Surface Sediments on the Grand Banks of Newfoundland: a Progress Report*

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To date the texture and mineralogy of 128 surface sediment samples from the Grand Banks southeast of Newfoundland have been studied. The samples are distributed irregularly over an area between 43° and 46°30'N and between 49° and 55°30'W. All the samples were taken at depths of up to 260 metres (142 fathoms), with most being taken in the range 65-95 metres (35-52 fathoms). Large and small-size Van Veen-type grab samplers were used to collect the samples. In the laboratory all the samples were analyzed for particle-size distribution using the standard sieve method and, where necessary, the pipette method. The heavy minerals of most of the samples have been studied and a start has been made on studying the light minerals.

All but 6 of the samples contain 90% or more of sand-size or larger (>0.063 mm diameter) material. The other 6 have from 14% to 72% of silt- and clay-size material (<0.063 mm diameter). Samples composed of predominantly (>80%) gravel-size material (>2 mm diameter) occur almost exclusively in the northern and northeastern part of the study area. Separating the gravel area into 2 smaller patches are relatively thin bands of mixed gravel and sand and one sinuous belt of predominantly (>90%) sand-size material. The sand belt appears to occupy a topographic depression averaging nearly 10 metres (5½ fathoms) lower than the flanking, mixed sand and gravel areas. The bulk of the remainder of the study area is covered with predominantly sand-size material with occasional patches of gravel and sand or a sand-silt-clay mixture. A plot of percent sand-size material in each sample against water depth shows there is >90% sand at depths of 60-64 metres (about 34 fathoms) and 115-119 metres (about 64 fathoms).

The transparent heavy-mineral suite in the samples is dominated by garnet (several species), hornblende, pyroxene (several species) and zircon. Of these, garnet is the most generally abundant mineral and masks what appear to be significant variations in the other three. However, after garnet has been eliminated from the data, the others considered on their own, and the resulting data plotted, the area can be divided into 4 definite "provinces" dominated by one or other of the three minerals. The northern portion of the study area is dominated by pyroxene, while a long, relatively thin strip, its seaward edge approximately coincident with the 100-metre contour, is dominated by hornblende. The remainder of the area is zircon-dominated. There is no obvious correlation between these areas as defined by the abundance of various heavy minerals and either bottom topography or sediment texture. However when the percentages of hornblende, pyroxene and zircon in each sample are plotted against water depth, it can be seen that there are distinct concentrations of each mineral at different depths. Hornblende has two

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