

Obituary

Jane Gray (1929–2000)

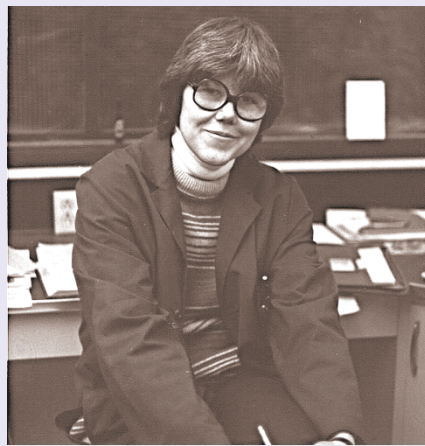
Jane Gray, a controversial figure in palaeoecology, died of acute liver failure caused by cancer on 9 January 2000. She was especially known for proposing a startling new interpretation of the invasion of land by life, a view that was at first almost universally resisted but which has now become a part of the standard view. Gray was a tenacious fighter for her ideas and so was regarded as 'difficult' by many people. But those who knew her best found her to be a generous, original and acutely intelligent colleague.

I first met Jane Gray in 1983, at a meeting of the American Association for the Advancement of Science, where she had helped organize a symposium entitled "The Greening of the Continents". I was in attendance as a novice palaeontologist (having spent a few decades as a systematic biologist before being attracted to the study of fossils). Gray and Arthur Boucot presented their evidence, based on microfossils including spores, for the presence of plants on land in the Caradocian epoch (Ordovician period), now dated at 458–449 million years ago.

Her presentation met with strong opposition from the formidable Harlan Banks, William Chaloner and others, and the discussion became somewhat heated. I remember whispering to Ian Rolfe (in jest), "These people are ready to kill over spores!". But I came away with the impression of Gray as fully capable of responding, with a withering command of the evidence, to any challenge.

Gray's personal code, intolerant of misbehaviour professional or otherwise, was undoubtedly formed by her family background, with its roots in the military establishment. Both her father (Colonel E. B. Gray) and uncle were West Pointers. She herself was educated in geology at Radcliffe College, Massachusetts (now part of Harvard University), and was introduced to palaeobotany by Elso Barghoorn. Most of her future work would be in palynology, the study of pollen systematics, especially from geological deposits. But Gray always considered herself a palaeoecologist, although she had an acute eye for systematic detail and a full command of spore taxonomy.

In 1952, Gray became one of the first recipients of a National Science Foundation Fellowship for study abroad, and sharpened her skills in pollen analysis with Johannes Iversen in Denmark. Her PhD came in 1958 from the University



Palaeoecologist who specialized in study of the colonization of land by plants

of California at Berkeley, under palaeobotanist Ralph Chaney, and she retained a life-long loyalty to that institution.

The 1950s and 1960s were not particularly female-friendly times in science, and Gray's uncompromising personality and readiness to defend her work made her rise through the academic ranks difficult. 'Anti-nepotism' regulations made it impossible for Jane and her husband, Antone Jacobson, to work at the same institution. Long periods of separation eventually led to a divorce.

After her move to the University of Oregon in 1963, Gray had worked almost entirely on problems in the palaeoecology of the Tertiary period (roughly 65–1.6 million years ago). But on his arrival in 1970, Boucot urged her to begin investigating the early invasion of the continents by plants. Her first evidence pushed the date back to the early Silurian period, about 430 million years ago, and later, collaborating with Boucot, to the Caradocian. Her most recent work, on spores from Arabia, pushed the date back a further 10–12 million years. The opposition of the palaeobotanical establishment made funding difficult to obtain. But Gray was as astute at playing the stock market as she was at interpreting the fossil spores, and used her independent wealth to fund her own research.

In Boucot, a palaeozoologist and specialist in marine invertebrates known as brachiopods, Gray found an ideal collaborator, and together they began to

explore early palaeoecology from an eclectic viewpoint. Gray and Martha Sherwood-Pike discovered the earliest terrestrial fungi, and Gray and Boucot possibly the earliest terrestrial animal remains in the early Silurian Tuscarora Formation in Pennsylvania. Her interests continued to be diverse, and she wrote on topics ranging from redwood trees to the unicellular euglenoids. A signal accomplishment in 1988 was an exhaustive book, *Paleolimnology: Aspects of Freshwater Paleoeology and Biogeography*, published by Elsevier. Seminal work on early animal remains appeared in 1993, in an article that took off from the Tuscarora fossils to outline an evolutionary framework for the development of the animal component of the first terrestrial ecosystems.

One of Gray's most lasting contributions was the creation of a spore-zonation framework for land plants of the Ordovician–Silurian, based on size and ornamentation of spores, and their occurrence in tetrads, dyads and as dispersed single spores. In her interpretation, this work documented the successive appearance of liverworts, mosses and vascular plants (or their ancestors) on land.

My own brief collaboration with Gray was rewarding. Her way of looking at old evidence anew, and her editorial acuity, helped us produce a widely reprinted article on the evolution of terrestrial systems. My last encounter with Gray, at a meeting of the Geological Society of America, was delightful as always, but raised concern for her health — she had suffered for many years from diabetes, and her liver problems had begun to emerge.

Obviously weaker physically, she remained mentally sharp. Indeed, the many projects in train at the time of her death showed her interests to be even broader than before. Still to appear are an article on controls on Earth's atmosphere before about 400 million years ago, a monograph that will question current models of the carbon dioxide and oxygen content of that early atmosphere. A huge manuscript, *The Evolution of the Nonmarine Ecosystem*, is only partially completed. Gray's massive collection will be moved to the University of Sheffield in Britain. Her works, published and unpublished, constitute a rich palaeoecological legacy of fact and theory.

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