

Bergvesenet

Postboks 3021, 7002 Trondheim

Rapportarkivet

Bergvesenet rapport nr BV 2260	Intern Journal nr	Internt arkiv nr	Rapport lokalisering	Gradering Fortrolig
Kommer fra ..arkiv Sulitjelma Bergverk A/S	Ekstern rapport nr "522116002"	Oversendt fra	Fortrolig pga	Fortrolig fra dato:
Tittel Geologiske undersøkelser Storfjella V for Balvann.				
Forfatter KOLLUNG, S / FINDLAY, R.		Dato 1970	Bedrift Sulitjelma Gruber A/S	
Kommune	Fylke	Bergdistrikt	1: 50 000 kartblad	1: 250 000 kartblad
Fagområde	Dokument type		Forekomster	
Råstofftype	Emneord			
Sammendrag Generell berggrunnskartlegging i området Storfjella , nordvest for Balvann. Malmsone mellom Storfjell og Tverrfjell ble fulgt opp. Fullstendig stratigrafisk og petrografisk oversikt over 7 avdelinger. Kort omtale av tektonikken. Feltet er fattig på mineraliseringer - kun spredte rustsoner med pyritt-impregnasjoner. Saltdal.				

conventions in mapping

• 6 - station and number

20
✓

- dip shown thus, short line indicates direction of dip, long line the strike, and the number, the magnitude of dip.

Notebook

56
✓

Station number, followed by grid and dip usually. blue blue

k.p.h. - Green Phyllite

k - green

~~g~~ phg - Grey Phyllite

g - grey

w.q. - white quartzite

w - white

q - quartzite / etc

br - brown

s - schist

b - black

gf - graphite

ph. Phyllite

ch - chlorite

b - biotite

lt. marble

B - Blue stone

py. pyrite

G - Greenstone

op. chalcopyrite

m - muscovite

he hematite

ga - garnet

pbi. biotite porphy

a. amphibole

v. volcanic

GA ~~alt~~. Gabbro

rh. rhyolite etc

A amphibolite

522, 116, 002

R H Findlay

Sulitjelma 1970

Geology (field notes)

Volume I

Amphibole gabbro

GP - Pyroxene"

CA for notebook

16 June 1970.

Walked round N
shore of Blamvatnet towards
E, back to road across
hills

✓ Balvatn Map.

see

↓ 418303 Brown weathering graphitic phyllite
Fine grained muscovite Small
micro microfolds

S 20° to 282°

↓
20 yds down road Small garnets 3 mm 10%
in same.

2/ 421295 Brown grey weathering graphitic
phyllite - bands of quartz up
to 1 metre long, few.

3/ 424294 White weathering grey-green light
rock, coarse 2 mm to fine muscovite
also chlorite and feldspar
plagioclase in places, but more
phyllitic type predominates

4/ 428294 Shiny grey fissile rock, mica schist
with bands of quartz banding at
18" intervals approx. Considerable
very fine grained muscovite - NOTE
also numerous little black bumps
0.5 mm on S surface - garnets ???
NOTE - numerous small microfolds
along strike

S 12° to 20°

↓
150 yds E
along shore. Interbedded with a less shiny grey
brown weathered mica schist in units of
9 inches to 12 ins. Also numerous pits
caliche bands mainly in the
shiny phyllite

5/ 438294 As above

S 14° to 320°

LUNCH.

Graphite phyllite / schist - as 1
Grey green phyllite as 3
Banded phyllite. Mica schist
interbedded with muscovite schist - as 4

Stratigraphy ↑ ?

6/
↓
100 yds E across
Bays.
Green schists / phyllites with quartz
filled gashes about 2 feet long
6" wide - dipping under 5?

7/ 441291 Grey weathering fairly fine grained
mica schist, much muscovite,
some biotite, quartz streaks 2 mm
S20° 6272° width, fine grained, with calcite?

8/ 451299 Shiny grey mica phyllite
and grey weathering mica schist
S20° 6300° Small microfolds as usual
- as 4 Note - ~~also~~ bands
as 4

Note - This stream so far lies
in grey banded phyllite
- as 4

The top of the hill overlooking
this stream is of green schists

Stratigraphy?

Upper Phyllites inc. graphiteschist/
Green schists

Grey Banded Phyllites

444311

10 S28 to 300° Grey phyllites - are
these U. phyllites as dip could
carry them over the hill top
of the green schists.

↓
200 yds W - Green schists reappear

439318

11 S20 to 300° - Upper phyllites outcrop.

June 17th 1970 *Sulitjelma Maps*

Traverse from Kelvatn to Kong Ocar Mine,
swing east after tunnels, then
back ~~off~~ over hill 894 to
Kelvatn.

12 Kelvatn ~~at~~ a grey weathering
biotite schist with
fine quartz et al.

S20° to 325°

455406

50% - 60% biotite 0.5 mm.

↓
Overhill (E)
along path
to next
bridge.

Passing green
amphibolite rock with
SD/SD amphibole &
Fdsp + a little platy
biotite on hill.

at bridge grey biotite schist
again outcrops.

13 460405

530° to 334°

a grey weathering
biotite schist - plates
of biotite. Summs. also
finer grained white &
and greenish minerals.
Large biotites 50% to 70%
Numerous bandings of
quartz/calcite, and also
of the rock itself.

↓
50 yds round N.
shore of pool.

Amphibolite again,
sheared, 70% amphibole
Summs length?

465401

14 520° to 330°

Lamination

10° to 255°

Green

Chlorite biotite schist

Biotite plates (mm)

30%, rest predominantly

↓
100 ft up.

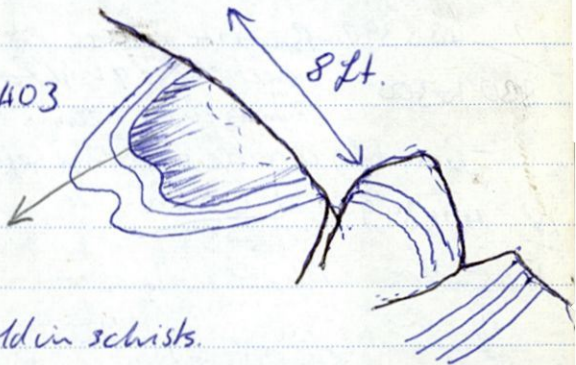
chlorite. Note well marked
lineations.

Come back into brown schists -
with biotite.

↓
to top of
hills

A coarse gabbroic amphibolite
Gabbro.

15. 471403



axis
38 to 260°

Fold in schists.

Note further down biotite
schists with biotite lying
across S. (in plates).

Passing down over gabbro
& schists from top of hill
we come to acid volcanics -

16 482398

Dip 36° to 320° Acid volcanics.

- cross boundary
after about 100 yds
into a fine ~~gneiss~~ S

17 485397 Biotite ~~gneiss~~ S

530° to 300° Venicles of quartz/feldspar.
2mm wide - 2mm long.

- Probably a calc schist on reflection?

18 491399 Lunch.

335 to 305 Phyllite = schist

↓
15 yds
upstream

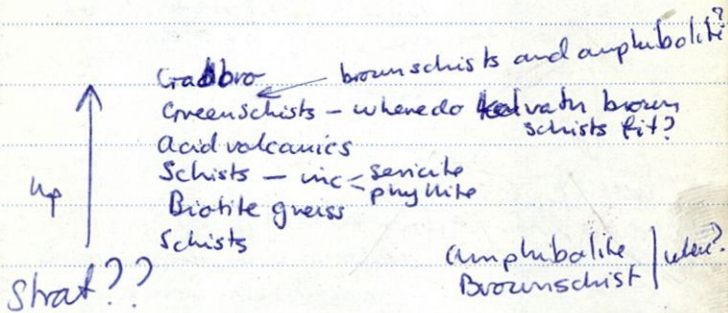
Sericitic schist
~~tan~~ - whitish, and
became more schistose than
previously. V. fine grained
muscovite.

19 480 407

S45° to 295° "Green" Schist.

— as underlies Gabbro on way
down before lunch.

On hill top - rocks of gabbro
facies - yellow weathering
boulders of dunite.



June. ~~July~~ 18th. *Sulitjelma map*

A shorter traverse than
same place up to outcrops
of gabbro, to map in the
gabbro.

20 / 456406

S 20° to 290°

In stream bed.

Spec. 20



Across stream
and up hill.

20A

Specimen



2 1/2 yds up

Specimen

460407

semi-calc.

A grey schist
with much fine
biotite interspersed
with thin bands of
a greener biotite schist
with few but larger
plates of biotite.
Powdered reacts with acid.
Biotite 70%

Note small microfolds
and a few quartz boudins



~~Top~~ till top of
dark green amphibolite
- coarse green hornblende
90%. Rest white
v. fine ~~matrix~~, feldsp.
no calc.

A dark green semi-
schistose massive
rock with plates
of biotite.

S 85° to 330



S surfaces
— as seen in
outcrop.

Biotite 10% 2mm
white minerals
Feldsp. 30% fine
fine dark
green
minerals
(amphibole) 60%.

a streaked amphibolite,
coarsening to —

50 yds — a coarse F. white
North to
crest feldsp / hornblende
amphibolite — Gabbro

22 In place?
464407

S 30° to 310

dubious

a dark green fine
grained massive rock
showing a v. poor schistosity
+ one ill defined banded
structure, 9 inches long.

Fine grained biotite 30%

Dark green mineral
~~amphibole~~ 65%
chlorite?



At end of this outcrop
is a more schistose ~~containing~~
rock with ~~and~~ oriented
biotite ⁱⁿ and fine grained white
and dark green matrix
(dsp + ~~pl~~ chlorite)

23 465 405

S38° to 314° A dark green ~~schist~~ fissile
badly weathered
schist with biotite
porphyroblasts 1mm
angled across S.
Exposure poor - in place?
Biotite porphs 20%. 1mm
Fine dark
green matrix 75%.

24 467 404 light green-grey to
brown weathering, fissile
S20° to 200 green schist.

(The dark green ^{biotite} porphyroblasts
schist (23) is about 40ft
below)

- Dark green phyllitic
chlorite schist + small
amounts of calcite.

24 is in the same series as 23
- porphyroblasts of biotite (1-2 mm)
appear just a little higher.

↓
70 ft.

- Gabbro contact. Below the
25 gabbro proper is a more
schistose rock. of 22 and 21
perhaps. - shows v poor
schistosity, occasional bio.
porphs. and some streaking
of minerals - about 10 ft outcrop
width, overlain by gabbro
proper.

Following contact round - the
gabbro is considerably sheared
in places.

Coarser? Gabbro

Sheared gabbro/green schist
~~Coarser Gabbro~~ green schist + porphs.

26° Schist
S 22° to 244° - sheared
gabbro

468403

The gabbro has definitely
been sheared as shown
by orientation of minerals^{spec.}
- also formation of biotite. 27

The boundary is drawn above
this sheared rock between
the massive gabbro and the
sheared type.

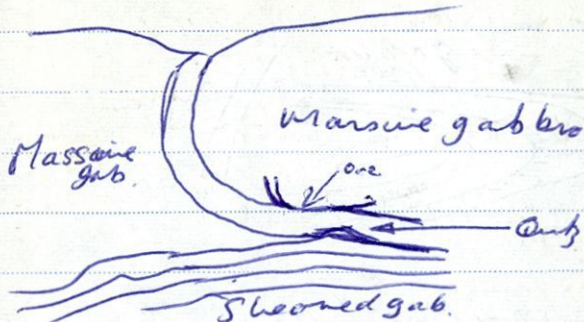
300 yds road contact from 26,
Quartz vein - no mineralization
2" 6' ins wide, running
to 320°

468401

28 Note for 4 quartz veins
on this traverse.

Quartz between sheared gab.
(or is it greenschist?)

