RESEARCH ON THE HIGH-METAMORPHIC COMPLEXES OF THE AGTO AREA

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Mapping in the Agto area was continued in 1968, the third season of new research. The work has been subsidized by the Carlsberg Foundation and it forms part of the Survey's mapping programme and the results will appear in a Survey 1 : 100 000 sheet. In 1968 mapping was carried out in eight individual areas. The mapping is now so far advanced that an area bounded by 68° N and a line roughly from the interior of Ataneq fjord to the head of Nordre Strømfjord is known in some detail based on 1 : 20 000 field maps.

The rocks of the area are largely migmatitic gneisses and amphibolites in granulite facies and amphibolite facies. Vast areas are composed of agmatitic gneisses. In addition there are metasediments - marbles, garnet-mica schists, sillimanite gneisses, graphite schists, granulites s. s. and quartzites - as well as amphibolites. These metasediments and amphibolites form an upper structural unit always occurring synformally. Homogeneous foliated granitic rocks also occur, especially in the western part of the area.

The regional structural pattern is to a varying degree controlled by ENE- to NE-trending fold axes and steeply NW-dipping axial planes. In the southern part of the area and especially in the region between Gieseckes Sø and Nordre Strømfjord these structures dominate. In the northern part of the area more open structures of this trend interfere with an older structural pattern involving larger structures with N-S-trending almost vertical axial planes. In the northernmost part of the area N-S structures appear to be bent into ENE-trending structures.

It is regarded as important that only the ENE pattern contains the metasediments with marbles and graphite schists, and the thick amphibolites. This pattern is parallel to the general trend of the Nagssugtoqidian fold belt.

Another important feature is that rectilinear, faulted but not folded dykes of N-S and E-W trend and metamorphosed under granulite facies

conditions only occur in regions of N-S- or nearly N-S-trending structures. Approaching ENE-trending structures the dykes are disrupted and folded. Unfortunately the dykes are very few in number.

It is at the moment tempting to place the metadykes in a period of crustal consolidation which possibly was interorogenic. The structural history of the area, as revealed from local chronological studies by the different members of the team, then implies at least three early fold phases prior to the dyke intrusion and three fold phases post dyke intrusion. The last fold phase gave rise to open structures with NW-trending axial planes. The latest events are faulting and crushing. One prominent direction is NNE. The displacement is generally less than 100 m.

Throughout the area continuous bands of marble occur between migmatized quartzo-feldspathic gneisses and less migmatized metasedimentary gneisses belonging to the upper structural unit. In four major structures the marbles are found structurally below granulite facies migmatites with the succeeding metasediments still lower. In three major structures the marble occurs above migmatites and below the succeeding metasediments. In all cases the same general lithologic succession relative to the marble occurs, and in all cases there is an apparent conformity between the migmatites and the marbles, although considerable structural disharmony can be detected. The field relations around the marbles suggest that the contacts with the more strongly migmatized gneisses are boundaries of major importance, either thrust contacts established earlier than the ENE fold phase or an original basal unconformity, inverted in places (maybe in an early fold phase or in the ENE fold phase), and downfolded by the ENE folding in long synformal structures.