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GSA Medals & Awards

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PENROSE MEDAL

Presented to Robert D. Hatcher Jr.

Robert D. Hatcher Jr.
University of Tennessee

Citation by Michael W. Higgins

Robert Dean Hatcher Jr. was born 22 October 1940, in Madison, Tennessee. He received B.A. and M.S. degrees from Vanderbilt University, and a Ph.D. degree from the University of Tennessee. He was assistant professor, associate professor, and professor at Clemson University, professor at Florida State University and the University of South Carolina, and he has been a distinguished scientist and professor of geology at the University of Tennessee since 1986. From 1986 to 2000 he was also a distinguished scientist at Oak Ridge National Laboratory.

Hatcher is a scientist with incredible energy, enormous drive, a superior scientific intellect, and an ability to get things done. He is prolific, with over 165 scientific papers; more than 140 of these are in refereed journals, and many invited. In addition, he has published eight books, 34 field trip guides, 12 technical reports, and more than 320 abstracts, and he has lectured by invitation at more than 60 different universities, including several foreign universities, at the U.S. Geological Survey, several state surveys, and the Russian Academy of Sciences (Siberian Branch). Bob has guided 35 M.S. students and 14 Ph.D. students to completion and has guided six postdoctoral research associates. He has had 34 successful grants, contracts, and other awards for research. Tireless, in his mid-sixties, Bob presently has seven M.S. students and three Ph.D. students working under his tutelage. In an age dominated by "black-box" and computer-driven geology, Bob teaches geologic mapping, but he teaches the students to guide and follow up the mapping with geophysics, geochemistry, and geochronology and to use computers to assemble and print quality geologic maps. Bob makes sure that his students get credit for what they have done by publishing with them as the senior authors in field trip guidebooks, maps, and published papers, and he makes sure they know how to speak before an audience at local, national, and international scientific meetings.

Bob is a member of the American Association of Petroleum Geologists, American Geophysical Union, Carolina Geological Society, Georgia Geological Society, and East Tennessee Geological Society, a Life Member of the Society of Sigma Xi, and a Fellow of the Geological Association of Canada, American Association for the Advancement of Science, and the Geological Society of America. He is a founding member of GSA's Structural Geology and Tectonics Division and a member of the Geophysics and International Divisions.

Bob is the only geologist to receive the honor of distinguished scientist in the University of Tennessee system, which has had only 13 distinguished scientists in its history. Bob has been president of GSA, the American Geological Institute, and the Carolina Geological Society and has received numerous awards for service, including the first GSA Distinguished Service Award. He has been a consultant to the Advisory Committee on Nuclear Waste for the U.S. Nuclear Regulatory Commission and a member of the National Research Council Reactor Safety Research Federal Advisory Committee. He was a member of the National Academy of Sciences Advisory Committee on the U.S. Geological Survey, Board on Radioactive Waste Management, and the National Committee on Geology.

Bob has organized or co-organized three Penrose Conferences, and he and his students organized and ran the 17th International Basement Tectonics Conference in 2004 and led two major field trips for that conference.

Bob was first to apply plate tectonics concepts to the southern Appalachians in his classic paper, "Developmental model for the southern Appalachians" and has modified the model as new data became available. Bob is one of those rare geologists who integrates field geology, petrology, geophysics, geochemistry, geochronology, and structural geology to decipher the geology of complex mountain systems such as the Appalachians, and he has the writing ability to publish his findings in clear, concise fashion.

In a mix of scientific service and scientific achievement, Bob's editorship with Bill Thomas of the *GSA Bulletin* during the 1980s resulted in bringing the journal back to its former status as the leading earth science journal and made major improvements in dissemination of scientific knowledge and he has worked diligently to improve the scientific quality of other aspects of the Society.

Bob served on the Site Selection Advisory Committee for the COCORP seismic reflection project and was part of the team of scientists that first documented that the Appalachian Blue Ridge and Piedmont are totally allochthonous, that the Brevard fault zone dips to the southeast as it would if it were a thrust fault, and that the Pine Mountain belt is a window. Hatcher led a consortium of geologists and geophysicists nationwide in proposing to drill an Appalachian ultradeep corehole to provide lithologic and real geophysical data from crustal rocks that would allow far better interpretation of seismic data. Bob's *Tectonic Map of the Appalachians* has been used in national and international syntheses.

In another action in which service and scientific accomplishment are intertwined, Bob assembled leading scientists for the GSA Decade of North American Geology volume on the U.S. Appalachians and Ouachitas. Bob's scientific standing is documented by eight Fellows, three of whom are Penrose medallists (Jack Oliver, 1998; John Dewey, 1992; Gary Ernst, 2004); three of the Fellows enthusiastically supporting his nomination (Albert W. Bally, Jack Oliver, and Bill Thomas) are past presidents of GSA.

For his scientific service, and especially his service to the Geological Society of America, his teaching, and most of all for his scientific achievements, Bob Hatcher has earned the Penrose Medal, the highest honor a geologist can attain and essentially the Nobel Prize for geology, except that it does not come with a large cash award—sorry, Bob. It is my pleasure and privilege to cite Bob Hatcher for the Penrose Medal.

Response by Robert Dean Hatcher Jr.

For many years, I have enjoyed attending GSA Presidential Address and Awards Ceremonies to hear the outgoing Presidents speak and to admire the great accomplishments of the medalists, without

considering the possibility that I would be standing here today to receive two of these great honors. For the Penrose Medal I thank citationist Mike Higgins for nominating me, those who wrote supporting letters, the Penrose Medal Committee for selecting me, the GSA Council, and particularly my family for their love and for tolerating my work habits for the past several decades.

I would not be here tonight, however, were it not for several mentors when I was a student and a young professional. Doug Rankin, 1950s Vanderbilt professor now USGS Emeritus, loaned me his Jim Thompson Harvard petrology course notes to read, bring to his office, and discuss with him when I was the only student undergrad petrology, for kindling my interests in igneous and metamorphic processes. Bob Barnes, Tennessee Division of Geology—now retired independent oil geologist—taught me field geology one-on-one, emphasizing the importance of careful observation in making detailed geologic maps. He kindled a spark in field geology that later would become a cornerstone of my career. And George Swingle, my Ph.D. advisor—perhaps more a philosopher—for encouraging me to think freely and synthesize geology based on sound data. Admittedly, crustal geology and processes became my primary hobby and avocation, and the backyard Appalachians became my lifetime playground, with side trips to collect other mountain chains.

