exxon paleontologist, who was available to work on the project. He found that the sand in the landward well was the same age as the correlative silt and shale on the basinward well with the structure. To test the idea that the reflection was following the geologic time lines and not the top of the thick sand, I contacted Frank Branisa to see if we could build an impedance model and simulate a seismic section from it. Exxon Research had an analogue equalizer machine that would suit the project just fine. I built a geological impedance cross section between the two wells. Frank produced a synthetic seismic section using a pulse that matched the cycle breath on the seismic section. He found that the synthetic reflection and the time lines—not the facies—change from sand to shale.

After this, we made several more synthetic sections for different areas where we knew there were major facies changes from our early well log correlation work. Two examples are published in *American Association of Petroleum Geologists Memoir 26,* section 5 (Payton, 1977). All of the synthetic examples showed a high-amplitude reflection on top of the sand. This reflection carried to the equivalent shale in the other wells, but lost amplitude. The high amplitudes stepped down or up to other reflections that followed the facies change from sand to shale. These examples supported the concept that seismic reflections tend to follow the time synchronous stratal or bedding surfaces rather than facies.

Following this discovery, I gave many talks where I was commonly ridiculed. One senior geologist accused me of proposing that the reflections were bouncing off the backs of fossils. Another suggested that I was telling him that what he was teaching his students was wrong. Time and experience prevailed, and now it is a well-accepted concept.

In the early 1960s, Exxon Research established a seismic stratigraphy section in the Geophysical Department with Mandy Touring as group leader. Other members were Howard Yorston, an experienced seismic interpreter; John Sangree, from the reservoir geology group; Mike Widmier, a geologist from Exxon operations; Bob Wilbur, a research geologist; Janet Teagarton, a computer programmer who later became Janet Wilbur; and me. This diversified group worked well together until, regretfully, Mandy Touring became ill. I was then appointed section supervisor.

Our approach to research, originally proposed by John Sangree, was to hold periodic meetings where we would suggest worthwhile research ideas as if we had unlimited funds. We would then discuss these ideas among ourselves and decide who would work on what. I was especially interested in stratal patterns we had identified in our early well log correlation work, so I continued to work on this project on high-quality seismic data from basins around the world. What I observed first was that the widespread unconformity surfaces characterized by onlap were the most logical to subdivide the section into major genetic intervals. As I observed these onlap surfaces and dated them with paleontological information, I found that the surfaces had the same ages and similar patterns in most basins around the world. In order to convey this observation, I drew a series of onlap charts that we converted into eustatic sea-level charts. While working on a project in the North Sea, I also observed genetic sedimentary packages we came to call sequences.

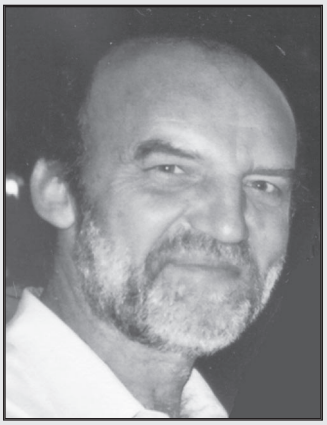
Bob Mitchum returned in 1969 from a two-year assignment in Midland, Texas. Upon his return to Exxon Research, he joined our group and became involved in many of our major interpretation projects before becoming the major author of *American Association of Petroleum Geologists Memoir 26.* In the mid 1970s, Jerry Baum, working on a thesis studying the Tertiary of the Atlantic coastal plain, recognized similar age sequences in his thesis area. When he graduated, he applied for and received a position with our group. In 1980, Rick Sarg joined our group to work on carbonate seismic stratigraphy. We then moved into a new building and our seismic stratigraphy section became the seismic interpretation section with Bob Todd as supervisor. At this time, I became a technical advisor and worked on a variety of projects. In one of these projects, I worked with Jan Hardenbol, Bilal Haq, and others to build the global cycle charts.

