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Jane Herdman Laboratories of Geology,
University of Liverpool,
Brownlow Street,
Liverpool L69 3BX,
U. K.

NAGSSUGTOQIDIAN SUPRACRUSTAL METAVOLCANIC ROCKS OF SARFARTÛP NUNÂ, SØNDRE STRØMFJORD, CENTRAL WEST GREENLAND

John Diggens and Christopher Talbot

The area discussed here is situated 8 km north of the Sukkertoppen Iskappe and 10 km east of Søndre Strømfjord at 66°27′N, 51°50′W. The work was undertaken during August as part of the programme led by Dr. J. Watterson (see this report).

The outcrop of supracrustal metavolcanic rocks is less than 15 km² in extent. They consist of greenschist to low amphibolite facies schists disposed in an east-west trending synformal basin and overlying Archaean gneisses modified by Nagssugtoquidian shearing. The south-eastern margin of the Nagssugtoqidian mobile belt is 15 km east of this area (Bridgwater *et al.,* 1973).

The succession

The supracrustal succession of Sarfartûp nunâ consists of layered sequences of actinolite schist, actinolite-chlorite schist, tremolite-calcite schist, chlorite-muscovite phyllite, and sills and dykes of garnet amphibolite. At or near the base of the succession, there is a large metamorphosed ultrabasic sill up to 200 m thick.

The succession is repeated by several low-angle thrust-faults, but a palinspastic construction gives an original approximate thickness of 300 m only. The actinolite schists crop out as lensoid bodies and show good relict pillow lava structures in places: they interfinger with actinolite-chlorite schists which frequently exhibit excellent pillow-lava breccia textures. The interbedded tremolite-calcite schists and chlorite-muscovite phyllites have occasional primary tuff textures and, although they are frequently less than 5 m thick, individual layers can be traced for greater distances along strike (often over 1 km) than lensoid pillow lavas and associated pillow-lava breccias.

The supracrustal rocks are cut by two generations of garnet amphibolite dykes. The earlier suite appears in part to be coeval with some of the metavolcanic horizons. In several localities, dykes of coarse-grained garnet amphibolite are seen to turn into sills (sometimes exhibiting primary igneous compositional banding) which in turn merge laterally into actinolite schists with pillow-lava structures.

The later suite of garnet amphibolite dykes have good chilled margins, though frequently sheared, and cut across all the supracrustal rocks and also the earlier suite of basic dykes and sills. The two suites of basic dykes are petrologically indistinguishable from each other in the field and closely resemble, in composition and texture, the Kangâmiut dykes in the surrounding basement acid gneisses of the Sarfartûp nunâ plateau.

It is hoped that geochemical and petrographic work now in progress will reveal petrological relationships between the metavolcanic rocks, the two suites of dykes and sills associated with them and the Kangâmiut dykes.

Structure

Structurally, the area appears to be a complex refolded klippe resting on a sole thrust and consisting of up to nine individual thrust slices of metavolcanic rocks. The klippe has been refolded with the underlying basement gneisses into an east-west trending synformal basin which forms an 'eye' of less-deformed rocks in a strongly deformed linear belt of Nagssugtoqidian shearing (see Bridgwater *et al.*, op. cit.). Pre-synform fold closures within the thrust slices of the klippe strongly suggest a derivation from the north for this supracrustal allochthon.

Mineralisation

There is very little evidence of mineralisation within the supracrustal succession. Quartz veins are locally abundant, particularly in the lower part of the klippe. The margins of several garnet amphibolite sills and dykes show localised staining with malachite. Three post-tectonic kimberlite dykes with an approximate east-west trend cut the succession.

Correlation

This is the first record of high-level structures to be reported from the Nagssugtoqidian mobile belt in West Greenland. From earlier reconnaissance work (J. Watterson pers. comm.) it appears that the Sarfartûp nunâ metavolcanic succession is the only occurrence of this type in the southern part of the Nagssugtoqidian on the west coast. The nature of the succession (basic, subaqueous, extrusive lavas and tuffs overlying ultrabasic rocks) is strongly reminiscent of similar occurrences of supracrustal rocks associated with highly deformed Archaean – Lower Proterozoic terrains elsewhere in the world, e.g. SW Greenland, S. Africa and NW Scotland. It is also similar to successions found in the lower parts of many Archaean greenstone belts.

Age

The age of formation of the metavolcanic rocks at Sarfartûp nunâ is still a matter for speculation. Whilst it is tempting to correlate with the generation of the Kangâmiut dyke magmas, the allochthonous nature of the outcrop makes direct field correlation difficult.

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J.D.,
Dept. of Geology,
Kingston Polytechnic,
Kingston-on-Thames,
Surrey,
U.K.

C.T.,
Dept. of Geology,
The University,
Dundee,
Scotland.

FIELD MAPPING ON THE EARLY PRECAMBRIAN ROCKS OF THE GODTHÅBSFJORD REGION, SOUTHERN WEST GREENLAND

David Bridgwater and V. R. McGregor

Mapping of the Precambrian rocks in the Godthåbsfjord region was continued in 1973 by R. Macdonald (Makerere University, see this report) and the present authors. A special study on the type and degree of deformation in the gneisses was begun by R. Hollingworth (Univ. of Liverpool). In June and July D. B. and