During the 1970s three others filled gaps in my knowledge or opened doors abroad. Izzy Zietz, USGS Emeritus, taught me about potential fields geophysics. Jack Oliver, along with Sid Kaufman, Larry Brown, and several Cornell grad students and postdocs, taught me about reflection seismology. Bob Neuman, USGS Emeritus and National Museum of Natural History, got me involved in international geology. I also am grateful to the graduate and undergraduate students who have chosen to conduct their research with me. One of the greatest compliments they have paid me is that most are still willing to talk with me, consider me their friend, and even be considered part of my extended family. I also want to thank my office manager and assistant Nancy Meadows who for most of the past 20 years has held my office together, kept my students and I organized, and kept the bureaucrats off my back.

To put my life into a more geologic perspective, by ~7:30 tomorrow morning I will have lived ~1.2 x 10^{10} s (66 y). So, I would like to weave a tale of good luck—combining serendipitous and conscience decisions with a little work—that brought me here.

Robert Frost wrote in his poem, "The Road Not Taken,"

Two roads diverged in a yellow wood,
And sorry I could not travel both …

There have been many divergent roads in my life: many choices as to which to take were made serendipitously, while others were taken with clear and thoughtful decisions. Early-on my parents wanted me to become a chemist, a chemical or mechanical engineer, or a medical doctor. Then I took a geology course and realized that that was what I wanted to do, despite contrary advice from Vanderbilt geology department head Willard Jewell: the late 1950s were a down time in the cyclic employment-time curve for geologists. My parents were rather chagrined when I walked in and told them I was going to major in geology, with the response, "What is geology?" So, I did not heed Prof. Jewell's advice and completed majors in geology and chemistry, thinking I wanted to become a geochemist, then completed an M.S. in carbonate petrology and geochemistry. Although something beckoned me to return to pure chemistry and organic chemistry, ultimately I decided to stay in geology and seek a Ph.D. in geochemistry. This obviously was a good decision at a major crossroads for a number of reasons. Applying to work on a Ph.D., however, was very frustrating: I was rejected by several universities because of my poor early undergrad record, probably related to having started college at 16. One Ivy League professor—and Penrose Medalist—sent me a lengthy rejection letter saying that only a few should work toward the Ph.D., and I was clearly not one of them. This had a rather large impact on me for awhile on me, but there were still options and I decided to enter the Ph.D. program at the University of Tennessee, to become a geochemist. This was a conscious, but unknowingly serendipitously positive decision for my future for several reasons. My first year there was not a happy one, however, and I even considered transferring. This would have been a very bad decision! In the meantime, I worked summers for the Tennessee Division of Geology and enjoyed making geologic maps, but still thought I wanted to become a geochemist. After several frustrating attempts to begin a research project in geochemistry, a field project was begun in the Appalachian thrust belt in East Tennessee under structural geologist George Swingle. Sometime later I realized that I loved what I was doing; and might be pretty good at making geologic maps, synthesizing small geologic maps into larger ones, and trying to understand the results; so my Ph.D. was completed in structural geology.

In parallel with finishing the Ph.D. in 1965 at age 24, I met and married Diana Simpson, and accepted a position with Humble Oil and Refining Company in New Orleans. After a short time in New Orleans, two other young Ph.D.s in the same group and myself decided to seek academic positions. I accepted an offer from Clemson University, with the lowest salary of three offers. The decision to move to Clemson proved critical for my career, for in our back yard was some of the most spectacular, complex, and unknown geology in the world. After receiving an NSF grant to work on the Brevard fault zone, I realized that I was woefully undereducated to decipher the structure and stratigraphy of polydeformed metamorphic rocks. So, I read most of the 1950s and early 1960s papers on the structure of the Scottish Highlands, and again began to make geologic maps.

We had only an undergraduate program at Clemson, but each summer the most highly achieving undergraduates were invited to work with me in the field. Several became accomplished field geologists. Most have continued to involve field geology in their careers in the consulting, government, or academic worlds. There are numerous stories that could be told of the encounters of these undergraduates with snakes, bears, hornets' nests, and moonshine stills; of lost eyeglasses and wallets; and of triumphs of making interesting traverses along ridges and streams through the Carolinas and Georgia Blue Ridge rhododendron and mountain laurel thickets. There is no better way of stating the satisfaction of what we do in the field than the way Kay Behrensmeyer, National Museum of Natural History, said it this past summer:

Field geology is a process of solving space-time puzzles that depends on interacting with actual rocks ("ground truths"). Every outcrop represents a hypothesis that can be tested by going to the next outcrop—a never-ending process of discovery and increased understanding of Earth history. Future generations of Earth science students, teachers, and the public must have the opportunity to experience and be inspired by this process, for the good of geology—and science in general.

Bill Dickinson convened his "Plate Tectonics" Penrose Conference in 1969, and I was very fortunate to be invited—another major crossroads. Many participants, including myself, went home and wrote papers on the application of plate tectonics concepts

to the world in which we were working. Mine on the southern Appalachians was published in the *GSA Bulletin* in 1972.

In 1978, we moved to Florida State University, to work with graduate students, thinking my workload would be decreased to be able to spend more time with family and hobbies. Working with graduate students went as planned, but the decreased workload did not. Even so, after 28 years now of working with graduate students, I still enjoy teaching and working with undergraduate geology majors.

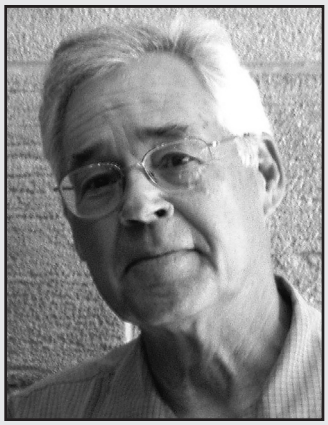
We moved to the University of South Carolina–Columbia in 1980, intending not to move again because of our ties to South Carolina. We were offered the opportunity in 1986, however, to return to the University of Tennessee–Knoxville and, after some debate, decided to do so, where we have remained for the past 20 years.

