

THE GEOCHRONOLOGY OF THE SCORESBY SUNDBY AREA

Progress report 2: Rb/Sr mineral ages

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Introduction

The reconnaissance age determination programme started at the "Institute für Kristallographie und Petrographie" of the "Eidg. Technische Hochschule" in Zürich has been continued. To verify the pre-Caledonian ages found last year in the Stauning Alper, additional minerals were analysed from some of the previously dated rock samples. The results on these, and on a group of other samples, clearly confirm the presence of extensive Precambrian rock units within the Caledonian fold belt.

In table 6 the rocks are subdivided into four main groups on the basis of their geological relations.

Interpretation

The tentative interpretations put forward below were reached in cooperation with the GGU staff geologists and the field geologists who collected the material.

a. Homogeneous granitic rocks from the Stauning Alper

112015 Porphyritic biotite granite. The biotite age presented last year (Hansen & Steiger, 1971) is confirmed by the biotite/K-feldspar isochron. The geological relations indicate this granite to be coeval with rocks now giving ages around 600 m.y.. Therefore, the isochron age of 474 m.y. may reflect a Caledonian imprint on a pre-Caledonian intrusive rather than define the time of intrusion.

109365 Granodiorite. The previous biotite age (Hansen & Steiger, 1971) is also confirmed by the biotite/K-feldspar isochron. The isochron age (632 m.y.) probably does not represent an intrusive age, but may be due to partial updating of an older age. However, it is interesting to note that a K/Ar age of 616 m.y. was reported on a biotite from the Gåseland area (Larsen, 1969) and that the biotite from the aplite 111499 (this paper) shows a similar age.

Table 6. Preliminary Rb/Sr mineral ages

Location (latitude/longitude)	GGU No/Collector	Rock type	Mineral	Rb/Sr age x 10 ⁶ y
a) 71° 37' N/24° 57' W E Stauning Alper	112015/Steck	granite	biotite K-feldspar	} 474±5
71° 41' N/25° 45' W Borgbjerg Gletscher	109365/Keller	granodiorite	biotite K-feldspar	} 632±5
71° 38' N/24° 45' W Bjørnbo Gletscher	111499/Rutis- hauser	"sweat" pegmatite	} muscovite K-feldspar	738±20 382±15
"	"	aplite granite	biotite	616±10
b) 71° 29' N/25° 30' W S Stauning Alper	111955/Steck	cordierite granite	biotite	450±10
71° 39' N/24° 44' W Bjørnbo Gletscher	111534/Rutis- hauser	migmatite neosome	K-feldspar biotite	420±10
c) 70° 49' N/25° 36' W E Milne Land	135501/Higgins	granodiorite	biotite	1490±20
70° 51' N/25° 31' W E Milne Land	135585/Higgins	quartz syenite	biotite	1315±20
d) 71° 58' N/29° 10' W Charcot Land	103799/Henrik- sen	granite	muscovite	1620±50

111499 Aplite granite containing a "sweat" pegmatite. This sample originates from a dyke. Dykes of this type cut the massive granitic stocks and the migmatites in the Bjørnbo Gletscher region. The biotite age (616 m.y.) of the aplite granite is interpreted as an updating of an older age probably during Caledonian times when the "sweat" pegmatite was formed. Of the two ages obtained from the "sweat" pegmatite, the K-feldspar age (382 m.y.) is considered to be the more significant. The much higher concentration of common Sr in the K-feldspar makes it less susceptible than the muscovite to a possible influx of radiogenic Sr⁸⁷ from the aplite granite.

b. Migmatites

111955 Cordierite granite. This rock is representative of the migmatites which surround the homogeneous granite bodies in the southern part of the Stauning Alper. The migmatites in this area have in many places been mobile and all degrees of anatexis can be seen. The biotite age of 450 m.y. indicates either a synkinematic metamorphism or a partial or full updating.

111534 Migmatitic neosome with a quartz-bearing hornblende syenitic composition. The rock forms a part of the migmatitic surroundings to the "homogeneous

granites" of the Stauning Alper. The feldspar forms coarse-grained leucocratic layers, and the biotite originates from dark layers. The biotite/K-feldspar isochron points to a high initial Sr^{87}/Sr^{86} ratio (0.7487) confirming the multistage history of the rock. The age of 420 m.y. either dates the formation of the migmatite or the last significant metamorphic overprint.

c. Intrusive complex in eastern Milne Land

135501 Granodiorite. This intrusive is considered as the earliest of the suite of igneous bodies which cut the supracrustal sequence in the eastern Milne Land fault block. According to the thin sections it could be somewhat metamorphosed, but at this time the age (1490 m.y.) is seen as a minimum age for the intrusion.

135585 Quartz syenite. The body cuts the granodiorite (135501) and is clearly intrusive. The rock shows a slight deuteritic alteration of the feldspar but otherwise appears as very fresh. The age (1315 m.y.) is interpreted as a minimum age for the intrusion.

d. Charcot Land granite

103799 Granite. The granite of central Charcot Land is clearly intrusive, with a marginal zone of pegmatites that cut through the adjacent gneissic rocks of the Charcot Land basement. According to Steck (1971) this granite (which he calls a muscovite pegmatite mass) is younger than the Charcot Land supracrustal sequence and its major metamorphism. The muscovite age (1620 m.y.) confirms the old age of the Charcot Land supracrustal sequence (see Steiger & Henriksen, this report) and must be taken as a minimum age for the intrusion of the "Charcot Land granite" as partial updating cannot be excluded.

References

- Hansen, B. T. & Steiger, R. H. 1971: The geochronology of the Scoresby Sund area. Progress Report I: Rb/Sr mineral ages. *Rapp. Grønlands geol. Unders.* **37**, 55-57.
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- Steck, A. 1971: Kaledonische Metamorphose der praekambrischen Charcot Land Serie, Scoresby Sund, Ost-Grønland. *Bull. Grønlands geol. Unders.* **97** (also *Meddr Grønland* **192**, 3).