Also indicated from the frequency data are the following:

1. Compositional variation with any one exposed face, although limited, occurs unpredictably both vertically and laterally;

2. Factors that contribute to unpredictable within-site variation are thought to be (a) random counting error; (b) the sorting effect of selective transportation which results from variation in pebble shape and rock density; and (c) selective comminution of less resistant pebbles;

3. Comparison of subsamples collected from the same bed indicate that considerable variation is possible within the same bed over as little as two metres laterally;

4. To minimize the effect of unpredictable variation at any site, it is desirable to use a composite sample composed of subsamples from different facies and separated spatially by at least a few metres; and

5. Because of unpredictable variation in frequencies, a conservative smooth "working" curve that diminishes the amplitude of anomalies should be drawn through the actual frequency data.

A minimum of 100 pebbles per sample and a maximum spacing of one kilometre between samples are recommended for a reconnaissance sampling program where the objective is a better knowledge of underlying bedrock types and their distribution. This should be followed up by larger, more closely spaced samples for more detailed information at more promising localities. Where the objective is the discovery of rare particular pebbles, the sample size should be several hundred pebbles at each site.

Factors that result in reproducible anomalies along the esker trend include bedrock variation, the esker stream locally having eroded subjacent till or crossed lithologic trains in the till, and incorporation into the main esker of sediment from a tributary esker carrying a compositionally different load.


116. TRACE ELEMENT AND MINERAL INDICATOR TRACING - KAMINAK LAKE, DISTRICT OF KEEWATIN

An esker and till sampling program was initiated in the Kaminak Lake-Quartzite Lake-Carr Lake region of eastern Keewatin, Northwest Territories. Samples of glacial till, marine sediments, and esker sediments were collected on predetermined grids and will be analyzed to determine the dispersal patterns caused by glacier transport of mineral and rock fragments and trace elements from their source areas.

Most sampling was accomplished by helicopter (Bell 47G2) traverses from a fixed base camp. The traversing technique employed allowed up to 45 samples from 50 cm to 75 cm deep pits to be taken per day.

Till sampling was complicated by the presence of two distinct till units which are present in section but are not always recognizable in sample pits. The older till unit is sandy, compact, and grey; the younger is very clayey and maroon to red-orange. In section, the two facies can be seen to
be intersheared with 0.5 m to 1.0 m thick thrust plates of grey till alternating with similar thicknesses of red till. In sample pits in frost boils (the till sampling medium) distinct, disoriented fragments of either facies occur embedded in a matrix of the other facies. Where possible, samples of both facies were taken from a single sample point.

Sand samples from depths below 40 cm were collected at 0.32 km intervals along a 30 km segment of the Copperneedle River esker and at similar depths at 0.15 km intervals along a 25 km segment of the Kaminak Lake esker. The mineralogical and trace element composition of heavy minerals from these samples will be studied in detail.
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