In closing, I consider myself one of the luckiest people in the world to have spent my career doing something I love, to have done some geology reasonably well, to have positively influenced the lives of a number of young people, and to have been a geoscientist in the most exciting time in the history of our science: the formulation and adaptation of the plate tectonics paradigm. Realize that the physicists and chemists witnessed this over 100 years ago with the formulation of atomic theory, and the biologists recognized organic evolution as fact and began formulating theories to explain it more than 150 years ago. No doubt plate tectonics theory and other foundations of geoscience will evolve, like the foundations of the other sciences. Geoscience also will not stagnate, with so many frontiers remaining to be explored on and in the Earth, and in our solar system, and discoveries to be made that will continue to challenge us. Let's hope that future geologists will continue to do legitimate field work on the most complex planet, not just go to the field to collect samples, but to make geologic maps—and teach young geologists to understand, make, and utilize them. And there is still some fieldwork left to do: I am not ready to play golf every day.

From the epitaph of W. C. Fields, "All things considered, I would rather be in Philadelphia." Again, my most sincere thanks for these medals; my debt to others is immense; this has been a very humbling experience.

ARTHUR L. DAY MEDAL

Presented to Frank M. Richter



Frank M. Richter
University of Chicago

Citation by E. Bruce Watson

The basis for this important medal is "outstanding distinction in contributing to geologic knowledge through the application of physics and chemistry to the solution of geologic problems." Given the emphasis upon both physics and chemistry, it is difficult to imagine a more appropriate recipient than Frank Richter. Prof. Day may not have intended that each year's medalist be skilled in both physics and chemistry, but Frank most certainly is. Indeed, his work is so diversified across geophysics, geochemistry, and cosmochemistry that the full breadth and depth of his contributions are appreciated by few individuals. I will briefly summarize what I feel are his major contributions, while at the same time try to paint a picture of this distinguished scientist and gentleman.

I have known Frank Richter for 20 years, and we began a formal (though intermittent) collaboration about 13 years ago when Frank and his gifted student Yan Liang came to me for help with experiments on diffusion in silicate melts. It is an unnerving experience to have Frank take an interest in your past work. It is flattering to realize that he might value your contributions, but he is so perceptive and insightful that you also know he will find all the weaknesses and probably do things better.

Frank's diverse contributions have involved two essential aspects that define his talent: he has an uncanny sense of key problems, and he has the ability to distill these problems down to a simple physical or mathematical essence or a strategic experiment. This has been true from the very beginning of his career when he tackled mantle convection and plate tectonics as a graduate student at the University of Chicago. Much has been written on these topics since Frank published his influential series of (mostly sole-author) papers in the mid-1970s, but I think it is accurate to say that his deductions about mantle convection have never been truly superseded or made irrelevant. Considering the advancements in computational power that have occurred over the past three decades?and ignoring Frank's own recent statement that today he could "write his entire thesis in a single page"?this is a remarkable thing.

After addressing layered convection and the thermal state of the Earth, Frank began to drift away from his early work in geodynamics, initiating a slow migration toward more strictly geochemical topics. As a collaborator and sometime competitor of Dan McKenzie, he explored the geochemical implications of melt segregation and migration, and their work formed the underpinnings of a whole new school of quantitative thinking about the chemical dynamics of basalt production. Frank then migrated closer to the surface of the Earth to develop, with Don DePaolo, quantitative relationships for fluid flow and fluid-solid interactions during carbonate diagenesis.

Frank's next path of scientific inquiry led into the realm of diffusion kinetics and the application of diffusion models to tectonics, geochemistry, and cosmochemistry. This began as a collaboration with Oscar Lovera and Mark Harrison on $^{40}Ar/^{39}Ar$ thermochronology, producing the multi-diffusion domain model that has been so fruitfully applied to problems in tectonics. Frank's more recent diffusion efforts have focused on multi-component diffusion in silicate melts and the mass (isotopic) effect on diffusion in fluids—both silicate melts and aqueous fluids at near-ambient conditions. I consider his efforts on the mass effect to be some of his best work to date, which is saying quite a lot. Frank defined the conceptual framework for this phenomenon and designed the experiments to measure its magnitude, as described in a seminal 1999 paper by Richter, Yan Liang, and Andy Davis. For the benefit of readers not familiar with the work, the bottom line is that, under some circumstances, isotopes of a given element having mass differences as small as ~2% can be fractionated during diffusive transport to an extent that is easily measurable and possibly significant in data interpretation (that is, at the several parts per thousand level). Given the proliferating technology for measuring isotope ratios, the need for understanding the factors that affect these ratios in nature becomes paramount. Frank Richter has put in place the foundation for a great deal of future work in this area.

While still pondering diffusion on Earth, Frank has also given considerable attention to outer space?specifically, to the processes affecting element and isotope ratios in condensates in the solar nebula. Through a combination of strategic experiments and rigorous theory, he demonstrated the effects of diffusion and selective evaporation on the major components of Ca-, Al-rich inclusions, and used these to place constraints on thermal histories of these materials. This work is remarkable in its power and rigor, and?like many of Frank's papers?will serve as a foundation for future experimental and theoretical work, as well as an interpretational framework for analytical studies of extraterrestrial materials.

In summary, for three decades Frank Richter has defined the state of the art in several fields, spanning geophysical fluid dynamics, chemical geodynamics and diffusion theory. He has not only laid the theoretical foundation for future work in all these areas, but also shown how his results can be used to address first-order geologic and cosmochemical problems. Please join me in congratulating Prof. Frank M. Richter of the University of Chicago as we honor him with this year's Arthur L. Day Medal.

Response by Frank M. Richter

Few things are as sweet as the public praise of one's peers – and especially so when the peers represent the Geological Society of America. This occasion makes me remember Julian Goldsmith, a past president of this Society, a long-time dear friend and mentor, and now sorely missed. He would often refer to the embarrassment of honors, something I didn't appreciate at the time given that I was long on sources embarrassment but short on honors. Perhaps he was referring to that nagging voice that keeps asking - do I really deserve this? You tell yourself, of course I do – but it's hard to keep a trickle of self-conscious doubt from creeping in. Arthur L. Day's intent was that the medal that bears his name should not only recognize achievement *but also inspire further effort* – and so perhaps he had the embarrassment of honors in mind

and how this could be used to stimulate the critical introspection so necessary for creative work.