- pink - shows pyrites in
small amount,
vein 2 ft wide,
runs to 340° approx.



- also ^{very} few greenstains



50 yds round contact - small vein
with calcite, & pyrite cubes 5 mm.

29 - in highest of gabbro in
gab vein. Also nodule of
pyrite - remains of cube -
468400 1 inch side.

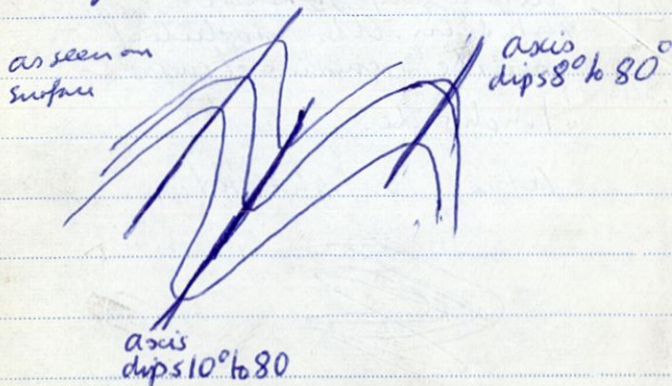
at 29 v. light folia.





Axis - roughly dips
 30° to 270°

470 400
 30 Sheared gabbro. from
 fold



6 feet



in profile.

31 / Just 30 yds along R E from
30, quartz has unaded folds
471399 in this sheared gabbro,
cooking it thoroughly, ~~concordant~~
Invasion concordant with S,
and is much folded - ~~deep~~
width 6 ft, perhaps
deeper. Note cubes of
pyrite from 1 mm 10 mm -
run concordant with S.

- lack of time prevents
full investigation - but
this band may well be
bigger than appears at
first sight.

32 Sheared gabbro /

470 403 green schist

538° to 300° porphs of biotite 1 in 25%

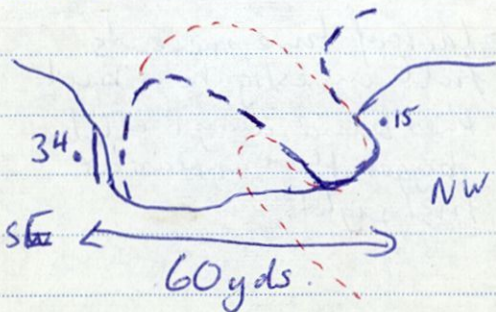
in green matrix 75%
weathers greenish.

Visibility poor.

Spec

33 only - gabbro from 20 yds
N of 32.

34 S of sheared gabbro
472 403 vertical.



Strike 260°

NOTE - there is considerable
very tight folding in
the small valley between
stations 34 and 15,
on the same axis as 15
approx 260° .

35 470 4045 leached gabbro - green
schist?
530° 6160 bio. porphs in green matrix

June 19th.

37 ~~Just below~~ ~~Barrett~~ ~~field~~ Sulphurina Map

38 20° to 320° grey-green phyllitic?
479 448 biotite porphyroblastic
Monk schist.

12° to 350 - fold axis - tight
fold



↓
200 yds
uphill

a calcareous massive
fine to medium ^{grained}
grained rock with
biotite, 40% up to 1 cm
muscovite 20%
quartz 10%
~~massive~~
chlorite 30%.

Calc semi-pelite

39. 483 448

S 25 to 300. Prof. Greygreen
fold axis biotite porph schist
2° to 200 with very calcareous
- 215 bands - cf. 36.



Gabbro
Banded rock.

Porphy. schist - banded in calc & noncalc layers
Calc semipet - more massive
schist

40 485438

Acid volcanic
contact against & fine
gabbro - Acid volcanic. Have
a light green rhyolitic
rock.

- Note one gabbro glaze &
in rhyolite



50 yds on

i) 34° to 308°
ii) 34° to 290°



Dark green
matrix

2"
Kfsdp
K. feldsp lens
+ quartz + white
feldsp

Kfsdp

Crossing the stratigraphy
down we see 1st the light
green rhyolitic rock, then into
a grey more schistose perhaps
acid volcanic rock.

The rhyolitic band is perhaps
40 yds wide.

after volcanics a streaked muscovite
biotite calc schist.

Gabbro

Volcs

Muscovite biotite calc schist.

~~grey green schist~~
~~non calc schist~~
~~greyish volc~~
~~dark green~~
~~grey acid volc~~
~~dark green schists~~
Turn back

SE

Headed ~~SE~~ across ground
giving much outcrop and
turned back from 495 426 to
480 432, crossing the following
outcrops.

dark green schist
grey acid volcanic
~~grey~~ calc semi pelite
dark green schist
grey acid volcanic
non calc. pelite
grey green volcanic
~~green vol~~
dark green schist
gabbro
calc biotite streaked schist.

Furmland schists give 3
main groups

- i) grey green brown weathering
streaked calc. biotite schist
- ii) grey weathering ~~banded~~ calc
banded non-calc-biotite-
porphyroblast schist

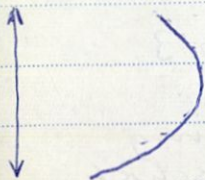
, brown weathering, massive
le semipelite schist.

June 23rd 2300h

Sulitjelma map.

From hut below Kervtoppen to S. showed
lens and

41 at hut - Note fold across
stream from hut - in
S 45° to 80° greenschist
axis



42
~~580~~

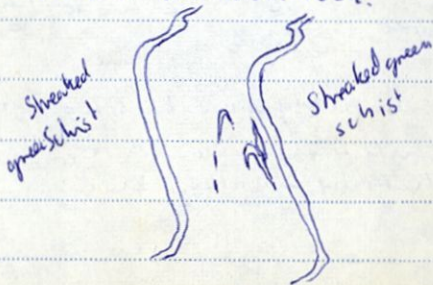
Following along

586° to 80° shore of lake, good exposure in a streaked fissile/massive green to light grey green weathering green chlorite - biotite-amphibolite

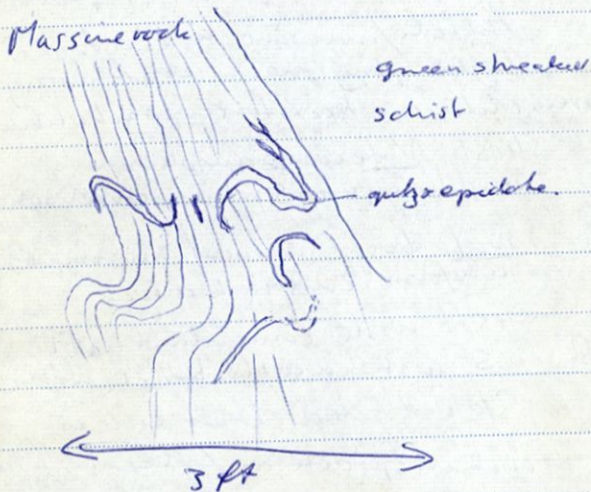
↓
250 yds schist. Note coarse amphibole needles up to 5 mm in greenschist

Note large area of massive uniform un-streaked rock.

Fold axis 100° to 350° 15 ft. wide concordant with S, just across the beach - the folded schist either side is rich in epidote, and there are drag folds and a few tension gashes in the boundaries to the massive rock.



The massive rock is similar to
the coarser bands in the schist.



Schist.

Amphibole	40%	1 mm to 10 mm
Feldspar	10-15%	Fine to 1 mm or less
Epidote	30%	Fine

Also probably some biotite fine to coarse
chlorite and muscovite. No
calcite of mentionable amount.

Falling lakeshore - more
muscovite; ~~to~~ med. grained,
much less amphibole and
epidote.

3
44 100 yds
w/ stream
at far side
of lake.

Green schist.

Much richer in muscovite
- ~~to~~ fine grained, fissile,
Muscovite to 50%?

S30° to 295°

Boundary between green
schist and grey phyllite
just below - ~~following~~
becoming very green ~~then~~
down.

44 S20° to 300° - Green muscovite phyllitic
schist - as above

45

S30° to 320° A medium grained
grey to grey brown
weathering poorly calc
biotite schist - Note lenses
and streaks of ferruginous
minerals

46 38° to 846° - Dark grey
graphitic schists,
brown weathering
(as 1)

47 Lush Lake
 838° to 320° Grey phyllite

48 830° to 305° Grey phyllitic biotite
muscovite-quartz schists

49 $S 65^{\circ}$ to 290° ^{Green} ~~Grey~~ phyllitic
biotite muscovite
schists.
Green ~~grey~~ phyllite series

$S 20^{\circ}$ to 295° - 30 yds down,
still in ~~Grey~~ Phyllites
Green

- 30 yds down - parts
of hill have solid
bedding - also

magnetite in Green Phyllites
(could the 'garnets' in
(1) be magnetite?)

50 Fold in green mica schist



NOTE - this green schist
gives a positive reaction to
HCl

51 Green phyllites

S 15° to 285°

at stream outlet from

north end of small lake

- Green Schist, bounded
across stream by grey to grey
green phyllite

52

Greenschist

S 30° to 240°

30ft down towards
lake - Green Phyllite

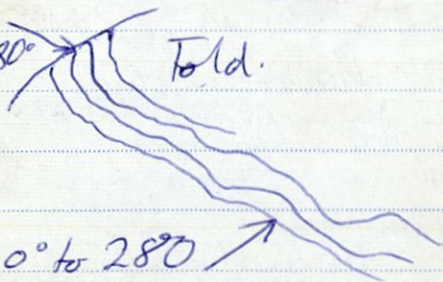
53

little exposure from
last station apart
from that to mesquite and
Green Phyllite

axis
10° to 180°

Told.

S 30° to 280°



Grid and
Dip, etc.
and station.

Description.

Sulphelma
Map.

June 23rd.

From hut at 471328 along
N. side of lake to 497328
to 475335 and back to
471328.

54

S 30° to 275

Following round shores, good
exposure - green schist /
green phyllite boundary
crossed at 472330. Garnet

3mm in phyllite near this
station.

55 479328

S 20° to 290

Following lake shore - phyllites then
Greenschist - more massive -
underlying phyllite
across beach & 2 streams
cutting beach - phyllite.

Lineation dips 15° to 294°

↓
200 yds

S 20 to 318

Graphitic schists - very brown
weathered.

Note - graphitic schist
little more than
20 ft thick, other
side is phyllite

↓
Round
point

~~Phyllite~~
or Schist / Phyllite

a graphitic phyllite - only
a few feet thick - becomes
much darker and more
graphitic lower down.

- cross beach
outcrop - blocks of phyllite
rather than graphite
- graphite schist can be
seen outcrop up hillside.

Phyllites - then an argill.
brown staining micaceous ls.
with occasional rounded qtz -
up to 5 mm.

56
481 325

↓
50 yds

Mica - 30%

Qtz - 20%

Back into phyllites

20 yds.



S 35° to 275°

Near 100 yd are given to
phyllites and graphitic phyllites /
schists.



20 yds

S 30° to 300°

In good exposure - phyllites

57 483324

Cross beach - poor exposure

S 10° to 340°

Graphite schists and schists
phyllites with magnetite

Since 57 in graphitic schist

58 485323

Dark grey banded and
banded graphitic schist

S 14° to 800°



100 ft up

Grey green phyllite



S 10° to 330°

100 ft up,
other side
of gully

Dark
Graphitic schist - some
pale green mineral staining
on surface

Left lane.

S 16° to 300°

After climbing up gully,
and following line to
gap in hills over 300 ft
of ground with poor exposure,
boundary between graphitic
schist and a white
muscovite phyllite - note
quartz boudins, 12 inches,
along boundary.

white mica phyllite



graphitic schist.

