volcanics and volcanic derived rocks that closely resemble the strata of the Phelan Creek formation. These modern volcanic islands are mostly inactive and have subsided. Thick limestone-black shale caps are now being formed on top of the subsiding volcanic platforms. The resulting stratigraphic succession is nearly identical with the stratigraphic sequence that characterizes upper Paleozoic deposits throughout the eastern Alaska Range.


ORDOVICIAN OF SOVIET ARCTIC

Ordovician deposits are widely represented within the Soviet Arctic. They are known in Novaya Zemlya, Vaygach Island, Pay-Khay, Severnaya Zemlya, northern Siberian platform, New Siberian Islands, and northeastern USSR. In the western Arctic (Polar Urals-Novaya Zemlya) Ordovician deposits formed the base of the Caledonian-Hercynian cycle, and consist of a very thick variable complex of clastic and carbonate rocks.

In the central Soviet Arctic, the Ordovician is at the base of the stratigraphic column in Severnaya Zemlya, whereas on Taimyr Peninsula and the Siberian platform, it comprises a single depositional cycle with the Cambrian. The Ordovician in the region is represented by predominantly carbonate rocks reaching a thickness of 2,000 m in depressions; in the northern part of the Taimyr Peninsula it consists of graphelite-bearing clastic and carbonate rocks up to 1,000 m thick. The Ordovician of Severnaya Zemlya is represented by variegated clastic and carbonate rocks about 2,000 m thick.

Within the eastern Arctic, Ordovician deposits are a part of the fold fringe of the Kolyma massif and of the Mesozoids of northeastern Chukotsk Peninsula. Ordovician strata in the northeastern USSR consist of carbonate, clastic and carbonate, and wholly terrigenous clastic sequences. The relations with underlying rocks are uncertain there. Ordovician rock thicknesses differ markedly from place to place and reach 5,500 m in some places.

Ordovician deposits have been studied in more detail in southern Novaya Zemlya, Vaygach Island, northern Pay-Khay, central Taimyr, in the Norilsk district, and within the limits of the folded margin of the Kolyma massif. The Ordovician of northern Novaya Zemlya, Severnaya Zemlya, and the New Siberian Islands is less well known.

However, even where Ordovician sections have been investigated comprehensively and are richly fossiliferous, the Lower-Middle Ordovician and Ordovician-Silurian boundaries are uncertain because of geologic peculiarities of the region. There is no definite solution to the Cambrian-Ordovician boundary problem. Variable sedimentary facies and diverse zoogeographic provinces make regional and interregional correlations difficult.

Nevertheless, recognition of transitional sequences in fold areas of the Soviet Arctic and the wide interregional distribution of some faunal elements during climaxes of marine transgression (late Tremadocian and middle Caradocian) permit rather definite correlations for the solution of practical biostratigraphic problems and correlation with standard sequences elsewhere.

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GEOL O GIC STRUCTURE AND HISTORY OF POLAR URALS, PAY-KHOY, NOVAYA ZEMLYA, AND NORTHERN PECHORA DEPRESSION

1. The late Paleozoic-early Mesozoic fold system of the Urals-Novaya Zemlya and the Paleozoic-Cenozoic strata of the Pechora depression formed on a folded basement.

2. Structures within the fold system may be divided into (a) the Polar Urals and Pay-Khay anticlinorium and (b) the structures of Novaya Zemlya. In the land part of the Urals system, a set of foredeep basins is recognized at the junction of the fold system and the depression on the western sides.

3. The Urals-Novaya Zemlya fold system includes a complex of Precambrian, Paleozoic, and early Mesozoic (within a foredeep) sedimentary and volcanic rocks. The Precambrian thickness exceeds 3,000 m, and that of the Paleozoic, 10,000 m.

4. The Paleozoic (Ordovician and younger strata) transgressively and unconformably overlies the older formations. Important hiatuses in the Paleozoic are established in pre-Late Devonian (Novaya Zemlya), and in the Late Carboniferous (Pay-Khay, Novaya Zemlya).

5. Volcanic strata of predominantly basic composition occupy much of the Precambrian (Polar Urals, Novaya Zemlya, Pay-Khay) and Late Devonian sections. Volcanic rocks of late Paleozoic and early Mesozoic ages are found in northeastern Pay-Khay.

An ancient pre-Ordovician and partly pre-Silurian ultrabasic to acid intrusive complex (Polar Urals, Pay-Khay, Novaya Zemlya), a Caledonian (Silurian-Devonian) complex of ultrabasic, basic, and acid intrusions (Polar Urals and Novaya Zemlya), and Hercynian basic and acid intrusions (Novaya Zemlya, Polar Urals) are present in this area.

Within the fold system the following structural elements are clearly distinguished: (a) the Polar Urals with an adjacent foredeep of the Urals type; and the Pay-Khay anticlinorium, an early Mesozoic structure; the strike of which is the same as that of the Baikaldides and Novaya Zemlya. The Pay-Khay and Novaya Zemlya areas thus have characteristics of both the Urals geosyncline proper and of the Scotland-Scandinavia Grampian geosyncline joining the Novaya Zemlya trough on the west.

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ORIGIN OF MANGANESE-RICH LAYERS IN ARCTIC SEDIMENTS

A sediment core from the Wrangel abyssal plain (T3 69-12, lat. 80021.9'N, long. 173°33'W, water depth: 2,867 m; core length: 374 cm) was analyzed for CaCO3, Mn, P2O5, Al, Fe, and trace elements; in total, 15 samples from the interval 0–350 cm were used for these analyses. Three carbonate layers were found (5–16% CaCO3), interspaced by carbonate-free strata (0–2% CaCO3), resembling the intercalations described by Herman in other Arctic cores.

The carbonate-free fractions of the carbonate layers show higher contents of Mn (0.4–0.9%) and P2O5 (0.215–0.237%) than the carbonate-poor layers in which the corresponding values range between 0.15–0.25% and 0.183–0.211%. The Al and Fe values show no major variations, ranging between 7.5–9.9 and 4.3–