I would like to share a bit of the sweetness and the embarrassment of this moment using the story of how the hawk and the cowbird approach geology. Earth Science is a natural science, and pure geology, as recognized by the Penrose Medal, is the very soul of our science. The pure geologists, like the hawk, live by their good eyes. They have to do a lot of looking and a lot of seeing (which is not the same thing) and then, in ways often not easy to explain, they have to sort through all that they have seen to come up with a compelling story about the Earth. Evidence of the subtlety of this style of geology can be seen in how long it sometimes take for what one person may have seen very clearly to become widely accepted. I'm at the University of Chicago where we love the story of J Harlen Bretz (no period after the J) who was the first to "see" that the extraordinary landscape of the channeled scablands of Northern Idaho, Washington and Oregon was the result of an otherwise unimaginable flood that devastated the area when the glacial lake Missoula burst its confining ice dam. After almost fifty years of ridicule and at an age of 96 years, Harlen's good eyes were finally recognized with a Penrose Medal in 1979. After receiving the award he remarked to his son that *"All my enemies are dead, so I have no one to gloat over."*

What success I've had in geology owes more to my imitating the cowbird than to the good eyes of the hawk. The cowbird, you may recall, places its eggs in the nests of other bird species and leaves the nurturing of its offspring to them. I've made good use of this practice by placing many of my students in foreign nest. For example, Neil Ribe (professor at Yale, now at Paris) did a large part of his thesis work at Columbia with Tony Watts using gravity and bathymetry data to investigate the origin of the extraordinary bathymetric roughness of the Western Pacific. Oscar Lovera, now at UCLA, made very important and elegant contributions to argon thermochronometry thanks to help from Mark Harrison (we're not quite sure where he is these days – somewhere between ANU and UCLA, or vice cersa). Another good example is Yan Liang, now a professor of petrology at Brown, who became a leading authority on chemical diffusion in silicate melts with lots of mentoring by my very close friend and citationinst Bruce Watson (RPI). And then there's Dan Shrag, who can't seem to decide what nest he came from, but who always speaks with great affection of his time at Chicago. There is, however, one important difference between me and the cowbird - I actually join my "offspring" in their foreign nest and we end up learning a new topic together. It's been said, with more than a bit of truth, that my students get their degree only after they have mentored me enough for me to pretend to some mastery of their thesis topic. Well, this is my chance to thank them and those that nurtured us in their nests.

In closing, I want to again thank the Geological Society of America for the Arthur L. Day medal, which has been made especially honorific by those that have been awarded it before me. And by way of highlighting the pleasure this award gives me and my family – my wife Theresa who is here tonight –my children Fritz and Emy, and Emy's husband Dan - I want to show you – actually I'll have to describe it for those too far to see it – a bumper sticker. Emy's children are too young for her to have a bumper sicker proclaiming her to be the proud parent of an honor student at such and such a school. Instead she has a bumper sticker that reads "Proud Daughter of a Geological Society of America Medalist". Thank you for the honor, and I'll be the better for the embarrassment.

YOUNG SCIENTIST AWARD (DONATH MEDAL)

Presented to
Elizabeth J. Catlos

Elizabeth J. Catlos
Oklahoma State University

Citation by T. Mark Harrison

Elizabeth Catlos is a remarkable young scientist who has already made outstanding contributions to geologic knowledge. Her trip to the podium tonight began with the arrival of Bohus and Eva Catlos' second daughter. Recently arrived political refugees from Czechoslovakia, Liz's parents instilled the émigrés ethic of hard work and an expectation of rigorous inquiry in their children; high among the qualities that led to this award are her integrity and extraordinary tenacity. With regard to the latter, I should explain that my principal qualification to introduce and praise Elizabeth is that I was her Ph.D. advisor. While Liz was comfortable with me offering her advice, she rarely availed herself of it. Her tenacity and scientific insight were demonstrated during her first graduate research project—the development of an ion microprobe method for dating allanite—a common accessory phase in notoriously difficult-to-date low-grade metasediments. In contrast to dating minerals of simple composition, such as zircon, allanite is a garbage can of variable substitutions and was expected to be difficult to calibrate. This was confirmed by preliminary measurements which indicated unprecedented matrix effects hundreds of times greater than for zircon with no known controls. I felt that continuation of this research was too risky for a beginning graduate student and strongly advised Liz to drop the effort. She respectfully declined, and her steadfastness was rewarded. She sought out and was awarded a predoctoral fellowship to the Smithsonian Institution to access its extensive mineral collection and use its specialized facilities to characterize a compositionally diverse suite of allanites. Her undergraduate specialty in chemistry aided the development of a new model for understanding allanite chemistry and led to the discovery of a relationship between rare earth content and inter-element ionization yields from which a dating method for allanite was developed. This tool permits a number of important problems to be addressed and has been used successfully in a variety of geologic environments. This spirit of perseverance has characterized her remarkable growth as a scientist.

Liz chose to apply her new method to understanding the tectonic evolution of the Main Central Thrust, the feature largely responsible for creation of the Himalayan range. As her field skills were, well, largely that of a chemist, I recommended an easier avenue which she again declined. Liz immersed herself in field courses and volunteered for a three-month stint as field assistant to a structural mapping party in remote northern Tibet. After this experience and two field seasons in the Himalaya, she documented the existence of surprisingly young crystallization ages adjacent the MCT across the length of the mountain range. A common point of departure for the numerous models seeking to account for the classic inverted metamorphic sequences across this fault—high-grade gneisses atop low-grade metasediments—was to assume that the two sequences were causally related through placement of the hot upper plate around 20 million years ago. Liz applied thermobarometric methods to these garnet-bearing rocks and recognized, for the first time, three distinct petrological domains within the Himalaya. Using in situ Th-Pb dating of inclusions in garnet, a method she co-developed, she directly determined the timing of the apparent inverted metamorphism and discovered the extraordinary fact that the structurally lowest domain was undergoing metamorphic recrystallization as recently as 3 million years ago. This work overturned 25 years of Himalayan models that have been widely exported to explain aspects of other orogenic belts and led to a radically different view of the evolution of the Himalaya. The picture that emerges is of continuous Himalayan convergence being manifested as out-of-sequence thrusting and intermittent magmatism while creating geological relationships with a high potential for imparting misleading clues. In terms of importance of petrologic problems based in the continental crust and applicable to understanding dynamic crustal processes, only a few of her peers can match this record of discovery.