59 up 300 ft

484 326

After gap in hill break of slope,
crossing gently rising marshy
ground - towards exposure on
other side.

S 28° to 270°

darkish -

as N limb
of small
anticlinal
fold.



at small crest a less dark,
brown weathering grey ~~purple~~
phyllitic graphitic schist - ~~more~~
+ a little muscovite.



axis perhaps
dips 10°
to 216 ??

Next few hundred feet not
so well exposed - back in
Phyllites before stream.

60 100 yds

483328

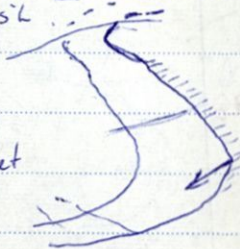
Across stream - exposure from
stream to cliff - none. in cliff - are
10 ft Graphitic Schist, between
phyllites

Just above a banded massive/
fissile calc?? phyllite/schist
quartz bandings. Is there also
the mixed Lst. present?

Specimen
6F - gne

Fold in 6F above the banded
schist

5 feet



axis
dips
10°
to
224

100 ft
above

Poor exposure

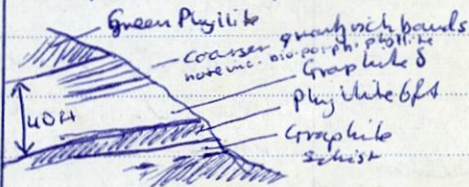
To a black graphitic schist
boundary not too clear, but

probably just below
outcrop.

Outcrop about 20-30 ft thick
-mantain by a biotite
porphyroblastic phyllite.

↓
20 ft up.

A very badly exposed
thin bed of Graphite Schist
- 6 feet wide if that!



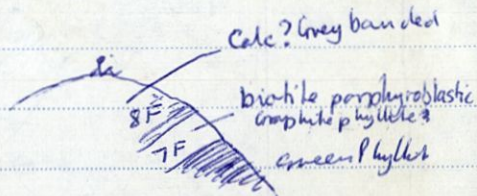
↓
20 ft up.

62 482 328
S 40° to 295°

ambitious

↓
20 ft on

S 16° to 290°



88

Part shearn outlet from
lake, or for ~~300~~ 50 yards of
Phyllitic rocks.

Greenstone / Greenschist
spec 9F, outcrops for about
30ft.

Here this rock is gneiss
~~dark~~ gneiss rounded 4mm max
50%

biotite, muscovite 20%
and green minerals
probably chlorite rest

calcite?? no acid!

Massive, shearing
faint schistosity.

↓
120 yds

63

482 328

↓
30 yds

Graphitic schist - thin bed
or possibly even just a lenced
bed 4 ft. -

Good exposure of
bio. porph. phyllites etc. etc. til -

Graphitic schist -

G.S.

Phyllite



Fold axes
clips
50 to 300°
(antward to
get)

↓
200 yds

Across ground good in
exposure of phyllite.

Fold core - axis 10° to
 190° - in Green
Phyllite.

↓
Good exposure

300 yds

In phyllite - inc
one grey bio-porphylastic
phyllite - 15 ft.

Grid 477334

From here to stream,
grid 475335 the rocks are
less well exposed, in
fact are not.

At stream just below
waterfall, grid

green phyllite with
garnets - ~~perhaps~~ in streaks
~~dipping~~.

520° to 260°

Garnets in streaks forming
a sort of lineation dipping
 15° to 300° .

June 24th.

Sutcliffe
Map.

Some confusion occurred today;
a gneiss stone forer of the
green stone was mistaken, and
~~over~~ wrong line? followed
300 ft

Above but fold axis dips
12° to 176° in green schist

64

↓
900 yds
NNW

Phyllites

~~Wrote a book - green schist -~~
~~also green schist~~
~~green phyllites - green schist~~

All str. 70.

Not exposed because
of muck

65

S10° 6244°

↓
Just across boundary from stone
green schist into green ~~phyllite~~
note kink folds in ~~phyllite~~ ^{green stone}
+ development of hornblende
wedged up 5 mms. Also
much biotite plads on S. surface.

grey schist.
Boundary of green ~~schist~~
and green ~~phyllite~~ stone
Somewhere along lake - boundary
not at all exposed - only
one outcrop, and that of
schist.

66

Fold axis

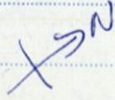
Dip 50°
to 1940S 5° to 100°
on a very
lubious surface

S 60° to 100°

- perhaps
the other
surface was
wasn't so lubious

Just about to run off
aerial photo.
Green Stone (schistous)
Gneisslike - on S. side
of small marsh, green
schist, boundary must
lie along marsh.

Cony
Green schist green stone
playlike boundary
found 25 yds NW
at end of marshy ground.



The boundary between

Covey
the ~~Green~~ Schist (only blue
in places) and the Greenstone
~~Phyllite~~ follows the line
of the small marsh -



NNWwards - towards
340° approx, the actual
contact being covered by
the marshy ground.

The ^{grey} schist is very biotite
rich in places, and also
has a lot of muscovite, which
tends to be deceptive
at times -

At end of marsh,
boundary swings NNE

200 yds towards small
lake, boundary swings SW.

N mag.



1" = 30yds approx

Grey
~~Green~~ schist inside Grey/Green
Phyllite/schist boundary
~~to~~ 30yds.

67 100yds N

475 352

Fold axis
~~strike~~ is

in direction
of 220° ,

no accurate
dip can
be measured,
dubious.

Round the hill some 20yds
~~back into green to Phyllite~~
in green phyllite stones
Fold axis $\approx 10^\circ$ to 175°

474 353

Large slide of blocks of green stone
Phyllite into and across
lake - neatly dividing into
two.

Boundary lost in lake.

From region of tubule to
stream inlet, exposure
all in phyllite, although
not good.

NOTE - MAGNETITE

up to 4mm - about ~~10%~~
5%

477 357

S 16 to 320°

SPEC 9F

On north side of stream
running into lake, a
~~grey~~ brown weathering
~~or~~ light grey (semi-graphitic)
phyllite - appears to
run up N. side of valley
bordering marsh.

over stream good exposure.
Green ~~phyllite~~ stone

477 357

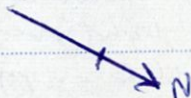
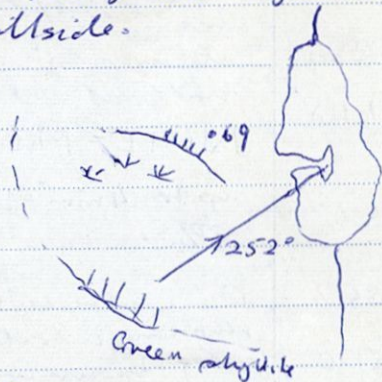
525 to 75°

59 478 356

~~14%~~
Green schist + a few pyrite
cubes

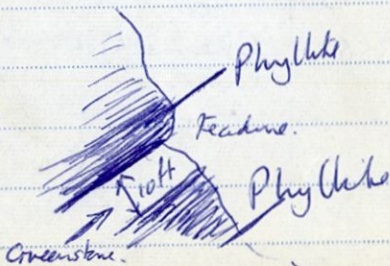


stone phyllite
 Note - green phyllite
 a few yards higher in
 hillside.



Overhill for $\frac{1}{2}$ mile
 in phyllite with good exposure.
 Green Phyllite, with
 magnetite.

479
 70 479 348
 522° 340



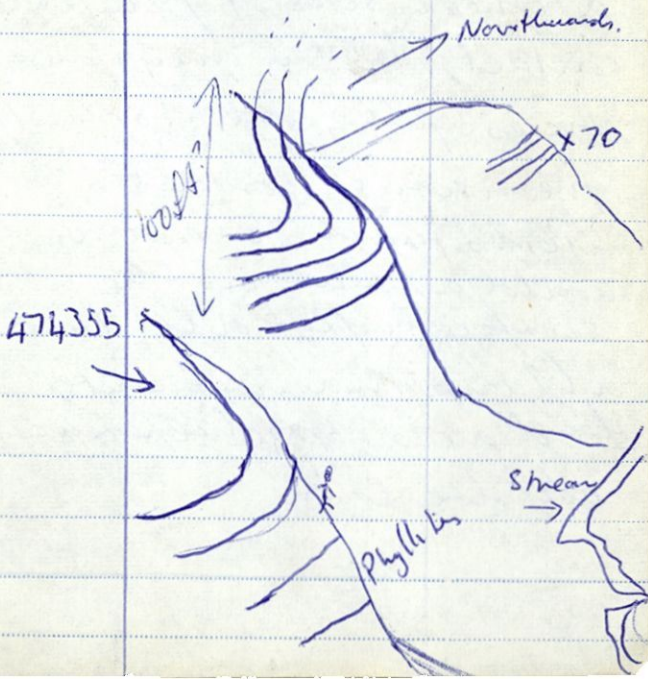
Concretion.

Note 10 to 15 foot greenstone
band - with needles
of hornblende.

Next bluff of phyllite + mag-
netite?

Walking SW towards lake.

None to poor exposure
little bluff overlooking
N end of lake.



No exposure except
for a few phylites
till a return to str 65
along lakeshore.

Note - the contact
followed was not of
a green schist / phylite
contact, but a grey stone / ~~bluestone~~
facies of the green schist /
greenschist contact.

Perhaps all is not as
would appear on the
surface after all, but
all dip measurements,
fold axes, grid references
etc are O.K.

June 28th

Sulitjelma Map

Near hut.

71

Greystone facies of greenstone

S 60° to 60°

Nearby a brecciated band.

471 331

- includes small phyllitic bands and greenstone bands.

72 469 332

S 35 to 286

Greystone / Phyllite boundaries runs in this valley, South side being greystone, north a phyllite - dark shing green with grey bands

↓
70 yds

Fold axis in calcite rich folds above
brecciated dips
8° to 176°

466 338

- from here to small bay and stream, good exposure in phyllites. Some magnetite in phyllites.

73. Fold axis in phyllite on S side of small bay.

5° to 190°

↓
80 yds

↓
For a long
good exposure
while in
hill

75 462340
Dip 30° to 246°
HILL 733

Phyllite
Quartzite 30 ft
Graphite
Schist

Across stream after crossing
ground with poor
exposure - across to
North bank of stream,
a brown weathered
quartzite schist.
- lower contact not
exposed, although upper
with a phyllite is.

a blue grey quartzite
grain size about 1-2 mm,
weathering to dark grey.
Note vague light and dark (20%)
bands - weather to give a rough
dirty grey surface.

The contact is fairly
clear and easy to follow,
although the quartzite
becomes more phyllitic
towards the quartzite /
phyllite contact.

Just below quartzite is
graphite schist

76

3461342

S26° to 40°

dubious, is it a
fallen block
of phyllite?

Down hill across poor (129 ^{pages} ~~pages~~)
exposure of graphite schist
across stream in green
phyllite. Brundage graphite S
1 phyllite not exposed.

77
S 30° to 300°

459 340

From hill across marshy
valley, green volcanic schist
- ~~Green~~ Slate? Dark green
schist

On way across moraines? with
rutile phyllite & graphite schist
seen.

78

458 339

From here into small wood
- out the other side a quartz
rich biotite ^{muscovite} ~~mica~~ semi ^{psam} ~~schist~~ ^{pelitic}
schistose rock grey to grey
green and light brown weathering

Qty. 40%

Bio. 15%

Musc. 30%

Dark Green
Heading 160° back over ~~Green~~ ^{Schist}
~~Slate~~ to bend in stream at
foot of these outcrops

79 459338

S25 to 275

↓
800 yds

Light grey very fissile
rock. Coney Phyllite

Poor exposure same
for bundle of phyllite
and one outcrop of phyllite
in this bearing. Then
green phyllites towards
hill crest

80 459336

S25° to 78°

Green phyllites



81 460354
S30° to 106°

Good exposure in phyllites.

