MARY C. RABBITT HISTORY AND PHILOSOPHY OF GEOLOGY AWARD

Presented to
Sally Newcomb

Sally Newcomb
Silver Springs, Maryland

Citation by Sandra Herbert

Sally Newcomb has been one of the individuals whose efforts over the last thirty years have led to the currently vibrant state within our field of the history and philosophy of geology. Partly Sally's contribution has been from her publications; partly her contribution has been from her presence. As for all of us, her contributions sprang from her life. In my remarks I will try to show how her life and her contributions fit together.

Born in Williamsport Pennsylvania in 1932, Sally Fritz majored in chemistry at Purdue University, where she received her B.S. in 1954. Her chemistry major is important for it was through that door that Sally would eventually enter geology. Also in 1954 Sally married Robert Newcomb, an electrical engineering student at Purdue. Their children Gail and Rob were born in 1955 and 1956. Robert Newcomb took his Ph.D. in Electrical Engineering at the University of California, Berkeley in 1960. His teaching career has spanned continents, allowing Sally to travel as well. She reports that her travels left her with the feeling that "the world is often a friendly place." Sally's later work as an American member of INHIGEO has no doubt reflected that experience. Sally and Bob have been frequent participants in INHIGEO conferences abroad.

Sally first encountered geology at San Jose State University where she was a student from 1964-1967. Her goal was earning a California teaching credential. This required a more diverse major in physical science than chemistry alone. While at San Jose State she took a number of geology courses, in addition to those in physical chemistry. She reports that, "I was 'hooked' when, on a week's field trip to Death Valley, the geologist gathered us at the top of Golden Canyon and 'read' it like a textbook."

With her teaching certificate in hand, Sally began teaching both chemistry and geology, in a variety of settings beginning with the Palo Alto, California public schools and culminating in an eighteen-year career at Prince George's Community College in Maryland. Deepening her knowledge of chemistry in its relation to geology was a master's degree in Geochemistry and Education, earned in 1980 from the University of Maryland, College Park.

Sally Newcomb's first publication in the history of the earth sciences was an article in *Ambix* in 1986 entitled "Laboratory evidence of silica solution supporting Wernerian theory." In 1987 she earned her second master's degree, this time in the history and philosophy of science. Her thesis, done under the direction of Stephen Brush, was entitled "Contributions of British Experimentalists to the Discipline of Geology: 1780-1920." Twenty two years later, in 2009, she published *The World in a Crucible: Laboratory Practice and Geological Theory at the Beginning of Geology*. It appeared as Special Paper 449 from the press of the Geological Society of America. The book explores what Newcomb termed the paradox that so many geologists initially rejected: the Huttonian theory of the igneous origin for nearly all rocks, preferring instead to find the origin of many rocks from solution. The book describes the patient work by geological investigators seeking to resolve that paradox. In the book one recognizes Sally Newcomb's initial training as a chemist as well her later adoption of the science of geology. In the clarity of the book's treatment of such topics as geological instruments or chemical reactions one also sees her broad and diverse experiences as a teacher. She does not obfuscate. While every inch the scholar, she communicates at a level that everyone can understand. To mention just a small point, original sources are cited in the original language in the book, but translations are provided in footnotes. *World in a Crucible* will prove to be a standard work on the subject, nearly as valuable to historians of chemistry as to historians of geology.

In addition to her scholarly work, Sally Newcomb has been noteworthy for her presence in the discipline. For example, in 2001 at the GSA meeting in Boston, she was the co-convener of a Pardee Symposium and two topical sessions on "Ophiolites as Problem and Solution in the Evolution of Geological Thought." In 2006 at the GSA meeting in Philadelphia she co-led a field trip to sites in the city displaying research collections in the history of geology and paleontology. She has also served this division as its chair in 2001. Similarly she was a councilor for the History of Earth Sciences Society in 2004-2006. More informally, as I can attest, she has also provided ready assistance to those who ask her questions about laboratory procedures in the geological sciences.

To do all this of course has required some sacrifice. As she was becoming more active in exploring the history of geology, she gave up performing as a musician, the cello and the lute being her instruments. I can only feel some satisfaction that our field has provided her equal pleasures to those of music. I'm pleased to introduce to you Sally Newcomb, the recipient of the Mary Rabbitt award for 2011.