Liz teamed up again with Sorena Sorensen at the Smithsonian to obtain quantitative timescales of aqueous fluid cycling in subduction zones. Using a clever scheme tying the addition of water to incorporation of large-ion lithophile elements during high pressure/temperature metamorphism and then coupling this to $^{40}Ar/^{39}Ar$ dating, she deduced timescales of between 25 and 60 million years for fluid-rock interaction in two subduction complexes. This work, published in *Science*, is further evidence of her thoughtful and original approach to addressing important and longstanding problems in earth science. As she undertook the dating in my laboratory, she of course first explained to me what the goals of her study were. I suppose I don't have to tell you what my advice to her was.

Liz has recently expanded her research along the Alpine-Himalayan chain and is using this opportunity to foster excellence in undergraduate research at her home institution, Oklahoma State University. She is a talented young scientist, a wonderful role model, and a deserving recipient of the 2006 Donath medal. It is with enormous pleasure that I introduce to you Elizabeth Catlos.

Response by Elizabeth J. Catlos

I am very happy to be here today to receive the Donath Medal. Where I stand now in my career is possible because of twists of fate and circumstance, but overall because I am doing what I love, and that is geology.

I want to first thank Mark Harrison, my advisor, role model, and mentor. His influence on my life and career is enormous. I came to UCLA with a Bachelor's degree in Chemistry and only 5 undergraduate classes in Geology. I owe a great debt of gratitude to Mark and to the faculty in UCLA's Department of Earth and Space Sciences for teaching me the basics of Geology. Mark steered my Ph.D., taught me the basics of isotope geochemistry, and allowed me the freedom to explore my interests. I know that my life would be different had it not been for Mark and his vision. He may have told me to

drop my focus on certain projects, but I always saw that advice as re-prioritizing goals.

My first project at UCLA was to develop an ion microprobe method to date allanite. This mineral is called a garbage can by most geologists I know. But as a chemist, I saw it as just too friendly to all of the elements in the periodic table. When our initial attempts at dating the mineral failed, I don't remember Mark telling me not to continue. I do remember him opening drawers outside his office, showing me 76 rocks from the Himalayas, and saying, this is your new project. That was the beginning of my research in the Himalayas, and Mark and I were part of a team that discovered the reactivation of a large-scale thrust in the range. Those 76 rocks were the foundation for new ideas about mechanisms involved during continental collision.

The allanite project lived on because of advice I was given by Marty Grove. Marty had confidence in me and that the dating method could work. He suggested that I contact Sorena Sorensen. I thank her for her mentorship and support. The most important perspective that I learned from Sorena is to begin with a firm understanding of mineral chemistry. We worked together for a summer at the Smithsonian Institution and when I returned to UCLA, I was given one day on the ion microprobe to see if the dating method would work. It did. After my Ph.D., Sorena contacted me about another idea: could we understand the timescale of fluid-rock interactions in subduction zones by dating barium-rich phengites? Marty Grove was instrumental on this project as well, and helped us with the basics of argon dating. Phengite was another mineral that was considered not ideal due to its propensity for excess argon. We again relied on our conviction that if we understood the basics of phengite chemistry, we could apply its ages to understand geologic problems.

I want to thank An Yin and Craig Manning, who were part of my Ph.D. committee at UCLA. They taught me the principles of field geology and developed my research skills. They helped me focus what seemed like an insurmountable amount of data into coherent ideas and models. An's mantra of "Just do it!" is one that I tell my students.

I also would like to thank Bill Carlson, Jack Cheney, John Ferry, Karen McBride, Frank Spear, and Matt Kohn, who supported my nomination for the Donath Medal as well as other pursuits. Matt taught me how to use an electron microprobe. I now have 2 electron microprobes in my lab, generously donated by ConocoPhillips. During my Ph.D., Matt and I worked together in the Himalayas. At Oklahoma State, Ibrahim Cemen suggested that we apply the principles we developed to understand collision to settings characterized by extension. Today, we conduct National Science Foundation supported research in Western Turkey and had an exciting field season with Cemal Goncuoglu and Mete Hancer.

I want to thank my Indian colleague and mentor, Chandra Shekhar Dubey. We conducted NSF-supported research in the Himalayas with Richard Marston, where I learned to appreciate connections between geomorphology and tectonics. Through Dubey, I was able to meet A.S. Janardhan who introduced me to the geology of the Southern Granulite Terrain in South India. Janardhan passed away in November of 2004, and an Indian newspaper wrote that his demise is a loss to the country. It was a loss to me as well.

I want to thank those who have supported my research program: the National Science Foundation and administrators at Oklahoma State, specifically those in the Vice President for Research Office and College of Arts and Sciences. My research is possible because of UCLA's National Ion Microprobe facility.

I thank my family for their support. My grandmother passed away on July 4 of this year. She graduated from medical school in Czechoslovakia in 1938. She survived World War II, but her husband, her parents, and her sister were killed. In 1968, she immigrated to the US, and, at the age of 54, learned English, how to drive a car, passed all board medical tests, and began her own practice. My parents had escaped Czechoslovakia in 1966 and came to the US with nothing but their education. My mother is a doctor and my father is an engineer. My father sparked my interest in science at a young age.

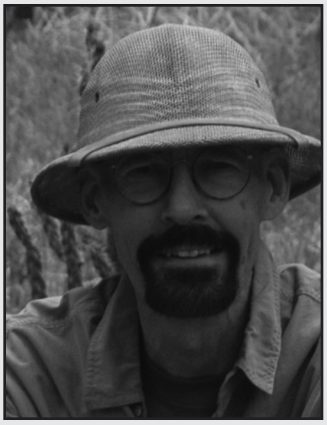
In closing, I thank the Donath family for this honor.

