DESCRIPTIVE NOTES
Map 39-1965: Molybdenum content of stream and spring sediments

Geological

South of a line following the Millstream River and westward through Tetagouche Lakes, the area is underlain mainly by the Ordovician Tetagouche Group comprising a series of complexly folded and sheared metasediments, metavolcanics, and metabasic intrusives. These are intruded south of Bathurst by a granitic mass.

North of the Millstream River the rocks are mainly of Ordovician, Silurian, and Devonian age. The Elmtree Group, of probable Ordovician age, is composed of metasediments and some metavolcanics which are intruded by a granitic stock in the vicinity of Antinouri Lake. The Silurian and Devonian rocks comprise both sediments and volcanics that are faulted in places, gently folded, and on the whole are less metamorphosed than the older rocks in the district. In the Nicholas Dénys area the Silurian rocks are intruded by a granitic stock that has an associated metamorphic aureole in which the rocks are mainly hornfels and skarn. Another granitic stock intrudes Silurian volcanic rocks along South Benjamin River.

East of Nepisiguit River the area is underlain by the Pennsylvanian Bathurst Formation. These rocks are mainly siltstones, sandstones, grits, and conglomerates that dip gently eastward.

Flat lying conglomerates and sandstones (Bonaventure Formation), possibly of Triassic age, underlie Heron Island and fringe the coast in the Jacquet River area.

Glacial till, sand, and gravel mantle the whole district, and Recent post-glacial sands and clays cover much of the area around Bathurst Harbour and occur in the shore section at Jacquet River.

The principal mineral deposits in the area are massive, vein, and disseminated deposits containing essentially iron, zinc, lead, and copper sulphides. Molybdenite occurrences are associated with the Bathurst, Nicholas Dénys, and Antinouri Lake granitic bodies.

The text of the paper accompanying this map should be consulted for further details on the geology and economic geology of the district.

Geochemical

The analyses recorded on this map were done on samples of sediment collected from the channels of rivers and streams and from rivulets flowing from springs. Where possible the active channels were sampled, but in a few cases the residual sediment of dried-up streams was used. In muskeg areas and in streams where beaver workings are present the sediment contained abundant decomposed organic matter.

The sediment was dried, sieved to -80 mesh, ground to -150 mesh, and analyzed for molybdenum by the dithiol method outlined by North (1956)[1]. The values are expressed in parts per million. The subdivisions used on the map are arbitrary and based on experience in the district. The lowest subdivision can be taken to represent the background.

All streams and rivers were traversed on foot, and the stream sediments were collected, where possible, at intervals of 1,500 feet.

The molybdenum content of the stream sediments ranges from less than 1 to 260 ppm. The background for the whole district is 2 ppm, but in some areas the background is less than 1 ppm. This indicates that each stream or group of streams should be treated individually.

Only the skarn-type sulphide deposits in the district are marked by higher than normal contents of molybdenum in the neighbouring stream sediments. These include the deposits associated with the Nicholas Dénys granitic stock.

Many of the streams draining the areas underlain by granitic stocks and batholiths and their associated metamorphic aureoles contain above normal amounts of molybdenum in the stream sediments. The streams of interest are the easterly north-draining tributaries of Little and Middle Rivers and Roughwater and Sugary Brooks, all draining the area underlain by the Bathurst granite; Stephens Brook and a number of other streams to the west draining the area underlain by the Nicholas Dénys granitic body and its thermal aureole; the Elmtree River system, Ellis Brook, and the Belledune River system, draining the area underlain by the Antinouri Lake granitic mass and its contact aureole; and the Benjamin River and some of its tributaries draining the general area underlain by the Benjamin River granitic body. Numerous other scattered anomalies occur throughout the district. Many of these appear to be associated with highly manganiferous sediments.

There is no general correlation of the molybdenum contents of the sediments with any of the other elements except tungsten and manganese. Highly manganiferous sediments tend to be enriched in molybdenum, as well as in Pb, Zn, Cu, As, Sb, and Co. In certain areas tungsten correlates with molybdenum; in other areas this is not the case.

The presence of abundant manganese hydroxides and oxides (Map 44-1965) may be a factor in the localization of molybdenum in some of the anomalous streams. Manganese hydroxides (and oxides) adsorb and/or coprecipitate molybdenum and hence may give false anomalies. This feature should be carefully considered when evaluating all anomalies on the map.

The molybdenum contents of the stream and spring sediments shown on this map should be compared with those for heavy metals in water on Map 32-1965, and also with the contents of individual elements in stream sediments on Maps 34-1965 to 44-1965 inclusive.

[1]North, A. A. : Geochemical field methods for the determination of tungsten and molybdenum in soils; Analyst, vol. 81, pp. 660-668 (1956).