Coarse 20ft schist
band in phyllites.
50ft

Lower down - in quartzite -
same rock as 81

↓
300 yds

82 459332

Stream section - reasonable
exposure from last station
to here.

S18° to 292°

Phyllites and more schist
phyllites in bands (as 81)

83 460325

Good exposure in green
phyllites as usual. Two
very graphitic pebbles found
nr. 83 - from the + anomaly?

Moving across ground good
in exposure of phyllite -
becomes richer in oxide
pyrite cubes (2mm)
Greenschist banding?

84 460321

S60° to 110°

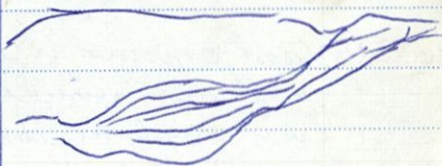
In the + anomaly, and
presumably still phyllites
No! green schists!

SPECIMEN
F10

A fair development of
pyrite (2mm max) - but near
surface well weathered
and oxidized - a greater
development than in other
green phyllites.

- or could not be the
~~greystone here?~~

On way to 85, coming
of anomaly hill, is seen
an epidote rich band of
'greenstone' - about 6 ft thick



good exposure to

462327
85
535° to 600

Green phyllites

86

465325

Fold axis dips

30° to 200°

Exposure not so good from
last station, although nothing
to complain about.

Green phyllite



Note - calc. rich band as at
72 just below - about 20 ft
below the fold ~~axis~~
where the axis was taken
from.

~~June 26th~~

~~88~~

~~Green phyllite -
a small amount of
copper ore was found here
but rather, but not~~

87

468324

Conglomerate, with acidified
iron pyrites, and lots of
mosquitoes

June 26th.

From 470328 to 459330 ~~via~~ to
452338 ~~to~~ ~~down~~ upstream to 458335

Sulitjelma map

88 463328

Green Phyllite - some
copper ore was found
here earlier, but not
enough to warrant
economic exploitation.

No sample could be
found of the ore today.

Good exposure in
Phyllites till leaving ridge

89 456328

No exposure -
note pebbles of
graphite schist,
green phyllite, and
a sandy grey schistose
granitic rock on top

of mound, but NO rock
in place. -

90

458 330

S34° to 240

on poor S
surface.

No exposure across 2
gullies till.

A light grey medium
grained quartzite, with
a & very poorly developed
schistosity. Small folds/
channellations on an S surface
and a muscovite and biotite
also present. Stains brown
weathering.

Qty 70%

Musc 20% up to 2m

Bio 10% up to 1m

Through woods with no exposure

91 452 338

S20° to 288°

A fine grained grey-brown
weathering fissile grey
schist. Small specks of
biotite in a fairly uniform
grey matrix. This outcrop
is about 100 ft in width,
and underlain by more
grey schists.

92 454338

S.

A more quartzitic rock
akin to 90 in weathering
and structure comes in
after good exposure in fissile
grey schist.

93 455337

S 35° to 290°

Main coarse green schist
has

Boundary with

456
94 454336

Green volcanic schist.

S 25° to 280°

have.

500
m.

Coarse green schist
95-

~~green schist~~

volcanic green schist

94

95

458, 335

Coarse green schist.
amphibolite -
perhaps some
schistosity

30

June 29th.

Sulphelma way

96 484 385

S34° to 325°

↓
100 yds up

S32° to 330

Fold axis dips

~~0° to 70°~~

10° to 14°

Fine
Grey calc schist / phyllites
- fissile. Phyllite / calc
schist in bands, calc schist
predominates higher up.

Fissile grey phyllite

Note a greenish facies - not
the green phyllite though.

Considerable pyrite here.
cubes up to 10 mm in
rock. The rock here in places
is separated into black /
white bands (2 mm max)
with muscovite.

Black - biotite 40

White quartz 30%

Plsp 30%

calcite 10%

pyrite 9%

97 486385

S 346 310°



20yds

Above this is a rock
similar to 92

Quartzitic, medium grained
poor reaction to acid -
only round edges where
brown stain is a little
fine calcite. Probably lies
in with 95 acid volcanic

20yds further up,
a green phyllitic rock
with pyrite - up to 10mm
Green Phyllite

98 487387

acid volcanic

~~quartzite~~ ^{white} - greyish with
quartz dark up to 2mm
biotite 0.5mm Plsp ² clear

shiny lathes 1mm, rusted out
pyrite 3mm. Also amygdaloids

Quartz 70%

Biotite 10%

Pyrite 10%

No reaction to HCl.

↓
40 yds up hill

544° 6300°

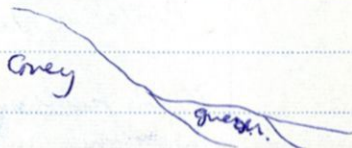
Green Phyllite outcrops

Upto 15-20% small
pyrite in pockets - cubes
1mm +

99 488 384

Grey phyllite, and
very much of it - also
tension gashes of quartz.

540° 6300°



↓
30 yds

Green Schist

100

493383

S25° to 310°

After crossing green schists
back into greenish phyllite
at this station. Small
amounts of pyrites.

Just down in stream, a
dirty grey to blue ~~rock~~
(schist) with pyrite
cubes 1 mm to ~~1 mm~~^{40 mm}
magnetite octahedra

Magnetite 20%

Pyrite 5-10%

Increases Eastward,
over about 100 yds

to

Magnetite 20-25%

Pyrite 15%

30 yds further on into
greenstone - no magnetite
nor pyrite.

100
Bluestone M.P.
Bluestone M.P.
10 ft Greenstone
Bluestone M.P.
Dark Greenstone
Grey schist
Grey phyllite
Graphite Schist



101 497382
 5300 to 3220

Dark grey graphitic schist
 with very occasional magnetite
 and pyrite as inclusions.

Note also quartz vein + sh.
 slightly brecciated edges.

vein - 3 ft thick - concordant
 at with dip.

↓
 40 yds

One green phyllite/schist bands
 with few small thin
 pyrite - Greenstone

02 20 yds -
 PEC
 IF
 ↓
 10 yds

Magnetite 30% in grey
 phyllitic rock, just as
 stream enters narrow gap.

↓
10 yds
From 102

In a schistose greenstone
with occasional pyrite
4 mm or up
to 5% magnetite

103

Grey platy rock
little to no ore

S30° to 32°

After 5 yds, magnetite
10% in blue/green
streaked schistose platy rock,
going into a definite
greenstone

←
↓
5 yds

Bluestone - with only a
little magnetite, in meaning
to about 15% 5 yards
from greenstone/bluestone
contact. Bluestone tends to
greenish in about 10 yds,
less magnetite, a little
pyrite - 5% each perhaps.

↓
5yds

Another blue band -
magnetite to 75% - 20%
4 mm.

104
SPEC 12F

Densely streaked &
banded grey schists
25% to 30% magnetite

after about 50 yds into
a less rock rock & greenstone.

105 ↓
30yds
490385
105
↓
40yds
↓

Much green/brown mineralization
on surface of greenstone
+ pyrite 70%

Quartzite facies here also -
Malachite stain on
overhanging roof?

Then in grey schists
with a - one, after
20 yds becoming greener

↓
70 yds

↓
80 yds

The greener phyllites
are about 40 yds
interbedded with
then back in grey phyllite

Green phyllites

} None
one.

Grey phyllite again

Sulphelma
Map

July 1st

477385 → 484388 →

486387 → 491396 →

499391 → 488385 → 477385

106 485386

S 50° to 320°

Boundary between
a brown weathering
serripetite schist
(bright) fine grained, and
and non calc, and
a fine to nearly glassy
quartzitic rock, volcanic?

Direction of
aplite
dips 70° to
240°

Note - 100 ft up an
aplitic vein, very rusty
weathering. 10 feet wide
Cutting dip - much jointed
parallel to trend of vein.

Across stream a brown
scar trench in a schistose
rock - with gully vein/boudins
18" x 3 feet - much green
& brown mineralization -
haematite & pyrite - fair
amount.

~~Cross~~ near Up hillside
to a trench blasted in
mineralized schist &
haematite, pyrite
& chalcopyrite. Also
white feldspar quartz
sericite schist in thin
bands.

50 yds higher & to N
Green Phyllite - the much
quartz streaked.

Cross marks Reestwards

107

486387

Fold axis
in phyllite

dips 15° to 40°



pitted line
shows erosion
surface?

Cliff with waterfall

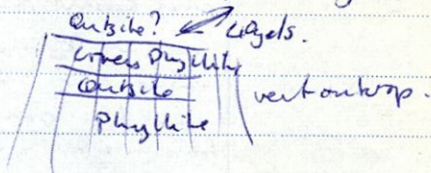
~~Chert~~
Grey Phyllite Fold Fac.
Quartzite $\uparrow$ 8 ft.
Phyllitic
Schist.

Note gully in fold axis
of Grey Phyllite

Grey Phyllite -
Fine grained grey,
phyllitic surfaces,
brown stain on
surfaces. Little
to no gully save for
in fold axis

Quartzite Medium
to fine grained, bands,
grey/less grey bands
white ~~10%~~ 15%
20%, Only 70%
others 10%

5700 to 140.
Green phyllite

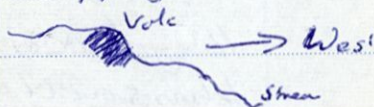


40 yds east of
this small cliff,
green phyllite
dips 70° to 140° -
could this be an outcrop?
- doesn't look it.

Pans north in good
to fair exposure -
more green phyllite -
then crossing small mass
- quartzite - another
small mass, the
acid volcanic again
appears semi-

Fine grey glassy matrix
with blebs of quartz 4 mm
and small porphy of feldsp
in matrix

Further on this vale. lightes
- shows brown stains
and some small pyrites
This volcanic follows
along the obvious ridge,
below the ground is flat
to another crest before
dropping into stream



The volcanic corresponds to
ward the Kong Oscar mine

Gneiss schist at Kong
Oscar shows mineralization
on surface - little ore. Is
~~at base?~~ This schist only
a lens. Also a white
quartzite. Ore found in ^{acid} volcanics
- pyrite massive but fine,
and a little chalcocopyrite

Upstream (W)
magnetite in green phyllite

200 yds up
from river

Good exposure following
up stream bed in the
Green Phyllite
- Note a few streaks of
pyrites concordant with S

Green
Phyllite

Green Phyllite - many quartz
streaks, bands and boudins
in a fine grained green
phyllitic rock. Streaked in
bands of approx $\frac{1}{2}$ " units
max. Note small
crenellations on surface.
Fissile, note also fine foliated
bands

Phyllite /
Chlorite 50%

Biotite 20%

Quartz 15% bands

Feldsp. 5%

Others 5%

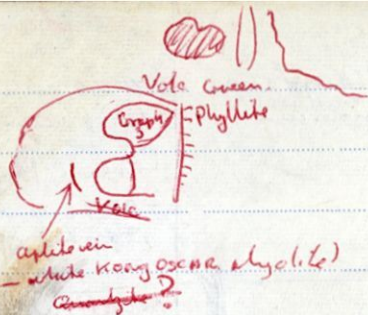
107

300 yds
upstream from
King Oscar.

498393

Green Phyllite -

Magnetite appears in
Green Phyllite - 5%, 3 mm
+ a little pyrite



Sulitjelma Map

July 2nd.

Weather thoroughly unpleasant
after 1pm.

1000

Just below 98, the
grey acid volcanic
outcrops - 60 yds down.