GSA DISTINGUISHED SERVICE AWARD

Presented to Abhijit Basu, David E. Fastovsky, and Roger L. Kaesler

Abhijit Basu
Indiana University

David E. Fastovsky
University of Rhode Island



Roger L. Kaesler
University of Kansas

Citation by Marion E. (Pat) Bickford

Abhijit Basu is a scientist who has received many national and international awards and honors and is the creator of a large body of work and publications. Tonight, however, we honor Basu for his service as GSA books science editor since 1996, during which time he has overseen the review and acceptance of more than 125 Special Papers and Memoirs and the evaluation of countless more proposals. During his tenure, Basu has earned a reputation as a science editor of highest standards, ensuring that GSA publishes only books of broad interest and high quality. In such a position, longevity like this would, on its own, be more than enough to warrant the GSA Distinguished Service Award, as anyone who has done the job can attest. But Basu has given GSA much more than time. He transformed the editor's role from one of evaluating whatever proposals came GSA's way to one that actively solicits high-quality book projects at non-GSA (e.g., International Geological Congress, Lunar & Planetary Science Conference) as well as GSA meetings. Under Basu's direction, GSA now produces 17–20 books per year. Prior to 1996, GSA produced half as many annually.

Basu also stuck by GSA during a time of disorganization at headquarters when he could easily have chosen to end his term after a stellar run as editor. His influence and steady support during that time helped bring GSA books to the successful and professional program it is today.

In 2003, Basu became chair of the Department of Geological Sciences at Indiana

Citation by Ben A. van der Pluijm

It is truly an honor and a personal pleasure to introduce our colleague and my friend David Fastovsky as the 2006 recipient of the Society's Distinguished Service Award. David has tirelessly served the Society since the 1990s, as a member of the Technical Program Committee and especially in various publications functions. In the latter roles, publications, the cornerstone of our Society, he served as associate editor for the *GSA Bulletin*, as a member and as chair of the Long-Range Planning and the Publications Committees, and, from 2000 to 2005, as editor of the journal *Geology*.

I first met David when he agreed to serve as co-editor of *Geology*, which soon entered tumultuous times at the Society. With a keen eye on the journal's responsibility to the earth sciences community to publish novel and exciting research and with a good sense of humor, David firmly guided the journal to become today's leading disciplinary publication in our field. As many authors can attest, the role of science editor involves sometimes unpopular actions, but David's decisions always placed the science community first. His editorial years generated many fun and interesting anecdotes that are better left for less formal settings than this ceremony, and some are, well, best left entirely.

I look forward seeing David's future ventures as he continues to display an unusual level of activity in his professional and personal lives. In the meantime, for his lasting contributions to the Society, I am sure you

Citation by Bruce S. Lieberman

Dwight Eisenhower said "true merit is like a river: the deeper it is, the less noise it makes." Roger Kaesler has had a successful career without making unnecessary noise. He's not only a fellow of the American Association for the Advancement of Science, he's the only person I know who's voted for every Republican since Eisenhower. Today we acknowledge the great and important contributions Roger made throughout his career: hundreds of scientific papers, including pioneering work in the study of climate change and evolution, and multivariate statistical analyses of fossils; the successful training of generations of students; and above all, his tireless work and distinguished service to the Geological Society of America, the University of Kansas (KU), and paleontology on behalf of the *Treatise on Invertebrate Paleontology*.

Roger helped rejuvenate the *Treatise*, increasing its productivity and output by diligently shepherding many volumes to completion. He spent tireless periods, in Darwin's words, "daily and hourly scrutinizing" a *Treatise* volume from initial layout to final production, and with great pride he used to officially present KU's chancellor with each new offering: unfortunately, I don't have any statistics on how many KU chancellors became brachiopod experts.

I think of Roger not only as a great scientist and editor but a cherished mentor, father figure, and friend. I owe a special debt of gratitude to the man who helped grow and guide my career with constant support and

Bickford citation *(continued)*

University. Again, this would have been a completely understandable reason to end his editor term, and yet he stayed on for 3 more years while GSA worked to find a successor.

Finally, those who know Basu well are aware that, more than a fine scientist, he also is a poet, a lover of art, and a connoisseur of wine and, of course, single malt scotch!

Response by Abhijit Basu

After killing Brutus, Mark Antony entered Cleopatra's bedroom and said: "I have not come here to talk." I am not Mark Antony, and, this is not a bedroom. So, I'll say a word. Let us work to make GSA the Everest of all geological publications as Jon Olsen, Jeanette Hammann and colleagues in the Publications Office are doing. Thank you.

van der Pluijm citation *(continued)*

agree that he is a most deserving recipient of the Geological Society of America's 2006 Distinguished Service Award.

Response by David E. Fastovsky

I am very grateful for this recognition; I am equally grateful, however, for the trust and honor bestowed upon me by the Society in allowing me the privilege of editing *Geology* for 6 years. During that time, the journal went electronic, saw its submissions double, and moved palpably towards being the most prestigious publication in the geosciences. With so healthy a journal, it was comparatively easy to navigate the roiled waters of publishing by professional societies.

The editorship was a strange cocktail of daily tedium and high drama. At >1 paper/day, one could hardly let things sit. Yet, the relentlessly high quality of the submissions required careful decisions. I remember regretfully a few that "got away," as well as some aggrieved comments that genuinely gave me pause for thought. In the main, though, a rotating, energetic editorship that adheres to the highest standards ensures that the best ideas in our field will appear in the pages of *Geology*.

In short space permitted (at *Geology*, we always observe size limits), I must acknowledge my redoubtable editorial assistant (my wife, Lesley), the Managing Editors (Faith Rogers, Anika Burkard, and Lyne Yohe), and the science Co-Editors (Hugh Jenkyns, Tina Neimi, and especially *mein alte freund* Ben van der Pluijm). Under Jon Olsen's leadership, GSA is blessed with a flexible, creative Publications Department whose real achievements are largely unsung. Finally let me express my gratitude to all the reviewers, whose thoughtful efforts constituted the real heavy lifting at *Geology*.

Lieberman citation *(continued)*

encouragement, yet he was also not above giving practical advice such as, "Never use the F-word in a faculty meeting."