In 1986, after 30 years with Exxon Research, Rice University offered me a position as the Maurice Ewing Professor. This started my second career, one that I enjoyed greatly. I had many talented graduate students who added greatly to our knowledge of the global distribution and ages of sequences. During a sabbatical leave, my colleagues and I tested our concepts in the classical European basins. This study resulted in the publication of *Society of Economic Paleontologists and Mineralogists Memoir 60,* which documented and updated the global cycle charts. After 15 years with Rice, I started my third career, retirement, with a wonderful kick-off party called the Vail Fest, sponsored by Rice and Exxon. I received many wonderful compliments. My kids responded by saying, "If you're so smart, why don't you find us some oil?" That sounded good to me, so besides consulting, I decided to invest in some oil and gas wells. So far, I've been on a learning curve. I've learned that just because you find some oil or gas, it is not a discovery until you make money. And now, finally, I am beginning to get some return on my investments from several of the wells.

Again, let me thank all of your for this great honor.

DAY MEDAL

Dennis V. Kent



Dennis V. Kent
Rutgers University

Citation by Neil D. Opdyke

Professor Dennis Kent is a specialist in the study of the magnetism of rocks, and in its application to a very wide range of problems in the earth sciences, magnetostratigraphy, chronostratigraphy, marine magnetic anomalies, history of the geomagnetic field, and tectonics. He excels because of his mastery in the laboratory and because of the imaginative manner in which he applies his knowledge. He has authored or co-authored over 200 publications and is cited by Science Watch as having the second highest citation index worldwide among solid Earth scientists.

Kent's contributions to tectonics have been of great importance. He has demonstrated that the great arc of the Appalachians is a result of bending in plan taking place during the late stages of the Appalachian Orogeny. The result is based on careful high-temperature demagnetization of red Paleozoic formations in the Appalachian basin . His fact-based advocacy of the mobility of the various components within Pangea is vital to any understanding of late Paleozoic geology and history. These studies are ongoing.

A seminal contribution has been his work on time scales for Jurassic and later time (<175 m.y.) using a reevaluation of marine magnetic anomalies with Cande, which led to his development of a new Chron nomenclature now in use and an integrated magnetobiochronologic timescale for the past 75 m.y. These studies began in the 1970s and continue to this day.

Kent has produced a complete magnetic stratigraphy for the Newark System sediments in New Jersey which spans Middle and Late Triassic Epochs . This monumental study required the sampling and measurement of 7 km of sediment core requiring the complete thermal demagnetization of thousands of samples. It also required the development of a novel method for orientation of the bore core using the magnetic overprint. The magnetic stratigraphy has been dated by astrochronology and calibrated by radiometric dates. He is extending this work into the lower Jurassic of Connecticut and lower Triassic of the Mediterranean region. The magnetic stratigraphy of the Newark basin has subsequently been used to correlate and date the other Triassic basins of eastern North America.

Kent has very broad interest in the Earth and its history. His first paper was on ice-rafted sediments in the North Pacific, and recent papers have covered topics such as the uplift of Florence (Italy) and a possible meteorite impact at the Paleocene/Eocene boundary. He has demonstrated that the variation of the amplitude of the central magnetic anomaly <(800,000 yr) across strike is caused by variations in the strength of the main geomagnetic field and along strike to variations in mineralogy. His work on the magnetism of marine cores has yielded a data set that is widely used in models of the Earth's magnetic field.

Dennis brings a sense of gravita to his work—surprising perhaps in one so young. I have heard it said that he has a forbidding scowl, but that is a mistake, it is not a scowl; it is just that he is deep in thought grappling with some complicated Earth problem. Dennis richly deserves the Day Medal.

Response by Dennis V. Kent

Thank you, Neil, for the generous encomium. I feel overwhelmed and thrilled to receive this honor, especially coming from the professional society that I have belonged to the longest and that published my first paper more than 30 years ago when I was a graduate student. I am deeply grateful to the officers and friends of the Geological Society for making this wonderful occasion possible.

It has been my continuing great pleasure to work in the discipline of paleomagnetism, which admirably bridges geology and geophysics. Paleomagnetism is a young field, making it possible for me to have known many of its founders, such as the late Keith Runcorn, Ted Irving - a Day medalist - and of course Neil Opdyke, as well as to help this discipline mature, working with outstanding students, post-docs, and earth scientists of various stripes. The research has often involved fieldwork in exotic places and the use of nifty instruments such as the superconducting rock magnetometer in trying to understand phenomena on dimensional scales from sub-microscopic magnetic domains to the 6000-kilometer-wide core dynamo, and on temporal scales from the decadal fibrillations of secular variation, the many-million-year-long stochastic parade of polarity reversals, to the stately drift of the wandering continents, sometimes all in one study.

