

Bruce Velde (1938–2024)

Bruce Velde was born on 30 November 1938 in Chicago, Illinois. He grew up in the suburb of Lombard, did his undergraduate studies at the University of Illinois at Urbana-Champaign from 1956 to 1959 (some may remember the loud blue and orange Illini jacket he wore to the lab, to his wife's dismay), and his doctorate in Missoula, Montana from September 1959 to December 1962, on a Federal graduate fellowship and under the supervision of John Hower, who remained a source of inspiration for Bruce over the years.

His time in Montana was very formative, and he retained a great love for the American West and its people. His French colleagues may have noticed his enduring fondness for native American silver belt-buckles. Five and a half years from high school to doctorate seems rather short by modern standards, especially considering that he was married at age 17 and had two children, in 1956 and 1959 (the marriage ended in 1961).

Bruce then went to the Geophysical Laboratory of the Carnegie Institution (Washington, DC) for a 2-year post-doctoral fellowship from 1962 to 1964, and that is where he met Danielle. She was on a Fulbright fellowship for two years and had to return to France. They were married in Washington on 21 July 1964, sailed from New York on the *SS France* on 5 January 1965, and never returned to live in the US except for the year 1976 which was spent at the Geophysical Laboratory. Bruce thus left the US at age 26, speaking no French, and converted enthusiastically to the French way of life, especially the food and wine; in other ways he always remained an American, enjoying the impunity that being a foreigner in France gave him to break the rules he knew full well (such as the intricate ones governing the 'vouvoiement', which he gleefully ignored). What made him an American? If nothing else, his appearance, that of a cheerful, handsome, but smart football quarterback; 'straight as an arrow', optimistic, and open to life. He had Midwestern roots and inherited part of the family farm near Manito, Illinois, where his ancestors had settled in 1866 and about which he cared very much, visiting it every few years. 'You can take the boy out of the farm but you can't take the farm out of the boy', he once said.

Upon his arrival in France, Bruce was recruited as a CNRS researcher in the Petrology Laboratory of Professor Jean Jung at the Sorbonne University. At the time, a very unhappy candidate complained that 25% of the four positions open that year were for Americans! He spent the early years of his career at the Sorbonne, where he hosted John Hower over the 1967–1968 academic year. In the early 1970s, together with Danielle, they moved to the Jussieu campus, still on the left bank of the river Seine. At the request of Professor Martine Lagache, an experimental petrologist, he moved back up the hill to the Geology Laboratory of the Ecole Normale Supérieure in ~1980, where he stayed until his retirement (2013), and even after, as Bruce came to the lab until 2023.

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Throughout his scientific career, Bruce Velde maintained a sustained interest in the mineralogy of clay minerals, and, in particular, the micas. He developed this sustained interest in a variety of geological contexts, however. His PhD thesis was devoted to the significance of illite polytypism in terms of origin in sedimentary rocks, before he explored experimentally the stability domains of phyllosilicates and of micas in particular. As a CNRS researcher, he first applied this approach to high pressure–high temperature metamorphism contexts, and steadily moved towards surface conditions during his career, exploring weathering contexts (hydrothermal and others) for which he developed the concept of 'micromilieu' (local conditions), sedimentary diagenesis as in his PhD thesis, and finally, soils, with the impact of cropping practices on soil clay mineralogy.

This sustained interest relied also on the continued and expert use of chemical and physical methods of solid characterization (electron probe micro-analysis, infrared and Raman spectroscopies, and X-ray diffraction). He used these methods with emphasis on quantitative approaches and on their pioneering application to finely divided clay minerals, but also to archeological relics (especially Gallo-Roman pottery and medieval stained glass). What these were really introducing to Clay Science was the rigor of physical chemistry. He also helped to develop innovative ternary diagrams to represent these quantitative chemical data, allowing us to decipher intricate clay mineral chemistry in a simple and straightforward way. Working on rock and soil fracturing, Bruce also used and triggered the



development of methods of image analysis to quantitatively assess fracture networks. The quality and breadth of this pioneering work and its impact on Clay Science, were recognized in 1998 by the Clay Minerals Society George W. Brindley Clay Science Lecture Award.

The diversity of Bruce's scientific interests led him to develop many collaborations, especially in Paris, where he and his family were living and working, and in Poitiers, close to 'La Percerie', where in the early 1970s Danielle and Bruce bought a small farmhouse close to Danielle's

ancestral village and childhood war home. At the time, Poitiers was one of the few places in France with a small but active group working on clays, weathering and soils. Bruce's worldwide collaborations are too numerous to list here. His lifelong friendship with Dewey Moore may be singled out, however. It started when they were both undergraduates at UIUC, but interestingly none of their few common articles is devoted to clay minerals.

I am sure all of Bruce's collaborators remember him as being eternally enthusiastic about everything he did, and fueling these collaborations every day with a constant stream of ideas, some good, some not; he was always ready to hear colleagues' views about them! Throughout his career, Bruce was also able to transfer this enthusiasm to students under his direct supervision in Paris or to students and young colleagues he was mentoring in Poitiers, several of them pursuing an academic career (Pierre Barré, Andreas Bauer, Daniel Beaufort, Steve Hillier, Bruno Lanson, Mounir Medhioub, Alain Meunier, and Elisabeth Nicot). In addition to the wealth of articles published during his career, Bruce was also keen on transmitting his knowledge through textbooks on clays, their origin and properties, but also on archaeometry.

Bruce passed away on 9 August 2024 in Paris and is now resting close to his beloved and famous *Sequoia gigantea* which he planted in 1993 in La Percerie where he loved to go many times every year in all seasons ('I have to cut the grass' was often the pretext). This was and is his home, and Poitou became his terroir. He loved all the cheeses of France, but there was nothing superior to a 'chèvre bien affiné' with a glass of good wine to share with relatives and friends. Many of us have lost much more than an inspiring colleague.

Bruce Velde is survived by his wife Danielle, four children, two by his first marriage in the US (Scott Velde and Sheryl Rosa) and two by his marriage with Danielle (François and Henry), six grandchildren (Nicholas, Monique, Zachary, Mélusine, Hadrien, and Olivier), and several great-grandchildren.

Bruno Lanson with the precious help of Danielle and François Velde, Shelley Roberts, Pierre Barré, Andreas Bauer, Georg Grathoff, Steve Hillier, and Alain Meunier