This acknowledgement and recognition by the GSA, the preeminent scientific organization of our discipline, is one of the highest honors and appropriately recognizes Roger's wonderful achievements and dedication to service; the future of the Treatise is secure thanks to his skillful stewardship.

Response by Roger L. Kaesler

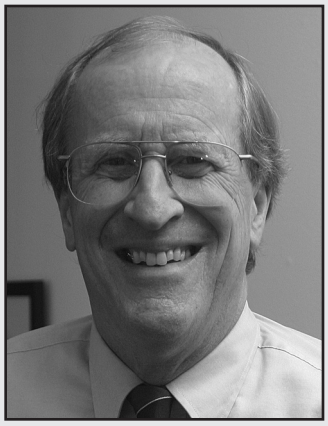
Unfortunately Roger is ill and regrets that he is unable to be here today. He has asked me to accept this award on his behalf and to respond for him. I can strive to emulate Roger, but that may be too tall an order. Even so, I will try to convey his persistent love and dedication to teaching, research, and service in the geological sciences and to the scientific community at large.

Roger is grateful and humbled that our society has chosen to honor him with this award. According to Roger, service to one's society is a great opportunity and privilege—not a burden or distraction from our research and teaching duties as many see it today. Roger has often related that service is an essential means by which we can engage and mentor our colleagues, both young and in their prime, to promote the constructive exchange, debate, dissemination, and education of scientific concepts. Through service, our teaching and research can be more effective by nurturing and encouraging future generations of geologists of all disciplines to become good stewards of science, science education, and our societies.

Roger would say, I challenge you, my dears friends and colleagues, to serve this great society as well as our sister societies and give of yourselves so that you, too, will be as enriched professionally and spiritually as I have been. Roger would like to thank those many individuals who have inspired him throughout his career to be a positive role model in every aspect of his life, whether it be a collegial academic or a good neighbor. On behalf of Roger, thank you very much for this great honor and recognition of his efforts.

GSA PUBLIC SERVICE AWARD

Presented to Richard A. Kerr



Richard A. Kerr
American Association for the Advancement of Science

Citation by Ann M. Cairns

The GSA Public Service Award was established by Council in 1998 in honor of Eugene and Carolyn Shoemaker. It is awarded to individuals who have significantly enhanced public understanding of the earth sciences.

We live in a time of rapidly expanding scientific knowledge and a time of high stakes for science-based public policy issues. The need is great for gifted individuals who can make sense of the science for others, and who communicate it in ways that engage, inform, and prompt positive action.

The Geological Society of America is pleased to honor just such an individual tonight. The recipient of the 2006 GSA Public Service Award is Richard A. Kerr, senior writer for *Science*, a publication of the American Association for the Advancement of Science.

Dick Kerr has written more than 1200 science-news articles over a career spanning nearly 30 years. His work is a delight to read. Dick places research in context, walks his readers through the research process and findings, explains associated debates and controversies, and illuminates the evolution of thought from previously published research.

Dick is respected for both the breadth and depth of his knowledge, amassed by scouring the scholarly publications, listening to countless presentations at meetings and conferences, and interviewing those whose work is on the leading edge of their disciplines. He understands emerging issues and developing trends. Numerous researchers have said that getting a phone call from Dick is a signal that they've made it.

Dick has been described by fellow geoscience writers as the head of the pack. They report reading him religiously every week, carefully monitoring what he covers and who he interviews.

Over the years Dick has generously mentored new writers. At *Science*, he has worked with a stream of interns from university science-writing programs, and counseled aspiring journalism and pre-journalism students who contact him for advice. It's fair to say that Dick's legacy will consist not only of his own body of work but of other science writers he has inspired and encouraged along the way.

Dick's journey into science journalism began with a B.A. in chemistry from the College of Wooster in 1968. He worked the following year as a research chemist in the Ocean Sciences Division of the Naval Research Laboratory in Washington, D.C.

Dick then served three years as an officer in the U.S. Navy, where he was assigned to the fleet oiler U.S.S. Ponchatoula. After completing his term of service, he headed for the University of Rhode Island, where he enrolled in the graduate program in oceanography.

While a graduate student, Dick's interest in pursuing a broader view of Earth and the environment asserted itself. Having once heard that science writing is basically a long career in graduate school, he enrolled in night courses in journalism on the sly.

In 1977 Dick completed his Ph.D. in chemical oceanography. He also hired on as an entry-level writer with Science, where his beat was geophysics. In three years, Dick was promoted to senior writer, covering earth and planetary science. Now he describes his beat as physical phenomena anywhere within the gravitational influence of the sun.

As Dick's list of published articles has grown, so has his list of honors received:

- In 1990 he received a Special Award from the American Meteorological Society for the "consistently high quality of his articles in *Science*."
- In 1993 he earned AGU's first Award for Sustained Achievement in Science Journalism.
- In 1994 the National Association of Geology Teachers acknowledged Dick's "excellence in geoscience writing" with the James Shea Award.
- In 1995 he was the recipient of AGI's award for Outstanding Contribution to Public Understanding of Geology.
- That same year he was elected a Fellow of the Geological Society of America, and in 1996 he received the University of Rhode Island Alumni Association's Excellence Award for Professional Achievement.

Tonight GSA honors Dick for the tremendous contribution he has made to public understanding of earth science. We celebrate all that he has accomplished and look forward to his work yet to be published. It is my pleasure to introduce Dick Kerr as recipient of the 2006 GSA Public Service Award.

Response by Richard A. Kerr

Thank you, Ann, for all those kind words. And most of all this evening, I want to thank you, the members of GSA, for making it possible for me to win such an award.

You see, they don't let me make much up at *Science*. Just about anything of consequence that I write comes from you and your colleagues in the broader earth science community. You're the ones who labor day in and day out in the lab and in the field to produce the exciting science that goes in the news sections of science. And it's you who answers my phone calls from out of the blue and spends half, three-quarters, and even a full hour of your busy day to explain what you've done, what others have done, why certain work is so important, or, sometimes, why I shouldn't be quite so excited about somebody else's work—all absolutely essential inputs to a news story. So I thank you all for your dedication, your expertise, and your generosity.