Response by Sally Newcomb

If I said I stood on the shoulders of giants in the history of geology, a number of them might object. It could be uncomfortable for them, because many of them are actually in this room. But of course, I do. Geology is known for its mentor relationships. Perhaps the necessity of being outside together in heat, rain, snow, and sleet has something to do with it. However, I've found "library" to be sometimes just as strenuous, which my colleagues here will well understand. Our field of the history and philosophy of geology must be even more notable for those relationships. There often seems to be little recognition of the field, and the number of practitioners world wide is only in the low hundreds. The good news, however, is that recognition is increasing, and we can all point with pride to a series of excellent books and collections of papers published in the last two decades, often by the Geological Society of America and the Geological Society of London, as well as by commercial publishers. Relative newcomers to the field such as China, Japan, South and Latin American countries, and the Arab world, are being

recognized, joining the European countries and North America.

My checkered career, anything but a straight line, can best be described as "sequential, not simultaneous." Unlike the admirable young women of today, I first worked as a biochemist, then had children, traveled as a family to my husband's Fulbright and other overseas positions, then went to graduate school and continued teaching when our children were grown. I taught science in primary grades in a museum setting in Palo Alto, substituted in 7th through 12th grade science in those schools, then taught physical science, biology, and anatomy and physiology at the Academy of the Washington Ballet, where the students were all preprofessional dancers. It has been a rich life. During my time at graduate school, I joined the physical science faculty at Prince George's Community College in Maryland and taught physical geology and inorganic chemistry. It is a large institution, just outside Washington D.C., with students from well over a hundred countries. Those positions were scarce, but a determining factor was that I had lived overseas and had hosted Bob's graduate students from literally around the world in our home. We joke that we can land at any airport anywhere in the world and one of Bob's Ph.D. students will be there to greet us.

Having written a paper on the history of chromite mining in Maryland for the final paper for my first Master's degree, I became interested in the history of geology, and how geology impacted present land and water use, economics, and the transport networks of a region. This led to study with the Committee on the History and Philosophy of Science at the University of Maryland, with one of those aforementioned giants, and Division award winner, Stephen Brush, as my major advisor. I quickly became aware that I was in a different ballgame, entirely unlike my previous technical studies and courses. That first course in historiography was more daunting than X-ray fluorescence analysis or petrology. The first paper I gave at a national GSA meeting was in Indianapolis. It was greeted with great tolerance, but I fear it must have been pretty bad, because I recall wrestling with primary sources and still writing the night before it was presented. I also recall how welcome I was made to feel, and how friendly people were at the division lunch, particularly Ellen Drake and Bill Sarjeant. Studies at the University continued to widen my horizons. I often felt schizophrenic because in the college setting I was supposed to be an expert, but was anything but in the history of geology.

The anomaly that ultimately resulted in The World in a Crucible occurred to me during this time. It seemed that the geology literature of the 18th century veered between theory and field work, and Hutton was sometimes called "the father of geology" in our textbooks and elsewhere. A theory would be proposed, and the natural philosophers of the time would go to the field to test it. But reading the literature, it was clear that theories were not supported by field evidence at least as often as they were. In another puzzle, it was hard to understand why, if Hutton's theory of igneous origin was correct, it took such a long time for the counter-possibility, deposition from water solution, to be falsified. As I started reading the experimental literature I appreciated the significance of the fact that rocks and minerals could be and were put into solution, and components of the solution including silicates, precipitated out sequentially. This was much more immediate evidence of an "aqueous" origin of crystalline rocks than a so-far hypothetical source of heat sufficient to melt them. And, being something of a contrarian, I rather enjoyed being a Neptunist, as well as becoming familiar with the excellent and ingenious chemical research of such people as Kirwan, Bergman, Klaproth, Spallanzani, Saussure, and etc. It became obvious that there was a "third leg" to geological knowledge, namely experiment, and that it was far more ubiquitous and influential than the cursory notice it received in the standard history of geology works. It has been my pleasure to continue to seek to untangle that tale, and to give an account of the many excellent natural philosophers who insisted on "interfering with nature" to the extent of experimenting on earth materials, in the 18th and early 19th centuries.

This quest has led to many happy hours discussing and exchanging ideas with colleagues.

The most rewarding part of taking part in HaPG activity has been the collegial relationships throughout the world that I have acquired, as well as discovering the excellent and often rigorous science employed by our 18th-century predecessors. This division of the Geological Society of America has provided a much-appreciated forum for the exchange of ideas and the introduction of new ones. I am most grateful that my work has been recognized. Thank you.