In these days when most earth scientists are getting involved in understanding the nature of the deep continental crust and of the earth's interior, the unbelievable accomplishment of drilling a deep hole to a depth of nearly 12 km must be ranked as a notable achievement. The Kola Superdeep Well is located in the northeastern part of the Baltic shield. Drilling was started in 1970 and is still being continued. The hole was drilled with the primary objective of penetrating the full thickness of the Proterozoic cover and a good part of the Archaean basement forming the lower crust. It was also the expectation that such a deep hole would bring to light hidden mineral resources. The principal result gathered from this stupendous exercise are detailed in this book under three main sections—Geology, Geophysics and Drilling.

The section on Geology starts with a description of the northeastern part of the Baltic shield. Deep seismic investigation suggested a four layer crust consisting of (1) basaltic granulite layer, (2) a dioritic layer, (3) granite-metamorphic layer, and (4) sedimentary cover. Data obtained from the superdeep hole does not conform to this picture. Proterozoic cover rocks are seen to extend to a depth of as much as 6.8 km and give place to the Kola series of Archaean, a complex of granites and gneisses with intercalated amphibolites. The hole, we understand, is still passing through a layer of migmatitic plagioclase gneiss and has not crossed over to basic granulites even at a depth of 11.6 km. The absence of the oceanic crust is the most surprising part of the drilling result.

One of the objects of the deep hole was to find out whether there were prospects of encountering ore deposits at depth, whether vertical zonation would exist and whether hydrothermal mineralization would persist at increasing depths.

No major ore-bearing horizons appear to have been encountered excepting copper-nickel sulphide associated with ultramafics within the Proterozoic cover rocks. It is claimed that fluid permeable zones controlling ore formation process exist in Archaean rocks at depths of 9500 and 10,500 m. No convincing evidence of a biogenic origin of hydrocarbon in the Proterozoic and Archaean rocks have come to light in the well.

The second section—Geophysics (p. 315-413) deals with technical conditions of logging, seismic investigation in the bore hole, velocity characteristics, electric and magnetic properties, radioactivity, thermal properties, etc. Temperature measurements indicate a temperature gradient of 1.6°C/100 m in the Proterozoic and 2°C/100 m in the Archaean complex. The third section (p. 423-521) deals with different technical aspects of drilling.

Considering the time, labour and money spent on this great Superdeep Hole, information of positive value, it should be admitted, is not much. This does not in any way meant to belittle the great technological achievement in penetrating so deep into the earth's crust. Many more holes will have to be drilled before we can expect to get a clear picture of the complex character of the continental crust.

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