

FIELD INVESTIGATIONS IN THE KETILIDIAN ROCKS OF THE NANORTALIK – TASERMIUT REGION

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Before finishing the compilation of the Nanortalik sheet it had become necessary to check several things. Because of bad ice conditions during the summers of 1968 and 1969 it was only possible to visit the area between Tasermiut fjord and the north-western boundary of the Ketilidian sedimentary basin with the old reactivated basement in this part of Greenland, situated along Søndre Sermilik fjord and across the north-westernmost part of Sermersôq.

The presence of important, but discontinuous, amphibolite horizons of probable volcanic origin between the pelitic to semipelitic gneisses and the quartzites along Tasermiut fjord and Søndre Sermilik fjord suggests that there are probably basic volcanic rocks at at least two different levels in the Ketilidian supracrustal pile and not only at the top (see fig. 4). From bottom to top the succession thus becomes: pelitic to semipelitic gneisses – volcanics – feldspathic quartzites – volcanics.

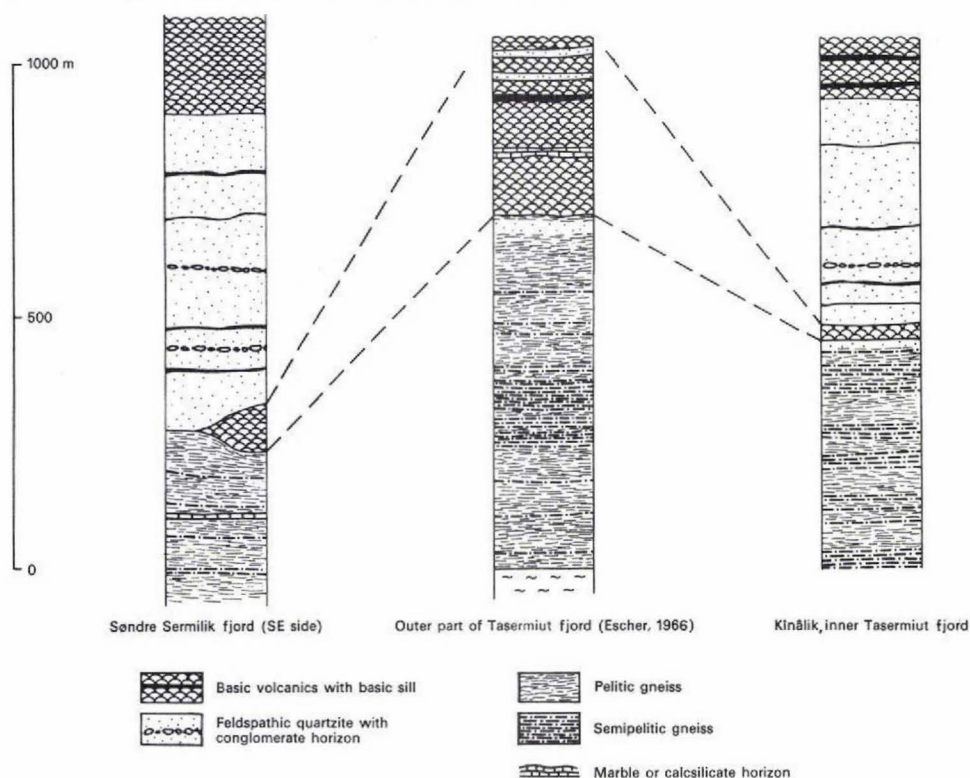


Fig. 4. Schematic columnar sections of the Ketilidian supracrustal rocks and gneisses between Tasermiut fjord and Søndre Sermilik fjord.

The pelitic components of the pelitic to semipelitic gneisses, which comprise the lowest part of the stratigraphical column north of Tasermiut, are throughout their whole thickness characterised by the paragenesis biotite-cordierite-microcline-plagioclase-quartz. Only close to the north-western boundary of the area of pelitic to semipelitic gneiss does andalusite occur in several places. The andalusite is thought to be the result of regional metamorphism and not of contact metamorphism by the nearby rapakivi granites. Close to the north-western margin of the Ketilidian sedimentary basin the sedimentary pile probably thinned out so that the andalusite isograd could come down to the present level of exposure in that area. In other places more to the south-east there are no clear indications of a decrease in metamorphism.

The bottom of the Ketilidian sedimentary basin has been observed at two and perhaps even three localities – two along the Tasermiut fjord and the third on Nanortalik island. The basement appears to have been mobilised to a considerable degree during the Ketilidian plutonic episode. The main occurrence is the anticlinal core granite described by Escher (1966) as synkinematic granodiorite. In this granodiorite body a great number of double folded bands of homogeneous amphibolite occur. These are interpreted as dykes which have intruded a pre-Ketilidian basement which was afterwards remobilised during the main Ketilidian plutonic episode and emplaced as an anticlinal core. During this process the previous dykes were double-folded (early isoclinal folds about NE axes and later open folds about NW axes) and locally boudinaged, but the surrounding granodiorite did not reach the state of attacking and granitising the amphibolite bodies.

The degree of migmatitisation in the pelitic to semipelitic gneiss series is very variable. There is no real migmatite front which ascended from the depth into the supracrustal series. The migmatitisation is confined to various levels above and below which the degree of migmatitisation usually is small or nil. However, in the unmigmatized or weakly migmatized areas the rocks are always feldspathic as a result of the high-grade metamorphism. In the most strongly migmatized parts the neosome, which is usually pegmatitic, can make up 60 to 70% of the volume of the rock. The lowest metavolcanics in the sedimentary pile contain a great amount of pegmatites. Most of them are apparently undeformed, but some are folded. In the lower part of the quartzite series there is considerable migmatitisation in many places to the north-east of the inner part of Tasermiut fjord. The migmatizing pegmatites have been formed over a considerable span of time (Escher, 1966). The oldest pegmatites are strongly folded. Most of the pegmatites occur as sills.

Reference

- Escher, A. 1966: The deformation and granitisation of Ketilidian rocks in the Nanortalik area, S. Greenland. *Bull. Grønlands geol. Unders.* **59** (also *Meddr Grønland* **172**, 9).