- Note - 98 is not

a quartzite - the fine
feldspar lathes indicate
a volcanic - this
is the acid vol. !

108

100 yds over crest, good in Green.

523° to 310°

Up to zone of mineralization

1mm to 4mm 3% + some
magnetite 0.5 to 2mm 5%

[illegible]

Not far from 102 - ~~70 yds~~ -
3 ft graphite schist.

10 yds back eastward?

50 yds east of 101 boundary
between graphite schist and
a quartz streaked green phyllite.

Rain stopped play - although good
exposure to -

Dark gray brown weathering
fissile graphite schist.

Just after small rise a
brown weathering fine grained
very dense gray rock
outcrops - showing olive yellow -
weathering internally just
below surface and along cracks.
- an olive rock.

Late in graphite
schist.

 sample.
Bright green
graphite.

Green Phyllite
grading more
marly like

109

i) S12° to 005°

ii) S15° to 350°

501378

(Filthy
weather)

110

S20 to 330°

505378

at end of lake - green
phyllites.

111

S140 to 358°

~~111 to 980~~

~~547375~~

514377

Graphite schist after
crossing dark grey semi
graphitic schist - much
quartz vein, and quartz
between S planes.

Cross stream, part

~~Dark grey schist~~

Lake

~~Crystalline schist~~

Dark grey
schist (bio porphs)

end of lake. The dark
grey semi graphitic schist
- much quartz - also less
fissile than graphite S.
also with biotite porphyroblast
- this should be considered
a facies of the graphite schist
- together with the
dark grey ~~bio~~ granitic
semi graphite S below

111 - at times they are
indistinguishable.

112

S34°660°

14121980

517375

A brown weathering greenish
schist showing thin green /
white bands in microfolds
- calcareous - 15%.

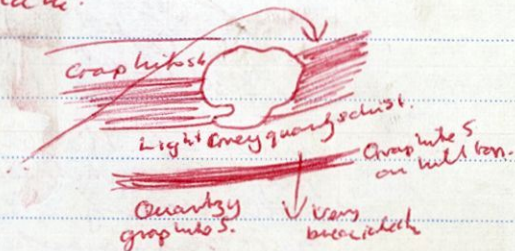
Fine dark green mineral 50% 50%
quartz / feldsp 30% 30%
calcite et al 20%

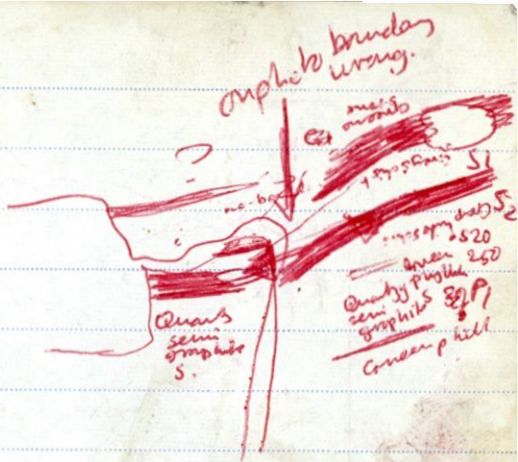
about 30ft of this before
back into quartz greenstone.

RAINONME
NOT
HONEY
FOR I

AM A
SUGARCHILD

Heading back west across
lake.





amphibolite # 1. with halite

S1 Gneiss schist 100 ft

amphibolite # 2 from top of
the formation
for 100 ft.

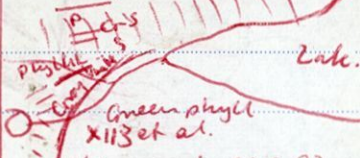
S2 Quartzite gneiss for 300 ft?

Sample 13F — P1 Green phyllite ?

Biotsch porph. 10% 3mm — P2 Green amphibolite schist — ~~amphibolite~~



Graphite S



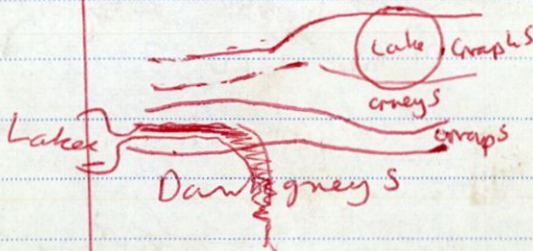
Green phyllite P3

P2 - 100ft?

Green Phyllite width of hill top P3 P1

Quartzite schist - from $\frac{1}{2}$ way up to just beyond crest

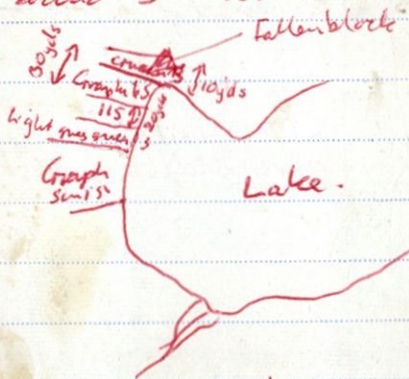
Note before 112



Note - numerous (4) ~~quartzite~~ rilled fold
cones exposed?



115 SPECIMEN Just past graphite schist
14 F boundary - acid volcanic?



BLOODY WEATHER!

150
yds

~~116~~
Coneptite schist &

Coneptite schist

much olivine rock
in small dykes?

Graphs trend NS?

Graphs

Lake

116

550 to 0408

Reversal of dip on

Down weathering fissile (very
grey phyllitic schist.

117

320 to 320°

ultra
shale
probably

graphite



200 yds

117 layers

117
Chapin

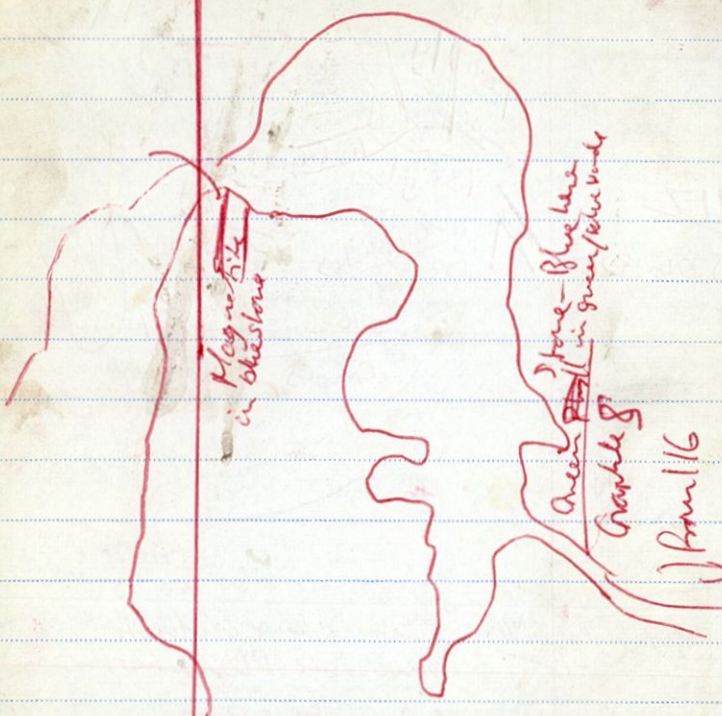
Small lake

116

101

Graphite

NB. Muscovite & chlorite
muscovite Phyllites
- Sjausta group.



Magnetite
in chertstone

Stone-Bluestone
Green ~~stone~~ in green/blue water

Graphite

Jan 16

Magnetite in chert/
phyllite banded bluestone
20%

Green schist on other
side of stream - quartz - 50%

July 3rd.

Sulitjelma
Map.

Along lakeshore, SE side, by row boat. Weather good, mosquitoes not so good.

118 .
S15 to 275°
A ~~fine gr~~ grey brown weathering fine grained grey fissile schist quartz schist compact, non calcareous.

At Glamy texture - possibly acid volcanic - porphy of feldspar ?? above 2 ft up a massive fine grained greenish rock - heavy.

119

A ~~fine grained~~ dark greenish brown weathering fine grained dark greenish massive with poor schistosity rock. It has small few biotite porph. Massive dark green volc. schist?

Following ~~A~~ road S strike.

As 119

120

- same as 120 uphill "

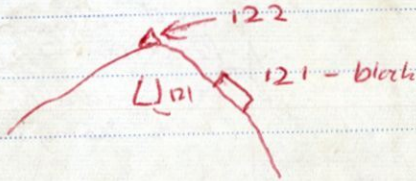
S45° to 32.2°

outcrops about 100 ft higher
up - loose boulders in
scree - note biotite porphs
2000 3 mm - also somewhat
glassy - not basic - ~~too~~ 500
yds along shore - the same

Specs.

121, 122

Neither 122 nor 121
were obviously in place
but as shown



121 - Brown weathering
quartz semipelite grey
to grey green fissile
schist - ~~no~~ calcareous

with ~~plates~~ of aggregated
plates of biotite. and
thin occasional streaks
of quartz

122 - A hard quartz, massive
or medium grained greenish
rock with much biotite
30%, quartz, feldspar and amphibole
probably chlorite forming
a fairly fine matrix. Non
calcareous. May well be
in place - as there are
other outcrops.

122 probably caps hill -
underlain by 121?

123

A fairly massive bedded
520° to 320°
greenish weathering
quartz green schist.

50%
quartz 60%
chlorite ~~about~~ 50% 30% - biotite 20%
fairly non calcareous. no muscovite
~~also~~ not bed

124

S40° to 300°

A grey unweathering
grey schist, the weathered
edges reaching strongly to
H.C. - with thin 1 mm
quartz sheaths between
areas of ~~biotite~~ fine grained
biotite and a little chlorit /
phylite - ~~small~~

Note also weathering
pitting out lines of weakness
along S, but still leaving
rock massive

125

S47° to 305°

Brown grey weathering
fairly fissile quartz biotite
muscovite calc schist.

- poorly calcareous but
noticeable. Fine to medium
grained - 0.5 mm.

Weathering fairly markedly
in outcrop - lines of weathering
along S.

July 6th.

Cross Balvatin to hut
at 381231

July 7th.

Balvatin
map

381231 →

126

S30° to 290°

381231

↓
18 yds

South

S15° to 190°

S15° to 220°

a flaggy grey to grey brown biotite
mica schist - also fine
quartz/calcite? Semi pelitic
V. Fennell?

Quartz bands up to 2ft x 9 inches

Small garnet zones, about 20%

at this point brown staining
band above garnetiferous schist

4ft? Thin serrate rich and
quartz rich bands in this
mucky band.

North 40 yds

S150 to 275°



1/2 in.

1/2

1/2

1/2

100 yds along
Southwards

S20 to 237

very rusty

A graphitic band with
thin grey biotite bands 4"

~~10~~ 15 feet. - also
"sulphurous weathering"

2 ft massive band in middle
small garnets 2%.

(brown weathering biotite rich.)
+ muscovite bandings

In turn overlain by
white non-gametiferous
muscovite schist

Strong

Surface
lineation

21° to 260°

↓
80yds
South.

Becoming a medium grained
garnet biotite schist
overlying the muscovites.
Red garnets 10 mm max
10% Also light green
amphibole 3-4 mm 10%.
(in bands)

127

↓
Following greyish schist
up hill rid, poor exposure
all small outcrop - pink 30% bio
in thin coarse grained
white quartzitic schist.
This overlies the brown
biotite schist from the
last exposure (or is within it)

↓
20yds N. and uphill
an outcrop of dark v. fine
grained amphibolite

↓
The white coarse mica
quartzitic schist outcrops uphill
80yds, and slightly south of
amphibolite

S 50° 225

S70° to 185°

Very darkful if in place -
a platy ~~biotite~~ ~~brown~~ weathering
rusty
biotite garnet? coarse schist.

