



# Bergvesenet

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## Rapportarkivet

|   |                                   |                  |                                  |                               |
|---|-----------------------------------|------------------|----------------------------------|-------------------------------|
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| Tittel<br>Report on mapping of the area south of Evenesdal.   |                                   |                  |                                  |                               |
| Forfatter<br>JOHANNESBERG D.  |                                   | Dato<br>1967     | Bedrift<br>Sulitjelma Gruber A/S |                               |
| Kommune   | Fylke                             | Bergdistrikt     | 1: 50 000 kartblad               | 1: 250 000 kartblad           |
| Fagområde   | Dokument type                     | Forekomster      |                                  |                               |
| Råstofftype   | Emneord                           |                  |                                  |                               |
| Sammendrag<br>Rapport om generell berggrunnskartlegging sør for Evenesdal. Bergartene tilhører Furulund-gruppa og en sekvens av gilmerskifre. De forskjellige typene av bergarter er skildra. Kun sma tendenser til mineralisering (ukjent type) i kalk-silikat-skifre. Kort strukturell tolking. Berggrunnskart i rapport 522.144.002. |                                   |                  |                                  |                               |

## Report on mapping of the area south of Evenesdal

by D. Johannesberg

Introduction

The rocks within the area are, in the main, sediments which have been subjected to metamorphism and deformation, both of which occurrences took place in the Caledonian Orogeny.

Topographically, the west of the investigated region consists of fairly flat moorland where average elevation is about 650 metres. This forms about a third of the total area, the remainder being mountainous and rising to a maximum elevation of 1625 metres on Salertind.

Sequence of rock units.

Structurally, most of the area lies above the Furulund group. These upper rocks have been divided up using divisions on the same lines as those of L. A. Barkey (Geological map of the Junkerdal Region 1958). Division has proved difficult due to extensive intercalation of the different rock types.

The sequence is as follows:

|                      |   |
|----------------------|---|
|                      | Upper calciferous biotite schists<br>with amphibolite |
|                      | Upper Muscovite schists                               |
| Mica schist sequence | Lower calciferous biotite schists<br>with amphibolite |
|                      | Middle Muscovite schists                              |
|                      | Garnetiferous mica schist                             |
|                      | Lower Muscovite schists                               |
|                      | Furulund gneiss                                       |
|                      | Calc-silicate biotite schists                         |
| Furulund group       | Muscovite schists                                     |
|                      | Biotite schists with amphibolites                     |
|                      | Graphitic mica schists.                               |

Description of rock types.

The rocks which are structurally highest are described first.

Upper calciferous biotite schists.

These are quite variable: some bands are very rich in calc-silicate while others are very biotite rich. Commonly these two types are closely intercalated. "Eyes" of quartzofeldspathic material are often present.

Some bands are particularly carbonate-rich, but no marble bands were found. The rock is grey in colour, with good schistosity.

A band of coarse amphibolite is present, it has a distinctly gneissic texture, containing aggregates of quartz and feldspar together with green hornblende. Biotite is the other main constituent. Associated with this amphibolite is a granitic intrusion and quartz veins.

Upper Muscovite Schists.

These rocks have a high muscovite content, although some biotite may also be present. The other main constituents are quartz and feldspar. They are variable in texture, there being coarse-grained schistose types together with fine-grained siliceous types. In general, however, they are massive rocks with poor schistosity, weathering intensely to a rusty brown colour.

Lower calciferous biotite schists.

These are the same as the upper biotite schists, and need no further description, except for the fact that thin bands of fine biotite-rich amphibolite seem to be a particular feature of this group. The same type of coarse-grained amphibolite is present as in the upper biotite schists, it being again intercalated with a granitic intrusion and quartz veins.

Middle Muscovite schists.

These are the same as the upper muscovite schists, but there is a greater abundance of quartz veins and granitic intrusions.

The granite is very rich in quartz and feldspar, the mica content being low.

Garnetiferous mica schist.

This is a massive mica schist, containing both muscovite and biotite.

There is a contact

There is a high garnet content in this rock, the garnets being in the main small (about 1 - 2 mm in diameter), but there are some skeletal garnets of a larger size: The rock is rich in quartz and feldspar, these minerals forming numerous eye-shaped segregations. Locally, the rock may have a particularly high quartz - feldspar content and becomes gneissic, but the group as a whole is quite uniform.

Two amphibolite bands are present in this group, the more easterly of the two being very similar to that found in the upper and lower biotite schists. It is a coarse-grained, massive rock with very poor schistosity. The main constituents are green hornblende, quartz and feldspar, biotite being also present.

