

'Challenger' ran two airgun profiles. However a full year earlier Alan Grant as Chief Scientist on 'Sackville' had run a profiler line on a cruise "to investigate the geologic structure of the northeastern terminus of the Appalachian System". Our two sets of profiles defined what are now known as the "Enigmatic Mounds" along the northeast margin of Orphan Knoll. Canada never went back to the Knoll for 40 years. In the meantime a 1971 dredge haul near the base of one of the mounds gave an indication of Devonian fauna that were known only from bedrock in the centre of the Arctic Archipelago and which could not have been moved by glacial ice into the Atlantic Ocean at any time in the past ca. 15 000 years. The information got into a footnote in the Leg 12 Initial Report (1972) but was rejected by Nature. Alan Grant, however, picked up on it and flew with it in GSC and CSPG publications (Devonian of the World - a 1988 CSPG Memoir 14). Ruffman and others had put it all in a drawer and almost ignored the samples until their August 1995 special issue of 'Scripta Geologica' firmly put the Palaeozoic origins of Orphan Knoll back on the table. In 2010 the ROPOS ROV on 'Hudson' looked at ahermatypic corals on two of the mounds and attempted to sample bedrock unsuccessfully. The cruise participants have suggested that the Enigmatic Mounds may be tilted blocks of Miocene sediment. The debate on the origin of the 300 to 600 m high mounds continues.

Ordovician/Devonian bedrock on Orphan Knoll? Was Alan Grant ahead of his time?

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The Geological Society of America's 'Decade of North America Geology' bedrock geology map of the continent shows Palaeozoic sediments in about 1 500 to 1 800 m of water approximately 450 km northeast of Newfoundland. Alan Grant was almost single-handedly responsible for this small aspect of the 2005 GSA 1:5 000 000 map.

In 1969 the author nominated Orphan Knoll as a drilling site for the Deep Sea Drilling Project. The July 1970 Site 111 of 'Glomar Challenger', Leg 12, proved the continental nature of Orphan Knoll. Traversing the Knoll