Formative Events

Geologists, like Earth herself, experience outstanding formative events during their careers, events that shape their perception of the Earth and their chosen field of science. For me, one such event involved the scene below, the Blossville Kyst of East Greenland at 68° North. The photograph was taken in 1974, on what was rather grandly called the British Universities East Greenland Expedition, led by a great friend, Peter Brown. We hired a Norwegian sealer and sailed out of Aberdeen into the teeth of a considerable gale. Eight days of supreme discomfort found us in the Denmark Strait, northwest of Iceland, in calm seas and a thin fog. A sizeable whale circled our small, slow ship. The sea developed a curious oily motion, and floating ice started to appear. The sky began to lighten. Suddenly, startlingly, we burst out of the fog into a world of dazzling brilliance and clarity, of sea-ice and glaciers and jagged, black mountains extending unbroken to the north until they vanished around the curvature of the Earth. The skipper stopped the engine and the ship hung silent in the mirror of the sea. Scientists and hard-bitten crew alike, unable to find words.

Almost all the rock shown in the picture is basalt. The basalt coastline continues to the north for 450 km, to the mouth of Scoresby Sund, and the basalts extend inland for nearly 200 km before they are engulfed in the Inland Ice. Some basement rocks and Mesozoic sedimentary rocks crop out in the hinterland of the left part of the picture, and the pointed mountain rising from the sea at the extreme left is part of one of the most famous and influential of all igneous intrusions, Skaergaard. The snow-capped mountains on the distant skyline, all basalt, are the highest mountains in the entire Arctic, reaching 3693 m (12,116 feet) in Gunnbjørn Fjeld. Basalts cover at least 80,000 km^2 to a maximum depth of 7 km. The exact age range is uncertain, but the best evidence suggests that most of the lavas were extruded in less than 5 Myr in the Palaeogene, in flows up to 300 km^3 in volume. An awesome scene and an awesome formative geological event.

As a youngster I chose to become a geologist because the profession offered the prospect of working in wild, poorly known places. Only as time passed did I discover that understanding the Earth on the kilometre scale required more than mere gawping or even careful mapping. There was equal excitement to be had in work at the nanometre scale. Earth scientists have built themselves a discipline of quite extraordinary ingenuity, opening windows on the past which take us back to the birth of our planet. Geochemists can measure the isotopic or trace element compositions of tiny volumes, sometimes containing only a few thousand atoms, and tell us not only the ages but often the sources of magmatic rocks. Mineralogists use electron microscopes which give lattice-scale resolution and, with the atomic force microscope, can map individual atoms, so that we can understand the way minerals react and aspects of their often long histories. We can experience 'the pleasure of finding things out' (to use Richard Feynman's phrase) at scales from the global to the atomic, with the added dimension of geological time, which even we find hard to imagine.

Somehow, the excitement of this endeavour has to find its way into schools, the early years in universities, the popular science media, and onto the radar screen of policy makers and politicians. This is one of the reasons that *Elements* came into being. The editors hope that, with your help, our inaugural year, 2005, will be seen to mark a major formative event in the development of geochemistry, mineralogy and petrology.

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