The other amphibolite is not so coarse-grained. It is a friable rock with a high amphibole content and a smaller proportion of quartz - feldspar than the other amphibolite. Some biotite is also present.

#### Lower Muscovite Schists.

Although muscovite is the dominant mica in these schists, there is often a not considerable proportion of biotite present.

Quartz and feldspar are quite abundant and often there are large numbers of small garnets, although the rock is not nearly so rich in these as the garnetiferous mica schists.

Locally the rock is siliceous, and becomes very hard and fine-grained.

At the bottom of this group are two bands of crystalline marble, either or both both of which lens out locally.

#### Furulund Gneiss.

The rock found under this heading in the investigated area appears to be in the correct structural position for the Furulund gneiss, but the question as to whether it is or not is a difficult one. The rock itself is a coarse-grained gneiss containing quartz, feldspar and mica (mainly biotite). Locally there is a high garnet-content. It is broadly concordant, particularly in the north of the region where it is rather thin.

Farther south, however, in Galagaldalen it is thicker and is intercalated with calc-silicate schists and marble both of which were outside it in the north of the region.

#### Calc-silicate schists.

These are finely schistose rocks which in parts are found to have a high

calc-silicate content indicated by their green colour.  
Biotite is usually also present.

Muscovite schists.

These massive, rusty weathery rocks occur in the north of the region. Locally they contain a high proportion of quartz-feldspar segregations. In Galagaldalen they appear to be partially replaced by a kyanite-bearing mica schist. This is a distincture rock containing kyanite crystals of average length about 2 cms. These crystals are arranged with their long axes parallell to the schistosity planes and are all lineated parallell to each other. This rock also contains garnet. Below these kyanite bearing rocks, this group is represented by a coarse-grained quartzo feldspathic mica schist.

Biotite schists with amphibolites.

The rocks in this group are a mixture of biotite schists containing segregations of quartz-feldspar, calc-silicate schists and amphibolites. The amphibolites vary from thin bands of fine green amphibolite to coarse-grained amphibolite with a high quartz-feldspar content.

Graphitic mica schists.

The graphitic shists form the lowest rocks in the region. They are only slightly graphitic and, together with the mica schists exhibit a crenulated cleavage.

Other rock types.

Granite gneiss.

This was found at only one locality, the summit of Salertind. It contains high proportion of quartz and feldspar, together with mica. It is not given a stratigraphical position.

Granite.

Numerous small granite bodies occur throughout the area. The granite is mainly quartz/feldspar with a little mica.

Ore Zones.

The only ore zone found was within the calc-silicate schists of the "biotite schists with amphibolites" group.

A very small amount was present within these schists.

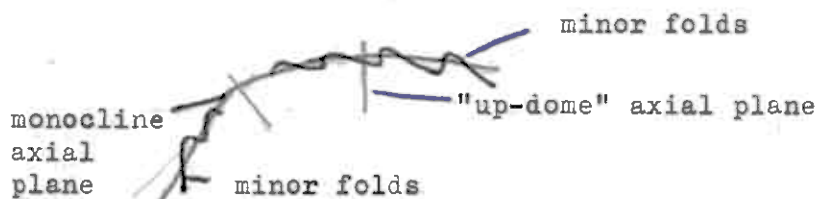
Note.

It was not found possible to make absolutely precise divisions between the top four major rock units due to extensive intercalation, for instance in the lower biotite schists bands of muscovite schist occur. The divisions here were therefore chosen on the basis of the dominant rock type giving its name to the group.

Structure.

In the western half of the area the rocks have a broadly North-South strike and a steep dip. This dip is to the East in the far West of the area, being about  $80^{\circ}$ .

Going East, the dip eventually becomes westerly, being about  $10^{\circ}$  in the central part of the area and decreasing steadily to about  $40^{\circ}$ . There is then a sudden change to almost horizontal. The beds remain shallowly dipping in the east of the area. Thus it seems certain that the eastern two - thirds of the area is an anticline. The sudden change in dip shows that it has a monoclinial form. However, to the east of the hinge of this monocline, there still appears to be some up-doming. This up-doming is probably later than the monocline because the minor folds retain the same sense of overturn as they pass over the dome, as illustrated below.



Further evidence for an anticlinal structure lies in the sense of bending of the larger rock units indicated on the map in the east of the area.

From measurements made on minor folds, the anticline seems to have a gentle plunge of about  $5 - 10^{\circ}$ . The direction of plunge is about  $160 - 180^{\circ}$ .

