



From left to right: Neil Irvine, Bill Brown, Brian Upton, Adrian Finch and Tim Harrison, in the valley of one of the giant dykes on Tugtutôq, South Greenland, in 1988.

Personal reminiscences

We (my wife Maryse and myself, Daniel) first met Bill in 1973 at the University of Nancy, when he arrived as a professor from Paris and we arrived as DEA students from Grenoble. At that time he was already an eminent specialist on feldspars. We started our careers by investigating Corsican ophiolites, and our frequent discussions of igneous petrology with Bill were precious for our thesis work. After finishing her thesis, Maryse worked with Bill and Jean Macaudière on the deformation of the Harris anorthosite and related pseudotachylites in Scotland. They worked in the wind and the rain that Scotland is famous for, and the other liquid Scotland is famous for helped to support their morale. Fortunately, I worked with Bill in warmer countries, on the ophiolitic gabbroic cumulates of the Kellaki massif in Cyprus, and our field season coincided with the Limassol wine festival! We also worked with Christian Moreau and Daniel Demaiffe on the alkaline ring complexes in the Air, Niger. Together with Christian Moreau and Jean Paul Karche, Bill described a fascinating rock from this area: the monzoanorthosite from the Taguei massif with zoned plagioclase and granitic intercumulus material, with cryptoperthites in the K-feldspar. Our Air field trip in 1991 was particularly memorable. We were intercepted in the Adrar Bous by two pick-ups with Touareg rebels armed with Kalachnikovs and demanding our tyres. We negotiated with the rebels and ended up only with a good scare. In October 1992, Bill and I visited New Caledonia to study the occurrence of boninites, fascinating volcanic rocks devoid of feldspar. Though it might seem the height of absurdity to ask a feldspar specialist to study feldspar-free rocks, Bill's expertise allowed us to understand the origin of these rocks – the absence of feldspar could be explained by the suppression of their nucleation in a water-rich melt under rapid cooling conditions. Bill's last research project, carried out with Mike Toplis, was devoted to studying the microtexture of cumulates from the Skaergaard igneous complex, in Greenland, which they visited in September 2001.

Bill was greatly appreciated by his colleagues and was curious about all aspects of life. As a scientist, he was known for his sound judgement and for his logical and hierarchical organization of the facts. I will always remember the discussion he had with a famous French geochemist concerning granite. The geochemist detailed the chemical composition of granites. Bill replied that they are used as stones to build houses in Celtic countries!

I (Ian) first met Bill in 1964 when I was a post-doc in Manchester where he had a lectureship. He was working with Doug Grundy on the effect of temperature on the cell dimensions of alkali feldspars and they were experimenting with a single crystal X-ray camera inside which was a tiny Bunsen burner, no thicker than a match, which warmed a cleavage fragment glued to a thermocouple. This was my first encounter with the ingenuity of experimental mineralogists. In 1966, Bill moved to France and I lost touch with him until 1977 when, at a meeting, we discussed two-feldspar geothermometry. At the time all geothermometers treated the feldspars as two separate binary systems, which was wrong, because all feldspar phases are ternary solid solutions. In 1981 we published a graphical ternary two-feldspar thermometer, outlining the thermodynamic relationships which underlie all the computerized versions involving Margules expansions that have appeared subsequently. In 1993 Bill wrote the definitive paper on ternary feldspar–liquid–vapour relationships, resolving years of argument about the cotectic or peritectic character of the ternary field boundary. This phase diagram tour de force is not for beginners and its infrequent citation says more about the commitment of modern petrologists than about the outstanding scholarship of the author. Bill's best

known early paper (1974), with Chris Willaime, is concerned with the orientation of coherent exsolution lamellae in alkali feldspars, and must be one of the earliest applications of the then relatively new electronic computer to problems in mineral physics. They calculated the boundary elastic energy for lamellae in specified orientations from cell parameters and elastic stiffness coefficients of each phase, and hence found the orientation with minimum energy. Their predictions have stood the test of time as TEM work has revealed the orientations of lamellae in a wide range of perthitic alkali feldspars.

Bill and I co-authored 23 papers in journals and books, mostly on feldspars. We would sit on opposite sides of a desk and write sections decided upon in advance. We sometimes argued energetically, but once a solution had been agreed, calm good-fellowship would soon be restored. Very occasionally, when he was concentrating hard, Bill would ask me a question in French, an action certain to fail. I suppose he was thinking in French but writing in English, and I sometimes thought his sentence structure revealed which language he was thinking in at the time. Many of our papers involved a remarkable layered syenite in South Greenland, the Klokken intrusion, which turned out to be a Rosetta Stone for alkali feldspar studies. Our first paper (1983), still one of very few large-scale applications of TEM to a field-based problem, required an enormous amount of hard preparatory work, largely on Bill's part, but led ultimately (1990) to our appreciation that coherency strain energy in perthites drives recrystallization reactions affecting large volumes of the crust. Bill took part in four of my Greenland expeditions, was always stimulating and always more than pulled his weight. I have a lasting and affectionate memory of Bill, pumping a kerosene stove beneath a bubbling pot with his one hand, in a flapping, rain-lashed tent.

I spent in total many happy months in Nancy, staying with Bill and his charming wife, Françoise, and watching their delightful children grow up. Thank you so much, Françoise, for putting up with our strange obsession with the feldspars!

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