S20° to ~~180°~~
175°

↓
15 yds up.

Same 50 yds upstream -

- No exp. hill

Just above - white
muscovite schist in the platy
Bio garnet schist?
No exp. hill

S30° to 240°

↓
40 yds

Straight to hill

Rusty
Platy, biotite garnet coarse
schist

Cross small stream - biotite? and
No exp. hill

128

Fire dark amphib. Shearal.

↓

N 120 yds

S20° to 110°

Light muscovite schist as
seen on beach

little exposure ~~the~~ ~~as~~
marry found uphill
for 120 yds and a little north

up hill, 120 yds
slightly
north. 129

Brown staining graphitic
schist.

S58° to 260

130

Dark fine fine weathering
grey biotite ~~samuelite~~
schist. ~~Samarite~~? Fumene

S10/000

S35/210

- across stream above a calc. rich
bed in schists - 6 ft
in mshy weathering schists

↓
upstream
200 yds

S40 to 265

Brown weathering muscovite bio
schist phyllitic? schist



where
stream forks
S29° to 246

Fine dark grey biotite schist

131

S24° to 250°

Fine grained fine banded
amphibolite - hill covered
by a brown weathering
schist coarse quartz garnet

132

S. 150° to 270°

amphibole bichite muscovite
schist - across outcrop of
similar material - exposure
is not too good.

Brown weathering platy bichite
muscovite garnet schist,

30 yds
across

fold axis

300° to 274°

From here to stream outlet
following - leaving cliff with
a coarse bio. musc. staurolite??
schist.

133

30° to 180°

In a green amphib. at lake outlet,
pyrite 5% up to 5 mm.

Just over bank, a grey
quartzite

134

S 20° to 200°

135

Rusted
White mica schist with
rusted? pyrite? inclusions

5-10% Thin band,
overlain apparently by
graphite schist

530° to 200°

July 8th.

Bahratn
map.

from hut at 381231 along
~~shore~~ shore till, 393239
to and back to

136

Brown weathering, Turmland schist

55° to 62°

↓ 200 yds

Round corner to lakeshore proper from
little inlet - poor to no exposure

525° to 255°

Typical Turmland schist

Brown weathering, fine grey brown
biotite muscovite schist

Here flaggy. Note also quartz
lending r. coarser bands

↓
200 yds
in good
exposure,
heading E

S10° to 225°

40 yds along

Poldax
6° to 178°

Just beyond into black
gneiss 3 mm 20% amphibole be
was muscovite schist
- thin band

Grey brown fine bio musc phyll
schist, small folds - bedding (qu)



S42° to 53°

10 yards road, top
sheep pens



Then back into flaggy schist

No exposure here

137

S24° to 262°
(39323a)

Purty weathering fine
grained fissile grey
bic. musc schist.

Quartz banding - 12" - forming
boundary with graphitic
~~schist~~ dark green
semi-graphitic
schist

150
feet
up
↓

is rusty weathering with
yellow greenish mineralization
sheaves.

S4° to 270°

Quartz banding 4 ft x 12 ft
in S slane - then more phyllitic
rusty weathering grey schist

70 feet
↓

S near horizontal.

38100 ft. up.
↓

Grey flaggy schist now
outcropping.

S8° to 250°

(394234)

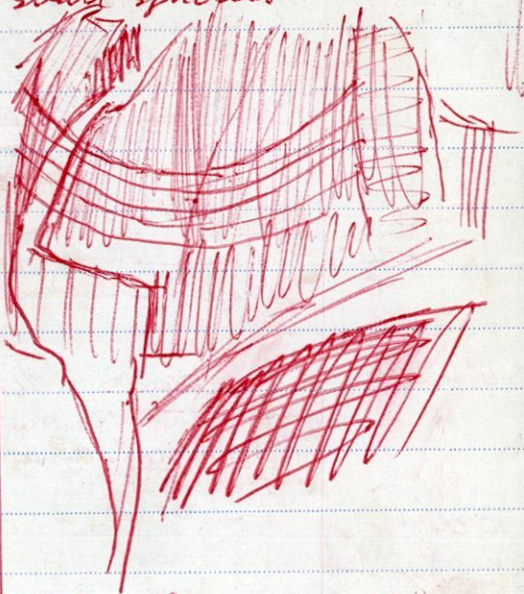
↓ 120 ft

S25° to 280°

As above

good exp.

Note at main waterfalls
small syncline.



Also here gneiss/joints
Flags 3mm 20%

S 18° to 274°

Rusty weathering band
comes in again at top of
falls - not here graphically.
also yellow green
mineralization

122A

 $875^{\circ} 252^{\circ}$

Surface weathering
- small tilted
dikes

9061550

The amphibole in this schist?
Peculiar bar about 50 ft. has

Shiny grey ^{fine} muscivore
bristly phyllanth - dull
grey warbling. - Parnes

into a brown weathering
grey siltstone just above.
then to station 130 of July
6th.

Frei Bio nurse. schist.

१६५

~~1000~~ 2" Amplitude by 1000 cycles

18. "Für die Muse
hissi to zanni achter schiss"

12th 11/11/11 Campsite - Ruck
at dusk very

Brown weathering
grey slightly

see below -
is better!

Naar

~~Ständige Sekret.~~

Aug 4 81

Schicht 1 1/2 ft

Amplitude 1 ft

Don't know Scher's! 6 ft?

6 ft.

Phy Ute

140

836

~~Amphibolite~~
~~Plagioclase~~ ~~with amphibolite or~~
~~chlorite~~ ~~Complutite rock + 50%~~
~~pyrite.~~

2 ft. ↑ quartzite clastic
~~amphibolite~~ ~~rock.~~

20 ft. ↓ Rusky schists.
 (Craptite ??)

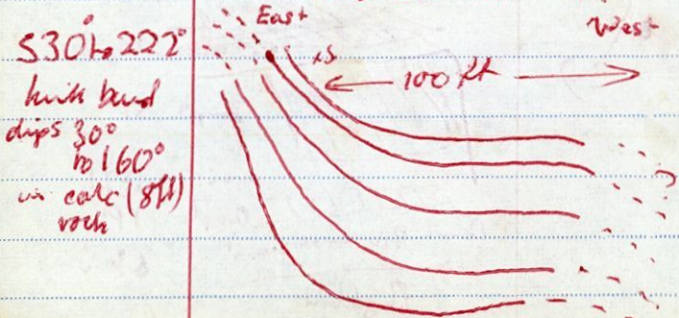
Calc rock 8 ft

Band 2: 3 mm schist 6 feet.
 calc. rock band 6"

Rusky weathering grey phyllite 6 ft.

rust brown weathering
Craptite schist 2 ft
 8 ft amph.

Note structure

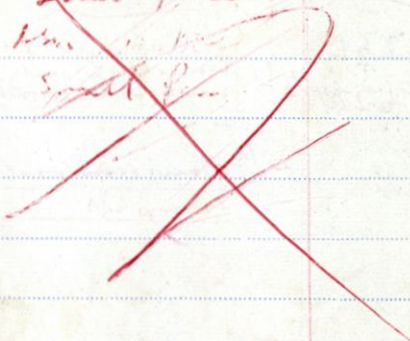


Capitan's signature at
waterfall perhaps.

Small fault 4 miles in

W. of ...

Small ...



~~Amphibolite~~

1.5 miles S.E. of Fairland

Blue gray Quartzite Amphibolite 15th

Small fault (2 ft. ...)

runs in this ... valley

100 yds. ... 140, ...

West, ... words

320°

141

394234

S 50° 6270° 30 ft

top-lenticon.

↑ white weathering
coarse platy
muscovite chlorite schist.

20 ft. Oreg. Fossiliferous schist.
amp. 4.5.

SPEC.

16F

141 - a light weathering
coarse platy muscovite chlorite?
biotite fuchsite calcite?
schist interbedded
and interbedded with
thin streaked amphibolite/
biotite schist and dark
muscovite biotite schists.

Musc 30%

Bio 30%

Fuch. 30%

Chlorite 10%.

No pyrite or ore mineral.

Hill top capped by thin 15 ft
amphibolite

+ calc with muscovite schist
chlorite schist


calc schist
Fault.
calc schist

142

Outcrop as follows

Garnet Amphibolite calc schist &
Calc - as at 14177

Rusty ~~muscovite~~ ~~pyroxene~~ ~~garnet~~ ~~schist~~ ^{near hill}
Sheared amphibolite.

Soft

6 ft?

lower
bedding
unseen

Rusty 'Sulphurous' Graphitic schist.
~~Amphibolite~~

Medicine

Amphibolite garnet bio
musc schist - slightly
pinkish to colour akin to
17F & 18F

Amph

Schist

Amphibolite

Schist in floor? No!

Lake
Two distinct gold
phyllites?

Stream

Schist?

LAKE

Phyllite?

Amphibolite

Amphib

Zone of rusty fine
white mica across - white
very very rusty! One body
believe it or not! H.W.O.

143

Schist
Sheared
Amphibolite

143

538°6265°
SPECIMEN
15F

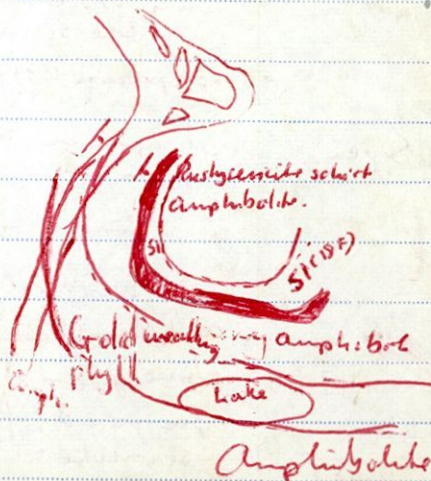
The ore rock. Bed about
10ft of that. Rusts very
red brown - a medium
grain sericite schist, more
quartz when pyrites present -
also a little cerussite. Note
also green CuCO_3 ?

Pyrites 30%

~~Green CuCO_3 10%?~~

East
Cross stream South - fall line
South bank - dip 45° to
270 approx.

Recess West - picked up
rusty sericite schist.



^{Rusty}
Following the cross
underlying S1 and
overlying amphibolite -
lost in lack of exposure.

Found again at

14.14

Rusty weathering poor
splintered exposure.

S 48° to 236°

50% pyrite of that.

North 20 yds down quarry
note - same again - 5-
10% pyrite. Note - pyrite
only visible sideways
into the schistosity.

- exposure lost in marsh.

Spec.

S1 appears much more
green ^{po}

~~Here~~ cross more!

S1 is exposed in
anticline, symmetrical
above ground - below
fragments of pyrite.
sericite schist -

Axis 175°

SE into

47° to 255°

Maybe i. - i. - rite but
marked ant. - purple occurs
with quartz rich band in this
rock.

52 (17F)
51 (18F)
one 15F
amph.

July 9th.

Sintigelma Map

145

535° to 302°

464 374

coarse to medium glassy blue
green calc. - from lake, bush,
then grey brown weath. quartz
calc. becomes lighter, glassier
and greenish blue, then into
145 similar to 122

100 yds

across small lake - as
119 - dark green fine gravel

Note - similar rubble in
floor of little valley.

- coarser sand near 150 yds

E - probably a basic
intrusive - amphibole - then
back into 119 type for a few
yards, and then into
a dark green amygdaloidal
very fine matrix. fsp, quartz, bio
slightly orientated

146 →

433371

Dark green matrix 70%
Amygdale brown 3 in 20%
Biotite 0.5 mm 10%

matrix fsp
quartz
bio
chlor

120 yds on - finer
darker with a few 5% - 10%
perthite cubes 2 mm. Dark
green ~~fsp~~ porph.

calc in vesicles? 20%

rich in fine
biotite or amphib + hard
to say

147

526° to 320°

463 366

- As 119 again - a little
further back has ^{conspicuous} pyrites
and calcite - are all
there just a facies??

