

AN OUTLINE OF THE GEOLOGY OF THE LYNGEN PENINSULA, TROMS, NORWAY

by
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The dominant feature of the Lyngen area is the central core of gabbro which extends the whole length of the peninsula (85 km). It is bounded by westerly dipping faults (thrusts) and has been extensively uralitized and saussuritised. The internal structures of the gabbro as indicated by layering is complex due to thrusting and folding.

Metamorphic rocks disposed on both sides of the gabbro have a general trend sub-parallel both to the gabbro outcrop and the fjords (Fig. 1). The rocks generally dip to the west and, since the dips are steep adjacent to the gabbro and gentle near the fjords, give an impression of a westerly facing monocline.

The sequence east of the gabbro is:

- 3) The Kjoslen Formation (Low amphibolite facies) is composed of medium-to fine-grained amphibolites (quartz-oligoclase-green hornblende-epidote). It outcrops east of and adjacent to the gabbro, and in part resembles sheared gabbro. Chemical evidence suggests an igneous parentage.
- 2) The Koppangen Formation (Greenschist facies) is composed of dark or grey phyllites, often graphitic (quartz-biotite- muscovite- pyrite). The biotite is of late development and garnet is rare.
- 1) The Lyngseidet Group (High amphibolite facies).

The main rock type of this group is a quartz-kyanite-garnet-biotite schist which is frequently feldspathised and may contain concretion pegmatites. The group is characterized by white meta-dolomitic limestone which frequently contains abundant diopside; other limestones may contain phlogopite, fosterite, tremolite, diopside and sphene.

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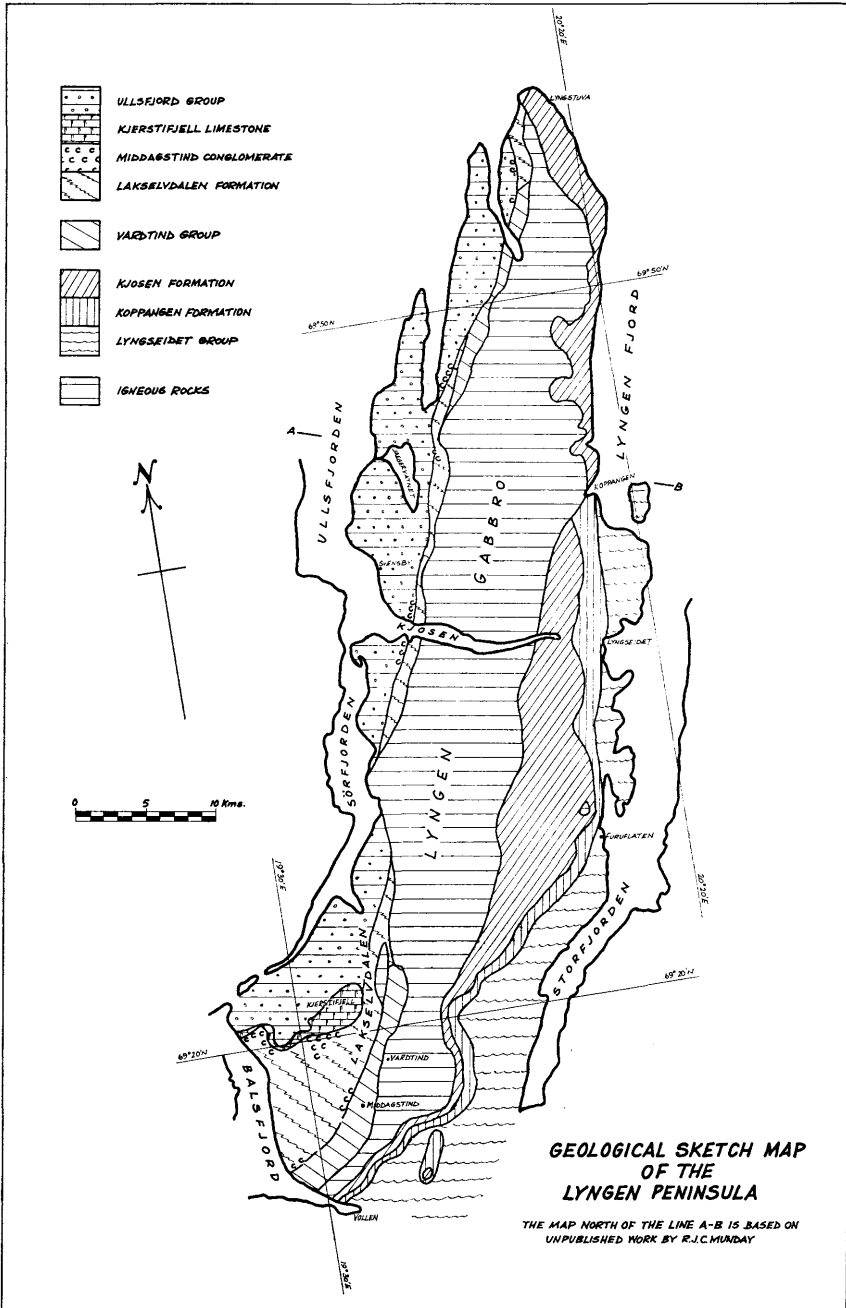


