

Science Report

GEOLOGY

Hope for Shetland oilfield

By Nature-Times News Service

Geophysical surveys west of Orkney and Shetland have suggested the possibility that oil-bearing strata of sedimentary rocks may be found there. The survey is described in the latest issue of Nature by Dr. M. H. P. Bott and Dr. A. B. Watts, of Durham University. Their conclusions are based on measurements taken during cruises of the research vessel John Murray in 1967 and 1968.

As with previous explorations for oil, the survey has been based on simultaneous measurements of the strength of the magnetic forces at the surface and of the variations of the downward pull of gravity from one place to another. In general, the strength of the downward pull of gravity increases steadily to the north-west, as the continental crust becomes thinner towards the edge of the continental shelf. So much is expected.

One of the most striking features of the survey is a long tract of territory running for 150 miles north-north-east from a point about 40 miles north of Orkney in which the downward pull of gravity is consistently higher than elsewhere. Although this phenomenon might be accounted for by a thinning of the crust beneath this region, which is about 20 miles across, Dr. Bott and Dr. Watts consider that the most likely explanation is a belt of igneous rocks with high density emplaced in the sea bed.

This geological feature is sur-

rounded by a number of places where the downward pull of gravity is abnormally small and the most likely interpretation of this is that the ridge of igneous rocks juts up through layers of less dense sedimentary rocks.

The most striking feature of the gravity maps is the rapidity with which a gravitational high gives way to a gravitational low, and this in turn leads to the suggestion that the beds of sedimentary rock responsible for the latter are exceedingly thick. In one place, roughly 60°N, 3°W, the sedimentary rocks may be anything between three and five miles thick.

The reasons for the occurrence of this geological pattern off Orkney and Shetland are not easy to describe. Dr. Bott and Dr. Watts are among other things concerned to link this submarine pattern with the fault systems recognized on the mainland of Scotland. They conclude that the Great Glen Fault,

in the past sometimes assumed to pass to the west of Shetland has no influence on what happens in the region they have explored.

The practical importance of their work is summed up in what they have to say about the chance of finding oil and gas in these structures.

"Deep sedimentary basins can give the environment for source rock and reservoir rock in which economic quantities of oil and natural gas may be found. We anticipate that the newly discovered basins of the Hebridean-Shetland shelf may in future receive the detailed geological investigations now in progress in the North Sea and Irish Sea."

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