My introduction to the subject came at Lamont under the tutelage of Neil Opdyke in the late 1960's and early 1970's. Plate tectonics was in full swing - actually, a done-deal in many respects - but there were still lots of ideas to pursue, opportunities to go to sea, and plenty of stockpiled data, making the place a veritable candy store of research opportunities. I also met and married Carolyn in those years, got some papers published, and with an eventual PhD in hand, was hooked on making research a career.

I stayed at Lamont for another 25 years, largely with the beneficence of grants from the National Science Foundation. I had a succession of wonderful and productive graduate students who made me look good. There was Lisa Tauxe, who I would like to congratulate as this year's Woollard awardee, Dann Spariousu who worked on Appalachian tectonics, Brad Clement on polarity transitions, John Miller on Paleozoic remagnetizations, David Schneider on the dipole hypothesis, Bill Witte on the Triassic, Mickey Van Fossen on true polar wander, Vic DiVenere on Antarctica, and others, such as John Flynn and Anne Grunow, who worked in the lab as part of their thesis research.

I was also very fortunate to receive one of the first Doherty positions, a term appointment providing a level of institutional support that gave me the freedom to expand my research horizons beyond bootlegging off grants. Another source of deep satisfaction has been working with Paul Olsen on NSF-sponsored scientific drilling in the Newark basin and related projects in other Mesozoic rift basin in eastern North America, Greenland and Morocco.

I have been on the faculty at Rutgers for the past five years. This tenure has opened up new research directions for me, such as the Biocomplexity initiative with Paul Falkowski and Ken Miller and work on abrupt events in the early Cenozoic with Ben Cramer. I still

maintain strong ties with Lamont so I have plenty of time to listen to Joni Mitchell and Velvet Underground while commuting on the New Jersey Turnpike.

Finally, I would like to acknowledge some additional colleagues and friends of long-standing who have influenced my work: Bill Lowrie for the value of quantification, Steve Cande for how to read the message from magnetic anomalies, Bill Berggren and Marie-Pierre Aubry for a more philosophical appreciation of stratigraphy, time and life, and of course Carolyn and our daughter, Amanda, for their support, interest, and patience. There are others as well, who I hope will forgive my omissions in these brief remarks.

Dear colleagues and friends, I am inspired by this honor. Thank you for being here to share it with me.

YOUNG SCIENTIST AWARD (DONATH MEDAL)

Presented to Michael Manga

Michael Manga
University of California, Berkeley

Citation by Katharine V. Cashman

It is my great honor and pleasure to introduce Michael Manga as the recipient of the 2003 Donath Medal, presented by the Geological Society of America to a young scientist who has contributed "to geologic knowledge through original research that marks a major advance in earth sciences." Michael has met this criterion in several separate disciplines, all of which share the common theme of geological processes that involve fluids—volcanology, hydrogeology, geomorphology, and geodynamics. In each field, he illuminates the fundamental physics that underlies problems involving the dynamics of fluid movement through geological systems, including the movement of bubbles through liquid, magma through conduits, water through porous media, and diapirs through the mantle of Venus. Taken together, Michael's research combines mathematical elegance with an uncanny physical intuition that allows him to see the essence of a problem and, in the words of A.R. Ammons, to "fasten into order enlarging grasps of disorder."

Michael was born and raised in Ontario, Canada. His first scientific publication, an illustrated account of "The Great Blue Heron," appeared in the Macoun Field Club's annual publication in 1980, and was soon followed by the "Reptile and Amphibian Crossword Puzzle" and the "Canadian Trees Word Search." He received a B.S. in geophysics from McGill in 1990, an S.M. in engineering sciences from Harvard in 1992, and a Ph.D. in earth and planetary sciences from Harvard in 1994. At Harvard, Michael worked with Howard Stone in the field of low Reynolds number fluid mechanics, specifically on the motions of and interactions between bubbles rising through viscous fluids.

