# PARADIGMS AND VALUES IN GEOLOGY: IDEAS FOR ATTRACTING UNDERREPRESENTED PEOPLE TO AMERICAN GEOLOGY.

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The lack of women and American minorities practicing geology in the U.S. is well documented and has continued throughout the 1980s despite attractive funding and simple curricular changes to enhance hands-on experiences. Studies done outside the sciences reveal a number of explanations for this paucity of people we need to attract to science and suggest that current geologists need to analyze the values underlying the practice of modern geology.

Recent critiques of science remind us that a religio-political decision three centuries ago established a paradigm of thinking mechanically about the earth (supported by the clockmaker analogy). Science moved away from an earth-centered perspective preferring models of separation by a distant observer. 1960s philosophies revealed that such a model was not inherently objective and in fact might limit human ability to understand natural phenomena. Early geologists chose to separate inorganic and organic studies which recently ceased in considering environmental issues of the 1980s. Simple linear reasoning, depending on Aristotelian dichotomies, building hierarchical models from atoms to plate tectonics (intro texts), valuing competition, seeking control over nature (despite the lessons of earthquakes) were all part of the traditional paradigm for research and attracting students.

The Gaia paradigm affords an alternative perspective which is essentially non-anthropomorphic. Weaving an ecological web of interconnected cycles, it avoids the linear appearance of geology's water and rock cycles and eliminates hierarchical reasoning as we discover that no part of the web has primacy. It places the observer back in the natural world where empathy may be a greater value to understanding than separation. Examples of the differences that these paradigms could make for teaching introductory geology are easily discerned by analyzing current text books.

Traditional geology has ignored the value system that historians and philosophers have discovered underlying our education. By discussing alternatives in class, faculty can open the field up to groups of people with different perspectives. A Navajo student once wondered how westerners could have lost the sense of nature. Feminist critiques of science can be tested by discussing these value systems. Principles of ecofeminism, deep-ecology, Native American spirituality, and even Aikido can all contribute to this discussion. To meet the demographic

challenges of the 1990s, we need to be responsive to the perspectives of under-represented groups of people. Geology, in particular through environmental and natural hazard issues, has the opportunity to bridge the artificial gap between humanities and sciences.