- across valley part
small lake - greenstone.
with little blue bands

- just 50 feet above on
hill crest - the light
green glassy & biotite
122 comes in - biotite
aggregates up to 2mm -
then to 119 type overlooking
lake -

550° to 323°

464 364

boundary between 119
type and a grey green
quartz streaked biotite
schist - calcareous - as
123?

30 yds down a fine
graphitic schist

119 type

123 type ↑ 70 ft

Graphite Schist 20-30 ft

Noncalc brown
weathering grey
musc bio chlor schist.

No exhumed rocks.

Graphite phyllite
but not in place

- calc grey phyllite

at N end and
uphill of long lake

- up hillside above lake
and a green phyllite
in place ???

hill top behind lake - to
E - is of green phyllite

Over hill
top in wide
crack

Over

148

474 359

Greenstone / Phyllite
boundary,

Moguesstone with
about 10 - 15% magnetite.
The phyllite may have
the odd cubes of synites.
Note also thin bands
of 60% synites ^{60% thin} concordant
with S - metacarbonate
though - bands about 1" wide
if that. Zone about
50 yds wide?

100 yds
Grey green
↓
Grey

- into a green ~~metacarbonate~~ / phyllite.
Then to a grey phyllite.
sub (quartz) - grey to
green, biotite purplish
2m. 20-30%.

Down hillside across smallest
stream into lake, at

149

476 357

S20° to 290°

Fine Grey metacarbonate
Grey phyllite with
quartz quartz / calcite bands
also in bands with
Musc. 50% / Bio purplish 20%
Calcite 25% - at 90° nearly to
Quartz 5% S!
Bio 20%

↓
32 yds

Just below above the
north end of the lake,
a graphitic schist

Back at

station 68

S23° to 355°

↓
300 yds up
from 68

S45° to 106°

so ^{was} ~~300~~ yds ↓

from

200 yds ↓

greenish bluish grey
Phyllite

Phosphate

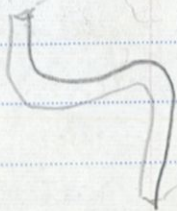
Greenstone

Just across

Blue/Green zone

boundary

S90° to 330°



On hill top, very fine
grained Magnetite, about
5% in bluish greenstone.
- also amphibole 3mm
th, epidote chlorite
Seems to move on hill
top than at eastern
edge - ~~so~~ just $\frac{1}{2}$ mile
south of station 70

Perhaps 10% - 0.5mm

Returning from edge
of scarp overlooking
stream (475347)
mag increases from 10%
to 15% to 20% - then into
bluish greenstone but a little
coarser in
+ into phyllite - no
magnetite

150
S65°W 127°
477351

Blue faces of green-stained
joint below much
amorphous epidote
chlorite in g. stone.

Cross stream at
End of lake
Green phyllite

West
↑
200 ft Graphite Phyllite Mag?
150 ft Grey phyll
50 ft Graphitoid schist

120 ft? Dark green phyllite Mag

30 ft Blue schist

↓ 5-68
line

N
→ 50 ft Phyll - little mag SB
across stream
stream

151

471358

On top of western hill past lake. - Crapelite schist

- lies above phyllite?

green.
- phyllite on far side of this hill have about 5% ^{to 10%} magnetite, 2 mm to 3 mm

- Magnetite zone seems to end at end of cliff.

350

Sirtigheim Map July 10th.

9:50 am 150°
over head 180°
8:50 - 210
4:00 dark - 210.
6 pm 2:40

Up from station 123 - no exposure same for tunnel - much brush, - at stream

152

520° to 30°

479367

Quartz Green Phyllite + few porphy of biotite 2 m

Quartz bands 3 mm. No one one is rusted out.

↓
100 ft

A bristly weathering graphitic schist, a little quartz in small places.

↓
200 ft

Grey-green phyllite -
more bristly porphyroblasts
cutting S. 2m

↓
above
waterfall

Down to rusty weathering
graphitic schist - more of a quartz
graphitic or dark grey phyllite.

Good exposure up stream all
way so far - note usual
light small 2" folds. Accen-
tation! 22° to 37°

Note quartz streaks and bands
as in green phyllites.

This area is a mess.

graph { grey { brownish
phyll { green { semi pelitic
phyll { phyllitic
schist } } } } green
schist
+ small kin
to porph's 0.5
mm

Fold axis
dips
 18° to 72°

stream

70 feet,

- This whole area is falling into the waterfall ~~from~~ about 100 ft behind

↓

Rusty to brown weathering
graphitic schist

↓

200 feet

153

532°6343

481364

Blue stone facies of greenstone
+ much chlorite on S surface
+ 15 to 20% magnetite 2mm
mass

50ft ↓ F

Green stone

No ore in
Magnetite

50ft ↓

Green phyllite

↓
East 100 ft

Blue stone + chlorite on S.

20ft ↓

Chloritic blackstone + pyrite,
cubes up to
5mm, 3%

20ft ↓

Green Phyllite + pyrite 1-2mm
5%?

20ft ↓

Oxidized Blue stone - no ore

Green phyllite

↓
200 ft

Chlorite blueschist

↓
Cross snowfield to

154

Green Phyllite

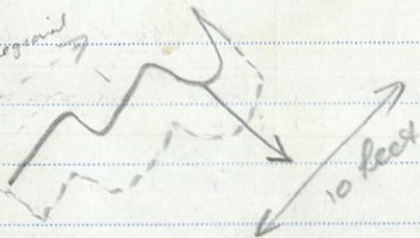
40 ft

S27° 265

↓
Clor. blues tuff / schist & perhaps
a little granite high up.
Note very much folding

483361

S. segment



Crust
esp of
CB

dips
Fold axis 24° to 40°

chlorite

G. Blueschist + 30-35%

magnetite 3-4 mm 6 mm

granites 5-10% 4 mm

155

East about 20° gets after
pyrite 10% 3 mm zone
ends. And into green
phyllite with a little
faintly fine rusted pyrite,

156

S30 to 60°

C4 85354)



Nathakit

S30 to 340°

On +20 anomaly - lurch
and a pyritic (crushed), biotite
porphyroblast cutting S' 2 mm
10%, graphite schist. Note
a little pyrite and 0.5% ha!
magnetite in green phyllite
which for urdenticles and
overlies schist.

Also a large gully between

20° into graphitic phyllite
below graphitic - staining
brown - remains of phyllite
in gully - these have pyrite

Note top of West mountain
looks very nice, excellent
exposure.

Back across W side of
valley - a graphitic
Schist forms a rusty red band

running up the West side
of the valley - to mountain
top? lies between
pyritiferous bluish chlorite phyllite
blueschist, ~~and~~ and the base of the green
phyllite proper

Heading W

Past small lake after
an overless blueschist with
epidote

in blueschist

End of small lake - fine
limonite 10%

No ore in blueschist - becoming
greener with little pyrite

157

478358

Green Phyllite, little quartz
mixed magnetite 15-20%
4 mm.

Cross stream in chloritic blueschist,
into grey phyllite for 28 yds

uphill - graphitic - higher??

- graphite schist - thin.

grey-green phyllite

- a thin graphite schist???

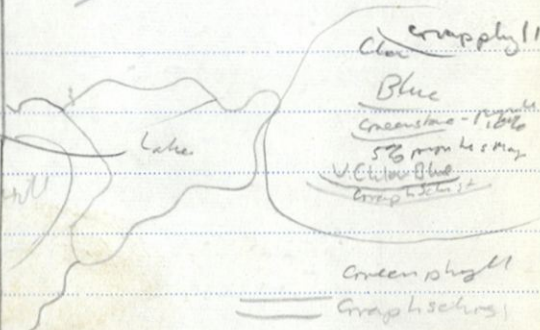
- grey-green phyllite

→ N

15P

S22° to 10°

476 382.



west

west

hill top behind this (left)
station is of green phyllite
- the classic type once again

NO EXPOSURE

159

S55° to 310°

a grey-green glassy matrix
with amphibole? aggregates
forming plates of dark

471377

green mineral - also a
little pyrites

Note →
dark
green
lath
about
3mm S /
seen.

Matrix 50% 65%
Amphibole? 25% Dark green,
green streak
Pyrite 5% 2mm
white Shemshad feldspar 15%
Schistosity, light green
weathering - could this
form greenstone ???

- as 122

Just below brown
weathering calc semi schist
schist - 121? ~~122~~ - 124
125.

Part small lake, though nice
exposure - no exposure - green
Dark blue calc schist - as 119.
- a shattered exposure.

with iron
Phyllitic / quartzite matrix

Fingering seems to be
downwards - or is this a
misinterpretation

 - much finer
fine matrix, larger
clasts -
+ small clast more
massive

- Fingering upwards

Quartz clasts
Quartzitic clasts
Greenstone / Phyllite
Quartzitic matrix 40% } 60%

Massive 4m dia bag
ascis

Green
Within Phyllite

Back to Lake at 495 403
through green phyllite

Grey Phyllite 100 yds
west of Lake.

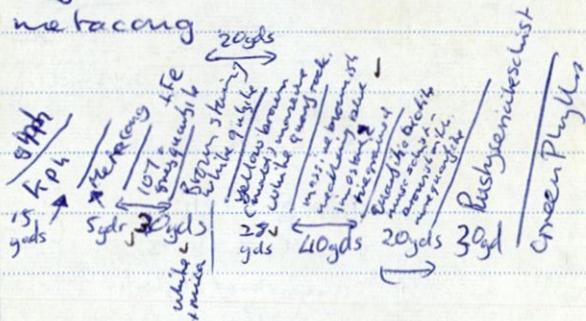
163

582° 6320

497 404

Grey Phyllite / Green Phyllite
boundary - 163 within
Green Phyllite. Grey Phyllite
here very schistose + micaceous -

15 yds inside boundary -
metacong



1 2 3 4 5 6 7

Going up cut - green phyllite
about 80 yds - then a
light yellow brown weathering
massive calc/quartz band.
(small 4" inch fault, down to E)

- sensitive to grey quartzitic
- massive to schistose -

grain size 1 mm max. or less

50

- greenstone after 20 yds, merging (quartzitic) into Greenen Phyllites after about 10 yds.

164

dips 8° to 26° - Fold axis in quartz sheared Green Phyllites - strong secondary cleavage along lines // to fold axis



200 yd?

S 48° to 306°

Graphitic schist - lower boundary indistinct to ft? but seen 15 ft.

- ~~30 yds~~ 10 yds phyllite - graphite S.

- definite seeing of strike

S 38° to 340°

on good surfaces

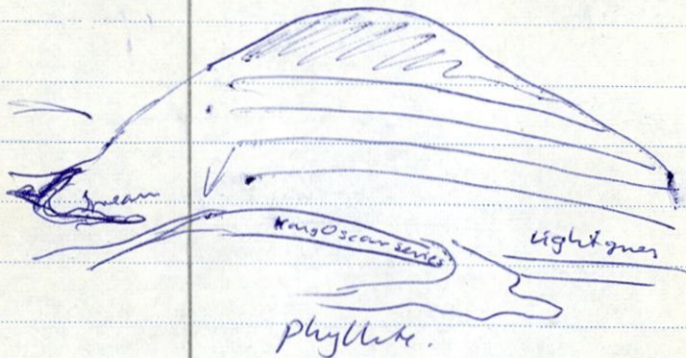
100 yds? grey chloritic
phyllitic schist,
about 100 yds wide, Green Phyllite
200-300 yds a thin rusty
graphitic schist 6 ft?
- Green phyllite 70 yds -
4 ft graphitic schist
- green phyllite
green cross visible.
- a graphitic schist
lower boundary hidden -
into green phyllite
for 40 yds, then a
dark grey quartzitic
semi graphitic phyllitic schist -
about 400 yds, then
green phyllite ~~400~~ yds
to 400 yds - coarsens to
a quartz greenstone, a
thin graphitic schist,
and folate in Green
phyllite ~~again~~.