I first learned about Michael when he applied this work to one of my own areas of interest—bubbles in magmas. I remember that I first saw his name when I was responsible for assembling the VGP sessions for the fall meeting of the American Geophysical Union. At the time, I was working closely with Margaret Mangan on the behavior of bubbles in Hawaiian basalts. When I saw an abstract by M. Manga related to bubble dynamics in basaltic lava flows, I initially assumed that there was a typo, and I was surprised that Maggie had submitted an abstract without telling me! However, I soon realized my mistake, and, in what has become a pattern, that year at AGU I sat mesmerized while listening to the Harvard guy with the ponytail.

During his subsequent Miller Fellowship at the University of California at Berkeley (UCB), Michael not only continued his work on bubbles in basalt but also applied this work to geodynamics (postglacial rebound, diapirs on Venus) and hydrogeology (drop dynamics in branched tubes) while developing new interests in high-pressure experimental petrology and the hydrology of spring-dominated streams. It was at this point that Michael interviewed at the University of Oregon, and overwhelmed all of us with a talk that not only served as a fluid mechanics tutorial and multimedia showcase, but also melded seemingly disparate research projects into a coherent whole. We couldn't hire him quickly enough!

During his academic tenure, first at the University of Oregon and now at UCB, Michael has both delved more deeply into his established areas of interest and continued to expand his research frontiers. I am most familiar with his work in volcanology and hydrogeology, fields that Michael has taught me are closely related, at least in central Oregon. His work on bubble-bubble interactions has expandeπd to include the development of elegant experimental, numerical, and theoretical constraints on the effect of both bubbles and crystals on the dynamics of magma flow. He and his students have also used crystal and bubble orientations preserved within volcanic rocks as strain (or strain rate) markers. Michael's combined interests of bubbles in lava and groundwater hydrology of spring-dominated streams led naturally to an investigation of the permeability of porous basalts and of the effects of bubbles on hydraulic conductivity of porous materials. His work on springs includes investigation of the time scales of groundwater flow, advective heat transfer related to groundwater movement, and estimates of the rates of CO_2 degassing from the central Oregon Cascades. More recently, his research in this area has turned toward the response of streamflow to earthquakes. I list these areas of research not only to give you a sense of the problems that Michael addresses and to impress you with his phenomenal productivity, but also to illustrate his genius, which combines a profound physical intuition about fluid mechanics with the ability to see an important problem, simplify it to its essence, and solve it using a combination theoretical and computational analysis, analog experiments, and field observations.

Finally, a few words about Michael as a person. I have worked closely with Michael as a colleague, collaborator, co-supervisor of graduate students, and as a friend and I can honestly say that Michael is thoughtful, patient, and generous with his time (although we'll see how long that lasts with the birth of Miles to keep brother Max company!). He is a superb teacher, as evidenced by the Ersted teaching award that he received at the University of Oregon and by the Career Award that he received from the National Science Foundation. Michael is truly a rare academic who, in addition to being a talented and prolific researcher, is also a patient and inspirational teacher.

The sculptor Anne Truitt wrote that "there seems to be a law that the more conscious knowledge you develop, the more you can expand your consciousness." This statement encapsulates the excitement of Michael's science, where each step is amplified to reverberate through several disciplines. Mr. President, it is a privilege to present to you this brilliant scholar, outstanding teacher, and valued colleague for the Society's 2003 Donath Medal.

Response by Michael Manga

People often ask me what I do. I study geological fluid mechanics. The goal is to understand puzzling geological phenomena. This includes problems in volcanology, hydrology, geodynamics, and planetary science. I am particularly interested in finding

the relationships between different systems. For example, how do hydrologic systems interact with earthquakes? Ideally, these connections also provide new insight into both systems at spatial and temporal scales that might otherwise be difficult to study.

People seldom ask why I do what I do. I suppose the hazards represented by volcanoes and earthquakes, or issues connected to groundwater, are sufficiently obvious to most people. Yet for me and many of my colleagues, we pursue these problems for the shear thrill of discovery. So I am truly honored that the Donath Medal Committee, and those who wrote letters of support on my behalf, provide professional recognition for simply having fun.