Always-helpful sources are vital, of course, but there's another indispensable group that gets no credit beyond having their names on the masthead. Editors shape stories and the words that tell them. I'd like to thank my first editor, Allen Hammond, who was the founding editor of the research news section of Science and hired me to cover geophysics. And two of my first-line editors (every story has two editors) stand out: Tim Appenzeller, now at National Geographic, and Polly Shulman, my editor of the past 5 years. Polly lives and works in Manhattan, but distance is no obstacle to her sensitive and expert handling of my copy.

Of course, getting the opportunity to serve the public for almost 30 years takes a long line of other people lending a hand and opening doors over the years—my

parents, who tolerated my early chemistry experiments in their kitchen; Miss Powell, my 8th grade English teacher who insisted on our diagramming sentences; Don Herbert, aka Mr. Wizard, who helped spark my first interest in science with his TV show; the chemistry profs at the College of Wooster, who insisted on your thinking in class, the lab, and the library; and Jim Quinn at the University of Rhode Island, whose guiding hand saw me out of grad school, degree in hand, just in time for a job at Science.

In closing, I'd just like to say how much fun it's been conveying your science to the public. Bringing the science of how the world works to the attention of the public, with your help, has been a thrill these 29 years. If it's been a service as well, then I have all the more reason to thank you.

AGI MEDAL IN MEMORY OF IAN CAMPBELL

Presented to Robert D. Hatcher Jr.

Robert D. Hatcher Jr.
University of Tennessee

Citation by Donald C. Haney

The AGI Medal in Memory of Ian Campbell is awarded in recognition of singular performance in and contributions to the profession of geology. Campbell was a geologist, educator, administrator, and public servant and was known for candor and integrity. The Campbell Medal is the most distinguished American Geological Institute award.

Robert D. Hatcher Jr.—husband, father, distinguished scientist, internationally recognized researcher, dedicated teacher and community servant—has all the attributes of Ian Campbell, for whom the award was established. Bob began his post-secondary education at Vanderbilt University, where he earned the B.A. and M.S. degrees. He completed the Ph.D. at the University of Tennessee–Knoxville, in 1965.

Bob began his professional career in 1965 as a petroleum geologist with Humble Oil and Refining Company in Louisiana, in the Southeastern Stratigraphic-Paleontologic Division. From 1966 to 1978, he was a professor in geology at Clemson University, and from there he went to Florida State University until 1980. Next he accepted a position as professor of geology at the University of South Carolina, where he stayed until 1986. In 1986, his alma mater beckoned, and he went to the University of Tennessee as a distinguished scientist and professor of geology, and he remains there today.

While at the University of Tennessee, Bob has simultaneously served as distinguished scientist at the University/Oak Ridge national Laboratory. He was also project director and chief scientist of the Appalachian Ultra-deep Core Hole Project, which involved some 80 scientists and 48 research institutions, and he was editor (with William Thomas) of the *GSA Bulletin* for 7 years. Bob served as president of many societies and professional organizations, including GSA and the AGI. He published over 200 referred papers, books, and reports, and he has presented over 300 papers at professional meetings. He has been a very busy person; his many other accomplishments are well documented.

Bob served on scores of national and international committees, boards, and foundations of the Geological Society of America, National Academy of Sciences, the American Geological Institute, International Geological Correlation Program–Caledonide Orogen Project 27, plus he received many national and international honors and awards.

Although he is no doubt very proud of his research and service accomplishments, I think Bob got the most gratification from teaching and directing student research. His dedication to field geology is well known, and if you were a student of his, there was always a strong element of field work in your research. Also, if you had the staying power, you would succeed, and you would have received a wonderful education. His dedication and loyalty to scores of successful undergraduate and graduate students will be his legacy.

Ian Campbell was this type of person: totally dedicated to profession, community, family, and friends. Robert D. Hatcher's illustrious career manifests itself in all these areas, and he truly represents the total essence of the Campbell Medal.

Response by Robert Dean Hatcher Jr.

Some 14 years ago, I had the privilege of standing on a similar stage as GSA Vice President to be the citationist for Don Haney, the 1992 Ian Campbell medalist. At that time, and for all time since, I did not envision myself as a potential recipient of this medal, having known most of the Campbell Medal recipients for the past 15 years: all are people I hold in highest esteem because of the highest level of their scientific and professional achievements. For that reason, and many others, it is very humbling to be named the 2006 recipient of the Ian Campbell Medal and to join the list of illustrious recipients. My most sincere thanks to Charles Gardner, who nominated me, those who wrote supporting letters, the AGI Ian Campbell Medal Committee that selects the recipients, my friend Don Haney for supporting me and being my citationist, and the American Geological Institute. Last year's recipient, Sam Adams, preceded me as AGI President, and I told him following his award that I could not think of a more worthy recipient of this medal. My opinion remains unchanged. Sam is no longer with us; the irony is complete.

I never knew Ian Campbell, but do know several who were either his students or colleagues during his days at Caltech or later as California State Geologist. All have lasting memories of an accomplished scientist, great teacher and mentor, and a person of highest integrity and dependability. Several have told me in the last several months what a wonderful mentor and person Ian was. These are qualities that all of us should strive to attain.

During my career I have been fortunate to have had several very successful managers as supervisors, to have known several others, and have taken the opportunity to try to understand why they were so effective. They have had considerable influence on me. These people are Bill Hardeman, former Tennessee State Geologist; Steve Conrad, former North Carolina State Geologist; David Dunn, former Dean at UT Dallas; Marcus Milling, former AGI Executive Director; Charlie Mankin, Oklahoma State Geologist; Jim Durig, former Dean at the University of South Carolina; and of course Don Haney. Each had a different and unique management style, but have all been very successful in their management of people and organizations. In addition, several effective teachers taught and influenced me, again each with a quite different style. They include Vanderbilt professors Willard Jewell, whose teaching brought me into geology, Doug Rankin, who taught me mineralogy and petrology, and Robert Wesson, math professor; and University of Tennessee professors Otto Kopp and George Swingle.

The thing that I would like to leave you with is that I have strived to produce good science, and let others judge its quality, to set an example for the many young people whom I have had a chance to influence, and to try to give something back to my profession through service. I continue to work to become the kind of person deserving of this honor.

Thank you very much for this honor. This is the finest day of my professional life.