

**PETROLIFEROUS CORE FROM A DIAPIR EAST OF CUMBERLAND SOUND, BAFFIN ISLAND**

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A 65 cm long drill core composed of dark grey mudstone was recovered by **CSS Hudson** on October 7, 1980 from a ridge structure believed to be of diapiric origin at 64°16.9'N, 61°55.8'W off Cumberland Sound on the Baffin Island continental shelf. The core was recovered by means of the Bedford Institute underwater electric rock core drill.

Preliminary examination at sea indicates that the sample material is poorly lithified and has a mottled, apparently chaotic appearance. The core sample gave off a strong petroliferous odour and bubbles emanated from the core upon recovery.

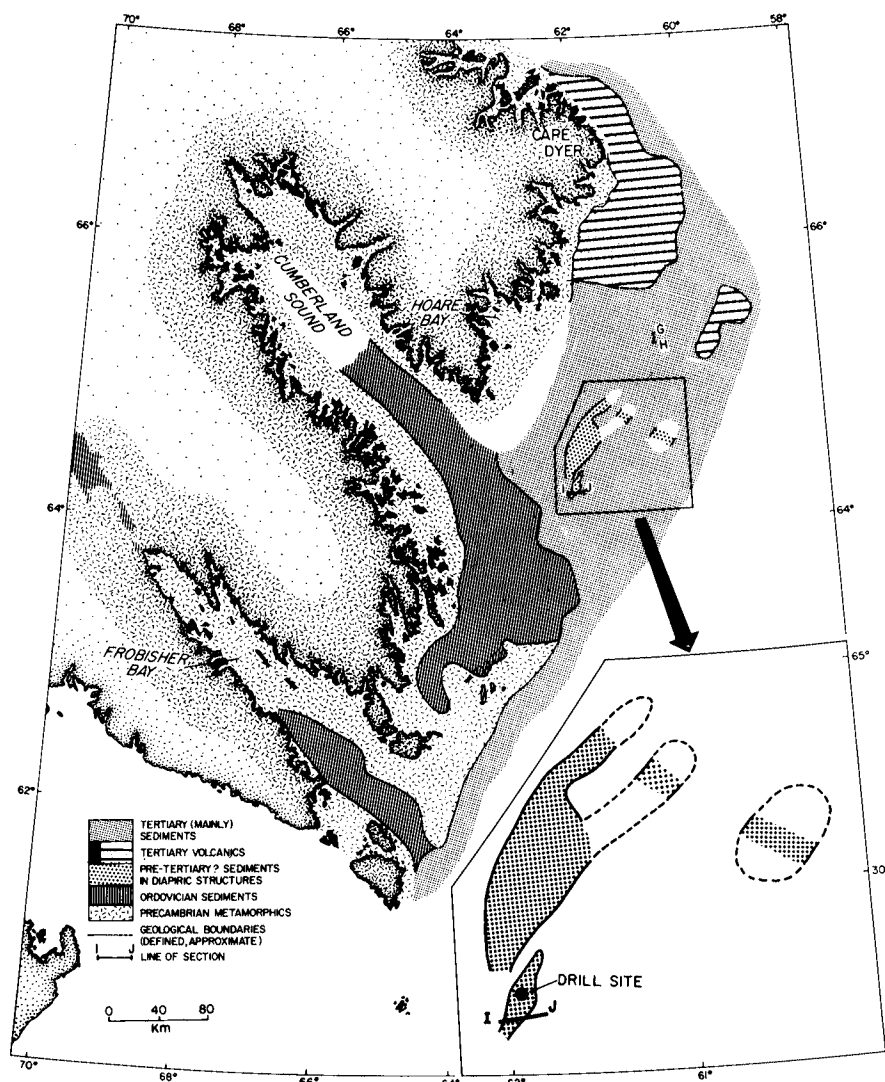
The sample locality (Fig. 1) lies on a northeasterly trending structure previously delineated and reported by MacLean and Falconer (1979). The locality is 5.5 km north of the seismic profile across the structure shown in Figure 2.

The material forming the core of the structure typically is acoustically opaque such as might be caused by the masking effect of gas. The presence of gas bubbling from the core strongly supports this conclusion. In addition to the core material itself, samples of the overlying unconsolidated sediments and of the water column were collected for chemical analysis to provide a further indication of whether gas may be escaping naturally into the sea.