I cannot take credit for all the work and ideas that result in my receiving this medal. Because our contributions rely on peer review, I must also acknowledge the broader community of paper and proposal reviewers. They have granted me, admittedly often reluctantly, the chance to disseminate our work and to support new and sometimes risky ventures. In addition, the ability of young scientists like me to have enjoyable careers owes much to mentoring by colleagues, from an early age through the difficult leap from being a student to being a professor, as well as the support of peers, students and family. There are so many people to thank and I can't mention all of them, except one: my wife Susan.

Professors are also teachers, but I realize that I learn as much from my students as I hope they learn from me. My students also provide the inspiration for new research directions. Of course, the graduate students with whom I have worked did much of the actual work for which I am being recognized, and they have made our research adventures more satisfying than they might have been otherwise.

To conclude, I would like to qualify one of my earlier comments. It is a passion for discovery and understanding that drives my research and teaching. However, I am acutely aware of our responsibilities as earth scientists. We do, in fact, address many important problems and can contribute valuable knowledge, insight, and guidance. We also have a special training and experience in integrating a variety of fields and interpreting imprecise and incomplete data to draw conclusions about complicated systems. Here, Fred Donath's contributions to environmental education and awareness provide a superb model we can all strive to emulate. I am indeed fortunate to have had the opportunities to study the Earth. I can only hope that in the future, people besides me may feel equally fortunate that I studied the Earth.

GSA DISTINGUISHED SERVICE AWARD

Presented to Sharon Mosher

Sharon Mosher
University of Texas, Austin

Citation by B. Clark Burchfiel

Sharon Mosher's service to GSA has been extraordinary. As chairperson of the ad hoc Committee on the Annual Meeting Programs, she was the driving force behind reorganizing the program structure of the meetings. Most members have regarded this reorganization as a major revitalization of GSA's Annual Meetings. At about the same time, she served as chairperson of the ad hoc Committee on GSA Strategic Plan, which developed the objectives and goals for our Society; this plan presently guides the continuing development of the Society. As president of GSA, she had to deal with the probably the most difficult problems any president of the Society has faced for decades. These included reorganizing the financial policy of the GSA as well as making major and difficult management changes. She made hard decisions when necessary. Sharon, along with her intersociety collaborators, including Robbie Gries of the American Association of Petroleum Geologists (AAPG) and Howard Harper of SEPM—Society for Sedimentary Geology, has been the prime mover from GSA to develop the publications aggregate. Her involvement in the development of the aggregate has been in all the organizational work as well as major fund-raising activities to support its continued progress. In addition, Sharon (with AAPG, the Society of Petroleum Engineers, and the Society of Exploration Geophysicists) has been very active in the development of the intersociety Virtual Student Expo, just now coming to GSA as a Web-based system that will provide opportunities for employers (industry, academia and government) and students to meet and interact worldwide on the Internet. I can think of no one, past or present, who has given so much to GSA as Sharon Mosher, this year's Distinguished Service Awardee.

Response by Sharon Mosher

Thnak You. I am very honored to receive GSA's Distinguished Service Award. It has been a great privilege to serve the society. I hope I have made some lasting contributions and leave the society more vibrant, active, and involved.

I have worked with many wonderful, dedicated people over the years who share my love of the society: fellow committee members—particularly on the Annual Program committee—councilors, officers, presidents, executive directors, and GSA staff. I would like to thank them all for their hard work, dedication, and friendship. I would also like to thank the leaders of other societies who have become collaborators and friends for your commitment to working for the benefit of all the geosciences.

Like many people, my involvement began with serving on GSA committees, chairing my Division, and then serving on Council, but it wasn't until after that, when I chaired the new Annual Program Committee, that I realized that members could make significant and positive changes to the society. The work of that committee, in restructuring and revitalizing the Annual Meeting, establishing field forums, and building stronger ties with affiliated science societies, convinced me that it truly was our society and we could each make a difference. Most of my other contributions, such as those on the strategic plan, global meetings, public policy, education and public outreach, alliances with other societies, and the electronic journal aggregate, were fueled by my vision for what GSA should be. Even those in finances, management, and governance were done so that GSA could effectively meet the challenges and opportunities ahead.