In the North-East of the area, the dip is shallow, the average direction seeming to be about South-Easterly. Further to the south, in Galagaldalen there is much folding but the average direction seems to be North-Easterly. In addition, minor folds have been found in this area whose trend is East-West. This seems to indicate a synclinal structure with a flat East-West axis. The structure in the South-Eastern part of the area is unknown due to insufficient data as a result of difficult terrain.

The structure in the Western part of the area, where the dip is steep is very uncertain, but it seems likely that there is some light folding between the above anticline and the syncline to the west.

Note on use of the map.

1. Some of the boundaries could be put on only approximately because they occurred in inaccessible crags or beneath scree.
2. The boundaries marked on the south side of Batfjellet, are very approximate but the rocks marked thereon are known to exist due to their presence in the screes.



Samples of rock types.

| Sample No.                  | Stratigraphical position                        | Locality found  | Description                                     |
|-----------------------------|---|---|---|
| T 9/9                       | Lower calc biotite schists                      | In Sauvasselva  | Intercalated biotite schist/calc-silicate rock. |
| V 5/6                       | "   | Near Jakv <sup>t</sup>                                    | Coarse-grained quartz-feldspar amphibolite      |
| V 7/6                       | Garnetiferous mica schists                      | Ridge between øv. and m. Sauvatn.                         | Garnet - mica schist.                           |
| U 7/4                       | "   | Ridge of Båtfjellet near point 1173                       | Medium-grained amphibolite.                     |
| U 9/15                      | Lower Muscovite schists                         | Side of Båtfjellet above Galagaldalen                     | Crystalline marble                              |
| S 15/2                      | Furulund  | Side of Salertind above Evenesdal                         | Furulund gneiss                                 |
| U 9/17                      | "<br>(Muscovite schist equivalent)              | Galagaldalen  | Kyanite-bearing mica schist                     |
| T 17/3                      |   | Summit of Salertind                                       | Granite gneiss                                  |
| S 17/7                      | Furulund<br>(Muscovite schists)                 | Side of Salertind above Evenesdal                         | Muscovite schists                               |
| S 17/1                      | Furulund<br>(Biotite schists with amphibolites) | Salertind, above Evenesdal                                | Biotite rich schist.                            |
| V 9/2                       | Furulund<br>Graphitic mica schists              | Outcrop above Solvaagv <sup>t</sup> on side of Båtfjellet | Graphite schist                                 |
| U 9/7                       | Furulund<br>(Muscovite schist equivalent)       | Galagaldalen  | Coarse-grained quartz-feldspar mica schist      |
| <u>Ore Sample</u><br>515/20 | Furulund<br>(Biotite schists with amphibolites) | Kvitb <sup>k</sup> above Evenesdal at 234225              | Calc-silicate mica schist containing pyrite     |



Key to 1: 50 000 map.