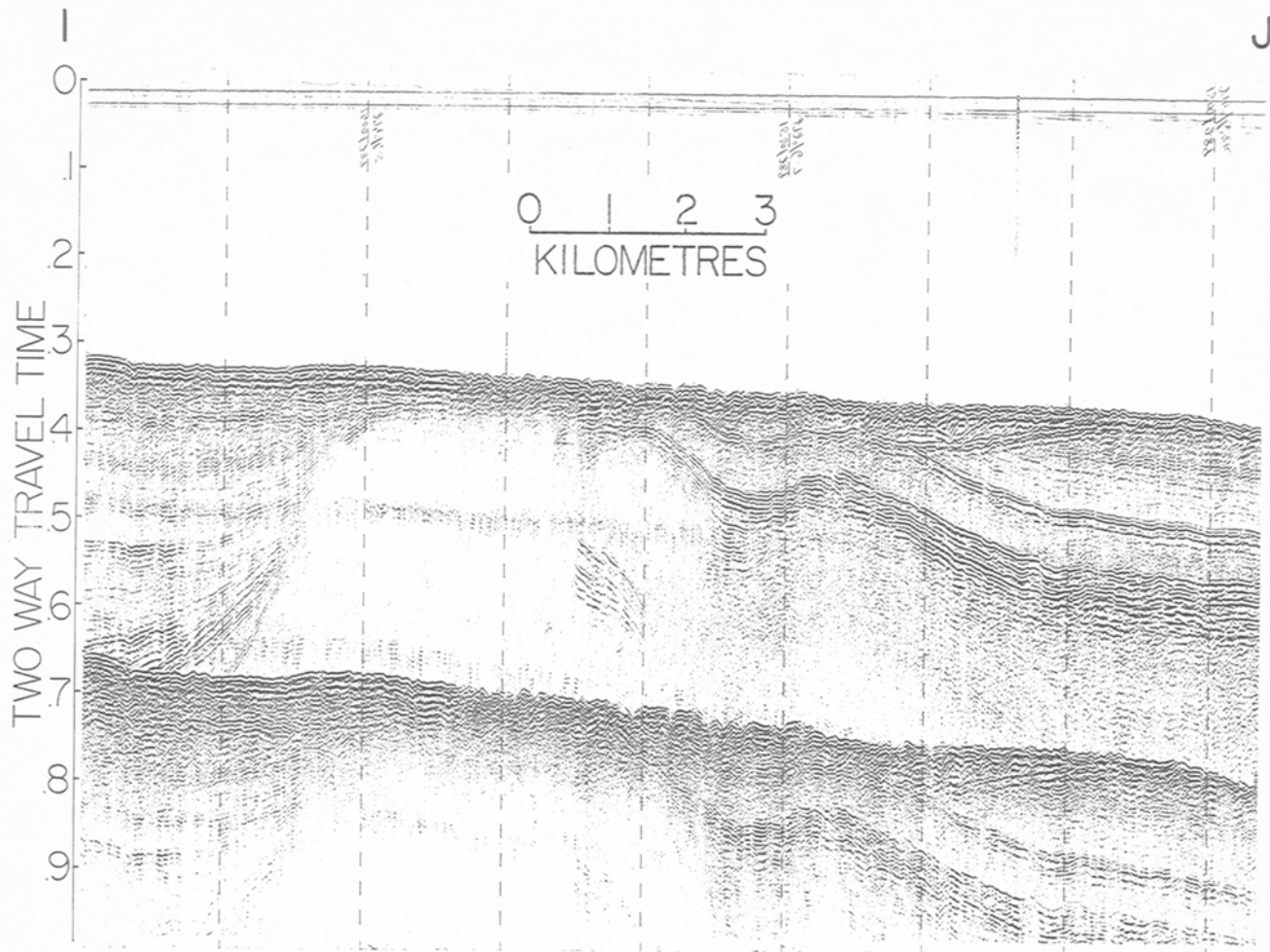
Two seismic refraction profiles run in 1980 across this ridge structure yielded velocities in the range of 2.5 kms<sup>-1</sup> and 6.1 kms<sup>-1</sup>. These velocities seem appropriate to represent the sedimentary material in the core of the diapir, and the underlying basement rocks, respectively.

By the end of the 1980 season a series of geophysical profiles spaced at 9.3 km intervals will have been run across the Cumberland Sound offshore area between 64°20'N and 65°00'N. The occurrence of additional ridge structures is indicated.

The presence of petroliferous material and gas in these structures as suggested by our core sample together with the possibilities for entrapment on the flanks indicates that structures of this type may be of resource significance in this area.



**Figure 1.** Regional geological map showing locations of the core site and structure off Cumberland Sound.



**Figure 2.** Profile I-J (see Fig. 1 for location). Seismic reflection record across a diapiric ridge structure east of Cumberland Sound.

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#### Reference

- MacLean, B., and Falconer, R.K.H.  
 1979: Geological/geophysical studies in Baffin Bay and Scott Inlet-Buchan Gulf and Cape Dyer-Cumberland Sound areas of the Baffin Island shelf; in *Current Research, Part B*, Geological Survey of Canada, Paper 79-1B, p. 231-244.