I have devoted a tremendous amount of time and effort over the years to GSA because I believe that scientific societies are extremely valuable to the advancement of science. They

- promote the exchange of scientific ideas, the dissemination of scientific findings, and scientific debate;
- nurture young scientists and students providing them with a forum for their research, opportunities for professional enrichment, grant support, help finding employment, and so on;
- instill in their members an ethical standard that governs scientific research and behavior; and
- bring scientists together to work toward a better public understanding of science and better science education.

Service to scientific societies is not just something that rounds out your vita—it is personally as well as professionally rewarding. Strong friendships, good times, broadening of one's perspective, personal growth and new skills, exposure to new fields of science—all of these come from giving of your time to your society. I would strongly encourage members, particularly young members and students, to become actively involved in your society. Take it from me—you won't regret it.

GSA has become a leader for the geosciences—forward thinking, flexible, innovative, progressive, youthful, and globally oriented with stimulating scientific meetings and publications—all because of a willingness to change. This is your society. It will become what you make it. It is up to you. Thank you again for this honor.

GSA PUBLIC SERVICE AWARD

Presented to Julia A. Jackson

Julia A. Jackson
GeoWorks and
American Geological Institute

Citation by Samuel S. Adams

The GSA Public Service Award was established in 1998, in honor of Eugene and Carolyn Shoemaker, to honor persons "who have advanced the earth sciences in public interest." Recipients have included Stephen J. Gould, Orrin Pilkey, Brent Dalrymple, and Eugenie Scott, and last year, John McPhee. This year, GSA honors Julia A. Jackson in recognition of her success promoting public interest in the earth sciences. That success reflects her extraordinary collaboration with thousands of scientists and non-scientists alike. Julie's story is one of productive relationships built upon the highest level of professionalism, respect and friendship, all for everyone's clearer understanding of the Earth around us.

Born and raised in the Upper Peninsula and then southwestern Michigan, Julie earned a geology degree from Wayne State University. Her contributions to awareness of earth science began as a docent at the Smithsonian's National Museum of Natural History. In 1975 Julie commenced an association with the American Geological Institute that continues today, serving at various times as employee, contractor, consultant, and advisor. Starting as a publication indexer, she went on to become editor of *Geotimes* and to play leadership roles in the *Glossary of Geology,* AGI's Environmental Awareness Series and Earth Science Week.

Julie's name first became well-known through her co-editorship of three editions of AGI's *Glossary of Geology* with Bob Bates. In 1997, she was the editor of yet the 4th edition of that fundamental reference work, which environmental lawyer Victor Yannacone has likened to the Rosetta Stone. Not only does the *Glossary* prevent our language from degenerating into babel, to paraphrase Ian Campbell's preface to the first edition, but the authority of the work rests on hundreds of geoscientists who reviewed definitions, added new terms, and cited references. These volunteers did not simply show up on AGI's doorstep Monday morning ready for work. They had to be found, cultivated, coached, and made to feel that they were "giving blood" for something worthwhile and that they were enjoying it. Thus we begin to see the magic that Julie spins in her relationships with people, all in the interest of making earth science transparent and joyful for anyone.

I must tell you a bit more about Julie's "people magic," because it plays such a role in all her achievements. People who have worked with Julie describe her as a beautiful person under all conditions. She neither offends nor takes offence. She is quiet, genuine, sincere, open-minded, and caring. In pursuit of her passion for helping people discover the joy of earth science, she is energetic, tireless, and persistent. As if that isn't enough, she once told me that she loves the challenge of doing a lot with a little, which was why starting Earth Science Week without a budget was so much fun for her! Now you begin to get the picture: a loveable, irresistible force with whom you want to share a task and take a journey.

Julie went on to edit and oversee publication of AGI's Environmental Awareness Series, in collaboration with Philip Lamoreaux and Travis Hudson. These colorful, non-technical booklets, with titles such as "Water in the Environment" and "Sustaining Our Soils and Society," are accessible and engaging to students, teachers, policymakers, and other lay readers. Julie's "people magic" was critical to working with the diverse contributors and anticipating the needs of the diverse readership.