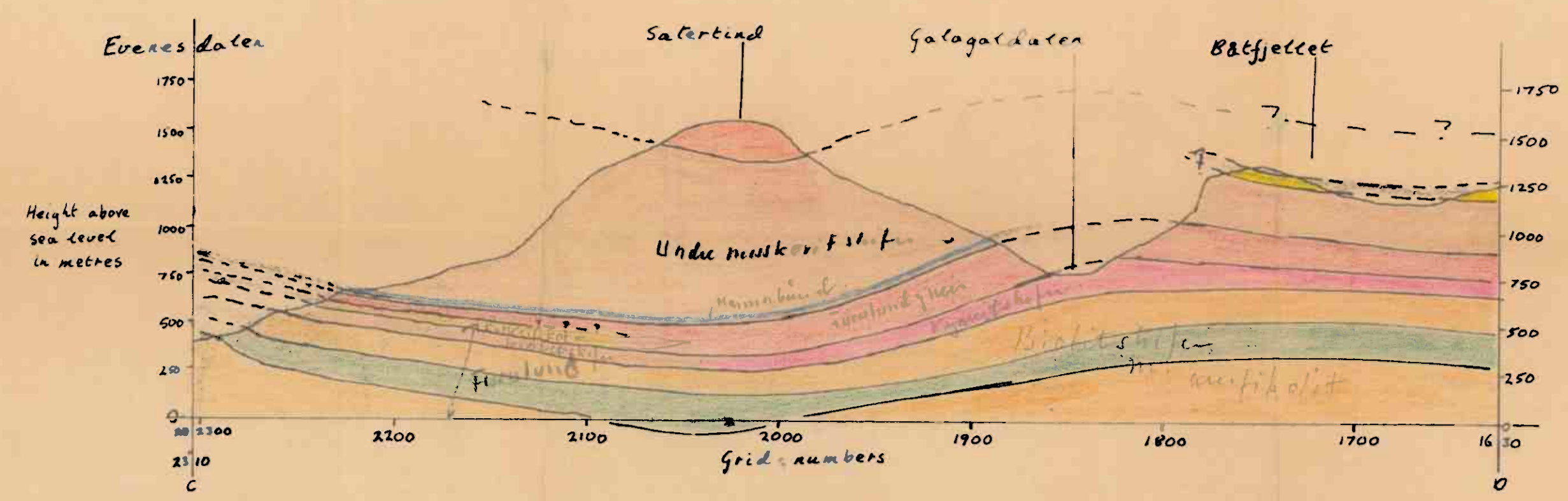
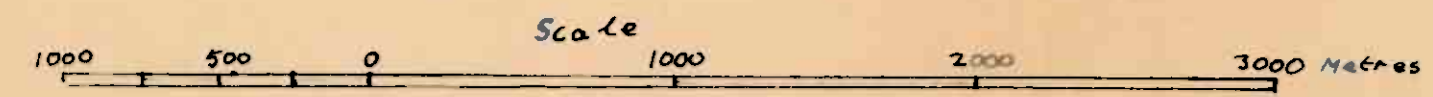
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|                      |   |                  |
|----------------------|---|------------------|
|                      | Upper calc biotite schists                    | 101/6            |
|                      | with amphibolite                              | 101/23           |
|                      | Upper muscovite schists                       | 101/35           |
| Mica schist sequence | Lower calc biotite schists                    | 101/6            |
|                      | with amphibolite                              | 101/23           |
|                      | Middle muscovite schists                      | 101/35           |
|                      | Garnetiferous mica schists with amphibolites  | 101/7<br>101/23  |
|                      | Lower muscovite schists with Marble bands     | 101/35<br>101/2  |
| Furulund group       | Furulund gneiss calc silicate biotite schists | 999/20<br>101/26 |
|                      | Muscovite schists                             | 999/59           |
|                      | Kyanite schists                               | 999/90           |
|                      | Biotite schists with amphibolites             | 999/30<br>101/9  |
|                      | Graphitic mica schists                        | 999/59           |
|                      | Granite gneiss                                | 999/70           |
|                      | Drift deposits                                | 101/5            |

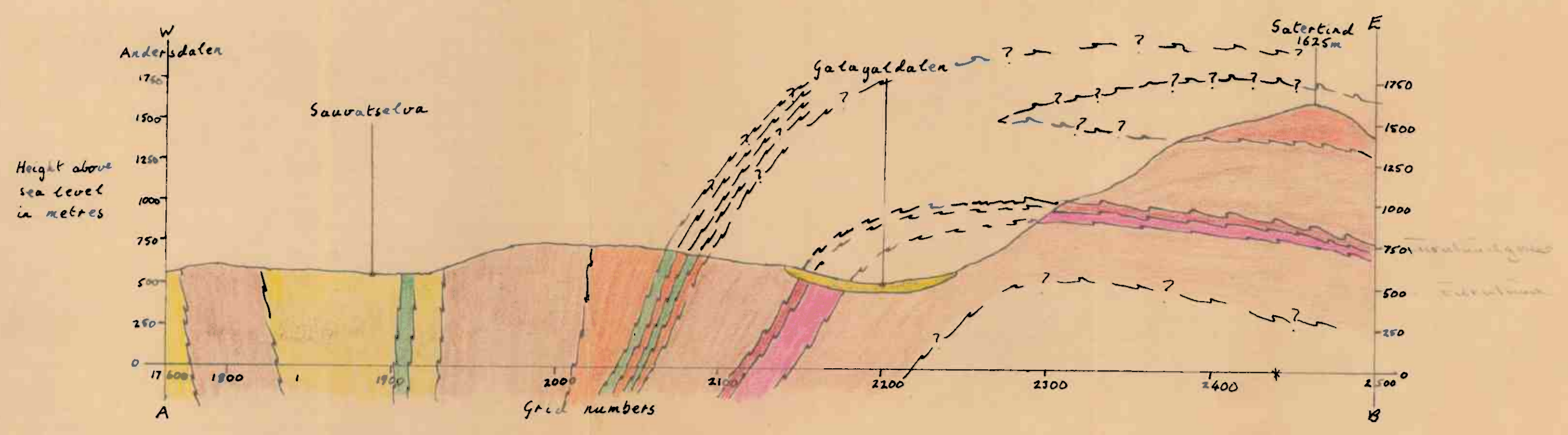


Scree and inaccessible crags.