Fig. 1. Geological sketch map of the Lyngen peninsula.

Amphibolites occur largely as boudins. In the extreme south the lower part of the sequence is composed of quartz-oligoclase-mica-schists with some garnet.

In the north of the peninsula only the Kjosens Formation intervenes between the gabbro and Lyngenfjord.

The sequence west of the gabbro is:

- 8) The Ullsfjord Group contains two formations, a lower Jægervatnet Formation and an upper Svensby Formation.
 - (b) The Svensby Formation (Greenschist Facies) is formed of a uniform sequence of quartz-oligoclase-mica-schists, typically of a blue colour. In the north some horizons contain garnet. In the south this group seems to merge with the Jægervatnet Formation.
 - (a) The Jægervatnet Formation (Greenschist Facies) is a homogeneous sequence of pure white quartzite (without significant feldspar).
- 7) The Kjerstifjell Limestone (Greenschist Facies) is a massive fine-grained, blue, pure limestone which may contain traces of muscovite, pyrite and graphite. It is well developed only in the south and is absent or insignificantly exposed elsewhere.
- 6) The Middagstind Conglomerate (Greenschist Facies). This rock is of variable composition being composed of quartzite and limestone pebbles but either rock type may dominate even to the exclusion of the other.
- 5) The Lakselvdalen Formation (Greenschist Facies) is made up of alternations of impure sandy limestone beds and lustrous, silvery phyllites. This sequence is extensively developed in the south-west.
- 4) The Vardtind Group (Greenschist Facies) is found adjacent to the gabbro and has a faulted relation to the other rock groups. It is characteristically developed in the south where it is composed of green, chloritic phyllites which appear on chemical evidence to be of sedimentary origin. It contains a conglomerate essentially composed of altered basic igneous rocks. In the north a sequence of more gritty, feldspar-rich rocks (sometimes green) with a conglomerate and identical faulted relations appears in a similar situation.

The origin of the Kjosens Formation is uncertain especially as near the gabbro contact the rocks resemble sheared gabbro. However certain horizons are much richer in TiO_2 than is the Lyngen gabbro. Also a small altered gabbro mass (presumably of approximately the same age as the Lyngen gabbro) north-west of Furufalten has a metamorphic aureole developed within this formation.

The metamorphic rocks only display major folds in south Lyngen. To the

east of the gabbro, in the extreme south, a small syncline with a horizontal axis trends 015° . A NNE gently plunging antiform occurs to the west of Lakselvdalen, while Lakselvdalen itself is the site of a synform which is followed to the east by an overturned antiform cut off by a thrust forming the west boundary of the Vardtind Formation.

Three main fold episodes can be identified.

- F₁. Early recumbent folding has only been discerned as minor folding. Some evidence of it can be seen in most rock groups but it is dominant in the Lyngseidet Group where a north-west lineation is developed parallel to fold axes. Both kyanite and diopside are orientated parallel to the lineation, whilst an even earlier structure is indicated by inclusions in garnet.
- F₂. The second folding is visible as both major and minor folds and is responsible for the main distribution of the rock groups. The axial planes and cleavage have a consistent strike ($015 - 195^{\circ}$) but may vary markedly in dip. It is thought that the thrusting from the west which controls the boundaries of the Vardtind Formation, the gabbro, and to a large extent the internal structure of the gabbro, was associated with this deformation.
- F₃. The third and last important deformation produced a strong almost vertical cleavage of similar strike to that of the second phase and some minor upright folds.

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