

The Geology of Varanger Peninsula and Stratigraphic Correlation with Spitsbergen and North-East Greenland

STANISLAW SIEDLECKI

Siedlecki, S. 1975: The geology of Varanger peninsula and stratigraphic correlation with Spitsbergen and north-east Greenland. *Norges geol. Unders.* 316, 349-350.

S. Siedlecki, *Norges geologiske undersøkelse, P.O.Box 3006, N-7001, Trondheim, Norway*

Based on a study of the various sedimentary successions observed in Varanger peninsula as well as on the suggested correlations between particular units of the three large groups of sedimentary and metasedimentary rocks, the Barents Sea, Raggo and Laksefjord Groups, it is now possible to reconstruct the history and sequence of Late Precambrian sedimentation, not only on Varanger Peninsula, but also in other areas outside the northern margin of the Fennoscandian Shield. It has also enabled Dr. Anna Siedlecka (1973) to introduce a new lithostratigraphic term, the 'Øst-Finnmark Supergroup', which embraces the above-mentioned three groups as well as the younger but still pre-tillitic Tanafjord Group.

A lithostratigraphical equivalent of the Øst-Finnmark Supergroup, deposited in approximately the same basin but later separated by continental drift, is the 'Eleonore Bay Group' of East and North-east Greenland. The Late Precambrian Hecla Hoek Sequence on Spitsbergen, and especially the 'Middle Hecla Hoek', fully developed in eastern New Friesland on Spitsbergen, may also be equivalent in age to the sequences constituting the Øst-Finnmark Supergroup.

Lithostratigraphical correlation between the Øst-Finnmark Supergroup and the equivalent series on Greenland and Spitsbergen is possible only on a large and very approximate scale. The only satisfactory horizon for a chronostratigraphic correlation in the unfossiliferous series below the Cambrian is presented by the tillites. There is no doubt that they represent one major ice age (the Varangian Ice Age of Kulling and Harland) for at least this entire northern region.

Below the tillites one finds several thousand metres thick sequences of sediments with a quite characteristic unit of carbonate rocks, often rich in stromatolite-structures. This is represented by the Grasdalen Formation and Porsanger Dolomite in East Finnmark, the Akademikerbreen Group in Spitsbergen and the Nøkkelfossen Formation in East Greenland. It should be emphasised, however, that the carbonate units of Spitsbergen and Greenland are several times thicker than the Grasdalen Formation, and it seems likely that they may be equivalent not only to the uppermost part of our Tanafjord

Group, but also that they represent a carbonate facies of the entire Tanafjord Group and of the upper part of our Barents Sea Group. The last two groups (the Barents Sea and Tanafjord Groups) were deposited relatively close to the Fennoscandian Shield, which was an important source area for almost all the terrigenous sediments of Varanger Peninsula.

In the lower parts of the Eleonore Bay Group on Greenland and in the lower part of the Middle Hecla Hoek on Spitsbergen, terrigenous psammitic and pelitic sediments are present. These can be very broadly correlated with the lower parts of the Øst-Finnmark Supergroup. The 'multicoloured' and carbonate-bearing Brogetdal Formation (within the Eleonore Bay Group) can probably be correlated with the Båtsfjord Formation on Varanger Peninsula. As mentioned above, the Båtsfjord Formation is also 'multicoloured' and carbonate-bearing.

Although a more precise correlation of minor lithostratigraphic units still requires further investigation, an important conclusion resulting from the work on Varanger Peninsula is that thick sequences of Late Precambrian sedimentary rocks represent an important element in the 'post-Archean' geology of the North Atlantic continental margin. The Late Precambrian in all probability underlies all the younger sequences in the vast areas of the Barents Sea, and the shelf-margins of Greenland and Svalbard. The detailed mapping of Varanger Peninsula began too recently for this area to be recognized as 'classical' for the Late Precambrian, yet many aspects of the Late Precambrian geology are better seen in Varanger Peninsula than in more familiar or established late Precambrian areas in other parts of Europe.

REFERENCE

- Siedlecka, A. 1973: The Late Precambrian Øst-Finnmark Supergroup – a new lithostratigraphic unit of high rank. *Norges geol. Unders.* 289, 55–60.