It is, however, Julie's successful launching of Earth Science Week in 1998 that will probably become her greatest legacy. As chair of the AGI's 50th anniversary celebration that hatched the notion of Earth Science Week, I can testify to how little she was given to work with and how hard we prayed that she would be successful. In her inimitable style, she engaged people from every position and across the country to pitch in and share the excitement of earth science. She established a Web site for exchange of ideas and successes as well as Earth Science Week kits with posters, bookmarks, and activity booklets to promote participation. With significant support from the U.S. Geological Survey, GSA, and other organizations, Earth Science Week has gone on to generate activities in every state and many countries overseas. The success of this public awareness achievement for the earth sciences is due in large measure to the "people magic" of Julie Jackson.

Julie's acceptance of this award today, one year after John McPhee was similarly honored by GSA, continues a curious pattern. Julie similarly followed McPhee as recipient of the American Institute of Professional Geologists' 1999 Outstanding Achievement Award and again followed the distinguished writer as recipient of the Association of Earth Science Editors' 2002 Award for Outstanding Editorial or Publishing Contributions. There is nothing in the world like good company!

President Burchfiel, it is with the greatest possible admiration and joy that I introduce Julia A. Jackson as the 2003 recipient of the GSA Public Service Award.

Response by Julia Jackson

Thank you, Sam, and thank you, GSA, for giving me this opportunity to express my appreciation and to applaud your public outreach efforts. My interest in observing and understanding earth processes started young, and I am grateful to the family members, friends, and teachers who encouraged me.

My family moved from the iron country of the Upper Peninsula to southwestern Michigan when I was nine. While planting the garden, we found an unusual lumpy, tan rock about the size of my dad's fist. Could it a meteorite? I hoped so! We took the mystery rock to the curator of the Kingman Museum in Battle Creek, and I can still feel the excitement of watching him carefully examine this "treasure." Imagine my shock and wonder at learning that we had found a piece of fossil coral—evidence of an ancient inland sea that once covered the area!

My rock collection grew much faster than my knowledge, because, in those days, there wasn't much information available for kids interested in rocks. Fortunately for me, seventh grade science included geology. Mr. Caldwell, the school principal who taught the course, even took us on field trips. That experience increased my interest in geology, but I still couldn't find much about the earth sciences that I could understand. Then, I discovered

The Rock Book and other publications by nature writer Carroll Lane Fenton and his wife, geologist Mildred Adams Fenton. Their books gave me what I needed. Without their shining example, I doubt that I would be here today.

By the time I arrived at Wayne State University, I couldn't foresee whether geology would become my vocation or my avocation, much less envision a career at the American Geological Institute (AGI). I was simply pursuing my interests. I was and am still convinced that learning about the Earth and how it works is a good foundation for life and for any career path.

In the course of my work for AGI and with the member societies, I've enlisted hundreds of geoscientists—including many of you—to review and propose definitions for the *Glossary of Geology,* write articles for *Geotimes,* or organize Earth Science Week events. You generously continue to donate you expertise and time for the greater good of our geoscience community and society. Your willingness to help and give back never fails to impress me. You are the ones doing public service through your teaching, research, applied geology, and public outreach, and these efforts have never been more important.

Although geology is much more accessible today through books, television, and the World Wide Web than it was 50 years ago, the natural world has become less accessible – especially in urban areas. As geologists, we are uniquely qualified to help youngsters and adults grasp the relevance of the earth sciences and become stewards of the Earth. This job can't be done in classrooms alone.

Public outreach and informal education complement formal education and extend its reach. Rocks and fossils fascinate children. We should seize every opportunity to develop their innate interest in the Earth. I am privileged to have worked with AGI and with many geoscientists who share my conviction that outreach is a critical component of geoscience education. GSA's recognition of the importance of public outreach through programs such as GeoCorps, participation in Earth Science Week, and this award affirms your commitment. I applaud that commitment and encourage you, GSA, and your members to increase your public outreach efforts. Don't let the difficulties in measuring the effectiveness of geoscience outreach deter you. I know firsthand that experiences like finding a fossil or talking to a geologist can turn a child's eyes toward the Earth and the stars. Thank you.