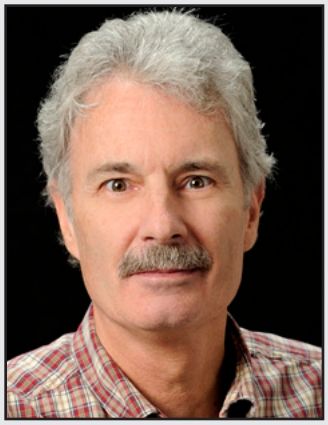
DISTINGUISHED GEOLOGIC CAREER AWARD (MGPV DIVISION)

Presented to
John M. Ferry



John M. Ferry
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Citation by Sarah C. Penniston-Dorland

John Ferry is a man of extraordinary intellect who has made significant contributions to the understanding of the role of fluids during metamorphism. Because of his work, metamorphic petrology now operates in an intellectual environment that links metamorphism to global change, volcanism, ore genesis and plate deformation. John recognized and characterized infiltration-driven reactions and the associated alteration of the chemical and isotopic compositions of rocks to quantitatively assess the amount and chemistry of fluid involved in metamorphic reactions. More than two decades ago, John recognized that the paradigm of static thermodynamic phase equilibria used in understanding metamorphism had been "squeezed dry" of new insights. He sought to transcend the limitations imposed by the time-invariant aspect of equilibrium models, and, throughout his career, has led metamorphic petrologists from a static towards a dynamic view of metamorphism.

From his earliest contributions John's work has made significant impacts on the field of metamorphic petrology. His most-cited work is an experimental calibration of Fe-Mg partitioning between biotite and garnet (Ferry and Spear, 1978), which is still a widely used geothermometer (1,206 citations as of this writing!). John has coauthored ten other papers that have over 100 citations, most of which quantify the composition and amount of fluid required for the progress of metamorphic reactions.

John's work has always been field-based, and includes all types of metamorphic environments—from his studies of regional metamorphism in Maine and Vermont, to studies of hydrothermal alteration on the Isle of Skye and in the Dolomites, to numerous studies of contact metamorphism including Notch Peak, Bergell, Monzoni, Predazzo, Onawa, Ballachulish, Beinn an Dubhaich, Ritter Range, and Mt. Morrison.

John uses a multidisciplinary approach to his research. He integrates field-based studies, quantitative modeling of heat and mass transfer during fluid-rock interactions, application of thermodynamic analysis and experimental determinations of mineral-mineral and mineral-fluid equilibria. His analytical techniques include detailed three-dimensional field mapping of fluid flow pathways, petrology and thermobarometry, major and trace element analysis by electron microprobe and LA-ICP-MS, calculations of reaction progress, and measurement of stable isotopic compositions (both in bulk and in individual minerals) through both traditional and clumped isotope thermometry.

What is it that makes John's work so compelling? John has a deep commitment to understand the rocks as they are. His is the sort of integrity that looks to the rocks to suggest working hypotheses for testing with measured data. Throughout his career, John's meticulous analytical protocols have solidly undergirded the once-extremely controversial conclusions he has drawn about the flux of fluids through metamorphic rocks and the time-scales for fluid-rock interactions in both pluton-related and regional metamorphic settings. No modern petrologist can ignore the implications of fluid fluxes during metamorphic processes, and this view can be traced to John's elegant work.

We are pleased that the Division of Mineralogy, Geochemistry, Petrology and Volcanology has recognized John for his decades of leading metamorphic petrologists towards active consideration of the flow of fluids, matter and heat during metamorphism through the awarding of its Distinguished Geologic Career Award. Congratulations, John!

Response by John M. Ferry

Thank you, Sarah, for your generous citation and my other students who wrote letters of support.

I'm proud to receive this award for two reasons. First, GSA has been my most important meeting of the year because it has a focus on continental crust petrology. The greatest honor is to be recognized by the group whose work means the most to me.

Second, the award specifically recognizes field studies. Members of the MGPV Division need little persuasion of the importance of fieldwork. One reason is that you go out in the field expecting to find one thing and make an unimaginable discovery of something else even more significant. A favorite example is Louis Alvarez's suggesting that iridium concentration might record sedimentation rate in a stratigraphic sequence Walter was studying at Gubbio, Italy. A similar, although less momentous, surprise brought me here. When I began graduate school in 1971, one of the hottest research subjects in mineralogy and petrology was subsolidus phase relations among plagioclase feldspars. Five years before, the peristerite gap was determined from feldspar compositions in metamorphic rocks. My first summer of fieldwork was to look for analogous miscibility gaps in more calcic plagioclases in metacarbonate rocks along a gradient from chlorite to sillimanite zones in Maine. Plagioclase compositions in the rocks proved bafflingly complicated, so I switched my attention to the petrology of the carbonate rocks themselves. This led to my first ideas about infiltration of rocks during metamorphism.

Even more importantly, however, fieldwork is the enterprise of mapping spatial patterns of countless different features in nature. It's these patterns, obtainable by no other means, that tell us how the Earth works. In my case, mapping the spatial distributions of mineral assemblages in metamorphic terrains at a range of scales revealed the existence, size, and fundamental properties of fossil fluid flow systems.

My field studies have been possible only in areas where stratigraphy, structure, and age relations are already worked out. Accordingly, my heroes among field geologists are those who do this. Many have shared their time and knowledge both in and out of the field getting me started at new locations, including Phil Osberg and Doug Rumble in New England; George Dunne, Cal Stevens, Rich Schweickert, and especially Sorena Sorensen in the Sierra Nevada; Dave Pattison and Ben Harte in Scotland; Bernard Evans and the

late Volkmar Trommsdorff in Switzerland; and Lawrie Hardie and Nereo Preto in Italy. Three people made pivotal contributions to my intellectual development. My Ph.D. advisor, Jim Thompson, grounded me in thermodynamics and phase equilibria. When I was 46, my postdoc advisor, Doug Rumble, took me on in his laboratory as an apprentice stable isotope geochemist. Lukas Baumgartner first tuned me into transport theory. My students have expanded my horizons by involving me in field problems I would not have explored otherwise, by developing theory and numerical simulations beyond my abilities, and by pointing out my earlier ideas that needed revision. Many people thus share in this award, and I thank them all.