Section Eversdalen - B&tfjellet (North-South along line C-D on map)



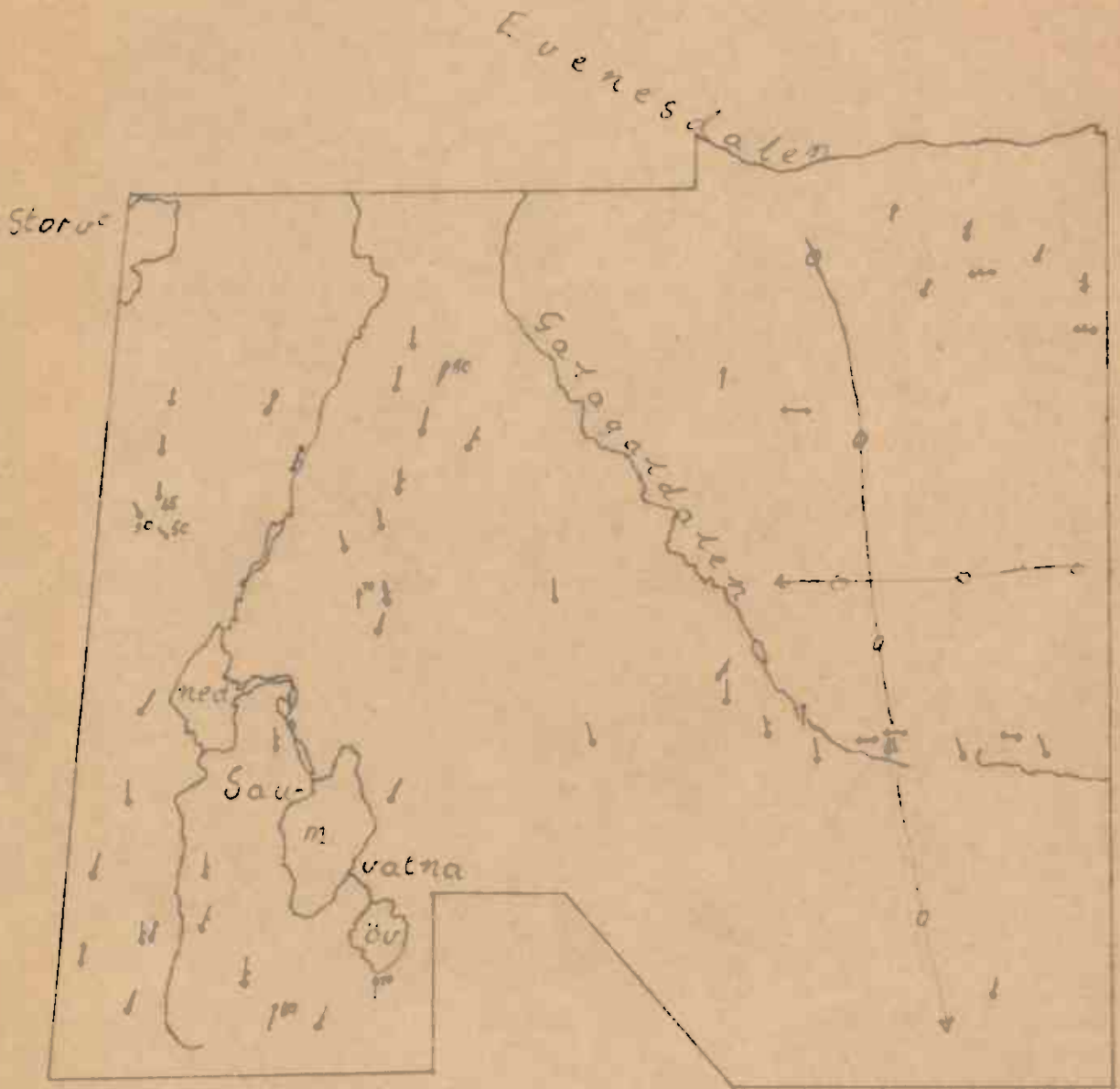
Section Andersdalen - Satertind (West-East along line A-B on map)



|                           |           |       |
|---------------------------|-----------|-------|
| Horizontal scale 1:25,000 | Malestokk | Tegn. |
| Vertical scale 1:25,000   |           | Tric. |
|                           |           | Kfr.  |
| Erstattet for:            |           |       |
| D. JOHANNESBERG           |           |       |
| Erstattet av:             |           |       |



Structural map B: Fold Axes



Major Fold Axes

Structural map A: Schistosity Trends