165
517 39 2

~~late~~ act Green Phyllite

S. 38° to 316°

Run towards - 506405



166
506405

Run westward to stream
- the metaconglomerate again -
but where is rest? Not so
obvious, but

quartz rounded clasts 2-4 in
interstreaked phyllite /
quartzite - just across

stream, it becomes
quartz greenstone.

- including conglomeratic
sands - here upwards

units of 12 inches to

18 inches - rounded quartz

SPECIMEN

19F

clark & nat bairds



1 1/2 to 4 inches on average.

Back to hunt.

Sulihelina
map

July 15th

167

S35° to 290°

Draw calc schist as 124

Upstream in
graphite Sahn
kph/gfs boundary

musc - bio.

S30° to 313°



below waterfall by 150 yds

Below 153

Up to waterfall - verys leaved
area - sh. like e. hall
shew shearing - qtz veins -
conduits -

At waterfall below 153 in
'mess' area ~~12° to~~

Fold axis 12° to 60°

and just 3 ft below

12° to 72°

S35 to 300

Moving towards 154 3

at 153

S300 to 310°

across

stream N
from 153

S42° to 330°

↓ 100 yds

S30° to 330°

Green Phyllite

Green Phyllite with
a thin interbedded
graphite schist

cliff

~~~~~ Shear

(w-gs)

gr-s  
~~~~~ gr-s

168

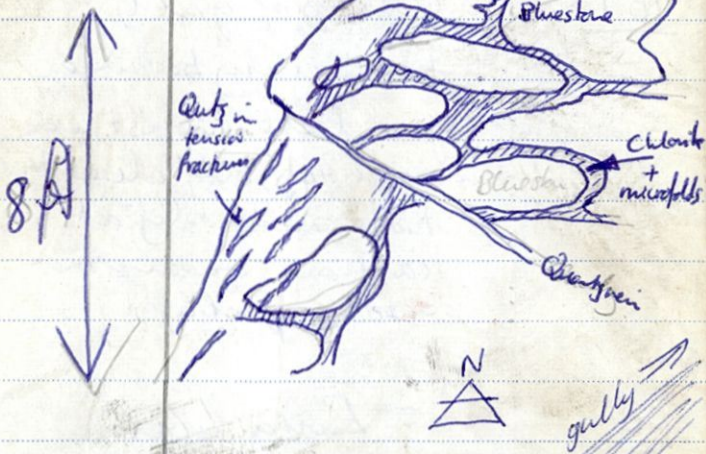
Northward east of
154 by 400 yds
- blueschist / Phyllite
boundary

Seems to follow
across gully E-W
in mountain.

58° to 298°

Moving up wide gully
- bluestone.

Up 200 ft on N side



Just above lineations
- slickensides? - almost
// to fold microfold axes
dips 40° to 118° Lineation

Fold axis higher 10° to 35°

S50°W275°

- about 250 ft
up gully

Bluestone Magnetite

169

At top of gully

boundary between
graphitic schist, more
massive (qtz), and bluestone

Note probably at
least one greenstone
across gully.

- East a little

S45°W312°

mineralized zone (qz).
Then green phyllite
boundary + 2 synclines

4 mins, little

170

S 16° to 310°

thick bed
200 yds

S 10° to 310°



S 65° to 95°

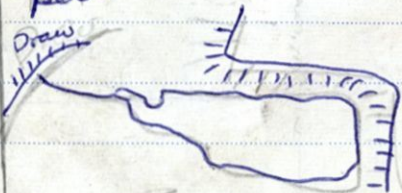
95

~~Greenstone~~ ~~plythite~~

Greenstone.

Bluestone above
greenstone.

Round west by a small
pool.



200 ft. Lata

150 yds E

S 87° to 100°

~~in green~~ ~~plythite~~

Bluestone.

171

55° to 95°

Green Phyllite,
boundary with
bluestone & argillite.
~~100 yds~~ above
70 yds

Sulphide
Map

July 16th.

172

473377

53° to 32°

Br. weathering fine
fissile b.m. ph. scale?
~~S. schist~~ quartz streaks and
bands - small
micro fold, but little folded.

Fold axes

dips 13° to 30°



↓
300 yds
upstream

kg. ph + a few qtz bands
etc. as usual

- boundary between
br. b.m.s. & kgph
not seen

Upstream
154

Fold axis
10° to 12°



in ~~D~~?
or kgph

at 154
again!

Definitely both B + mt. fine.

Far side of #20, several
(2) solar coarse gr. b.m.s.
s.e. ~~br~~ br. weathering

~~is~~ passes to a metasandstone
with bedding ~~and~~ with
v. coarse grits

173
489354

- clarks rounded up 12 mm,
orientated 11 to 5 - some
larger up to 3" gulf - of gulf.

174

497353

k.ph., dark, less gulf

↑ int up to 4 mm s

fold axis in kph just
above N bank of lake - dips
100° to 218°

175

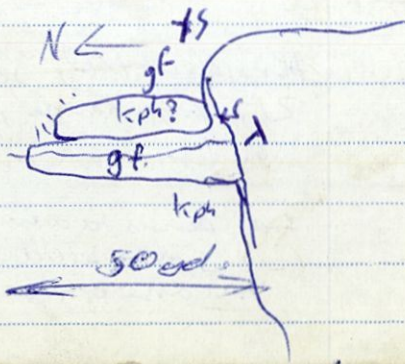
S 120° to 360°

499351

rusty weathering
gr. s. across stream below kph.

some 1 mm pbi, paring

N upstream



54° 8' to 45°

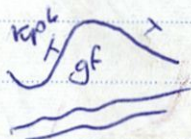
BLOODY WEATHER

176

kph over gf

534° to 89°

498 349



177

530° to 80°

5 to 10

538° to 300

497 348

525 to 335

gf. - antidiene - after
limb lost. Further

South gf./kph boundary

gf.

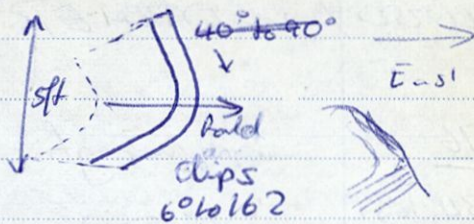


178

498347

S 40° to 90°
(i)

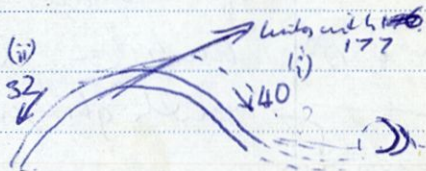
gf. structure appears NO!



Note top of hill 178

an anticline - western side
as above.

S 32° to 280°



Surface lineation (a)
dips 2° to 10°

On the western side, valley
with phyllite rubble, or
thin gf, then tph.

179

497346

kph, in light calc. rich fold
note development of ~~horn~~
dark a (Chamblesite) and a
little epidote - mass lim.

- developed into B
laterally?

10yd son a B band, mixed
pyrite 10%.

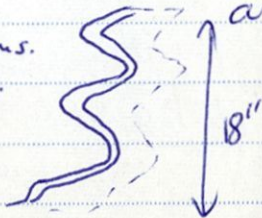
180

8 in. from
south side
of lake.

30 to 45°

Tight folds in kph + calc bands

1 mt.
5-7 mm.
20%.



axis dips 30 to 45°

↓
200 yds
at least

S 12° to 124

Passing out to a square lag,
a small outcrop in a
g weathering kph.

climbing up hill in gf,
then thin band of kph - 107 -
then gf

S 30° to 250°



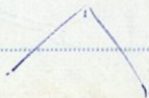
S 20° to 110°

- in kph by small lobe

181 ?

Graphite schist over
G.S.

S 45° to 100



gf
~~gf~~ all 81

Cr. s.

gf

Where the heel

kph

181?

gf

183

kph
gf

and 182.

496 340

184 495 339

520 to 125 gf

↓ 200 yds

520 to 290 kph

↓ $\frac{1}{2}$ mile

530 to 70° kph - at lake outlet

gf

400 ↓ yds

kph

200 yds ↓

gf dips to E

↓ w

100 yds

behind faulted region.

185

490 349

530 6320

kph.

♀

♂

Sulphur Map July 17th

185

465 385

From E shore of Catalerjanne to W of Kelvatnaud back to glans

Grey fine grained acid volcanic - grey glassy quartz matrix with probably very fine bio. and feldsp.

semi schistose

at shore.

grh

becomes coarser grained with fine biotite and feldspar,



just visible and
small amygdalites
20g, 3m.

~~at~~ halfway up.

at hill top a
light grey green
~~gabbro~~ gabbro fclsp
matrix with
gabbro aggregates of dark
green amphibole 20g
4mm and amygdalites
20g 3m.

Massive, hard.
passing northward, less
— seems to become
greener N also softer.
— W side, gph. 'a' increasing

S42° to 320°

186
(GA)

Northward next 150 yds
a gabbro (GA) white
fclsp and ~~2~~ dark green 'a'
SD/SD, 6m. x
— contact of gph and GA
much dark green 'a' in gph.

down below above
snowfield, gnh.

187

463 389

Down hill over stream
in forest no exp. loose?
blocks of gnh (nearly in place)
on hill top. basic see below

188

462 390

SPEC 21 F

Fine grained grey green -
qz, bi, feldsp, amph? Green streak
q. b, a

acid rock. b and just visible.

kgnh - no amphibole rich
rock - nearly amphibolite

- greening further on.

kgnh

long bog through bog

end of clearing 2 blocks
one on top of other - in place?

a brown weathering noncalc
fine fissile grey ~~bi~~ amph.

p. bi. m. s.

p. bi set across S'

189

510° to 350

459 398

pbi 40% 3mm
m 10% 1mm
- 20%
matrix, rest, fine

190
400
460399
399.

- i) ~~fine~~ brownish weathering
grey fissile fine calc
m.b.s.
- ii) about 10yds w. as 189.
is 189 in place??

- through bush for 100yds
many large boulders of
GA - probably in place here
, or a few feet out.

~~190~~ 20190
~~460400~~

GA varying from 5mm
down to 1mm a little
less - to top of hill at.

Lunch - across gpbis

back into CoA, over hill
in CoA - coming off
duggy

CoA in brown weathering
fine grained ls. & c.
g. pbi cutting S (few small),
m, s.

~~Probably~~ Also thin
long lathes 4 mm s of
a dark mineral.
amphibole? tourmaline?

- below ~~less~~ more pbi
up to 30%.

heading east in descent
exposure, bio more
rich, prob. little to no
m.

Small gully in main S/CoA
- one place - complete - 5m
development

191

~~373~~
464393

S4096330

192

467394

Boundary between gpbis
and a brown weathering
more massive grey b. calc. in
schist . m 30%

b. 40% - 1mm
calc 20% fine

fine grained grey to grey green
rest.

- only a thin band (10 ft.)

- outcrops below are all

193 471389

Medium grained GA

- greenish ls sp.

194

road hill east, grey acid
volcanic - ls sp (other 1/2 in which
also finely disseminated

SPEC 20F

m and b.

472388

July 18th

Ramsdell to Kjelvatn,
S. shore of Kjelvatn

195

At Catalerjane end
of stream to Kjelvatn -

dark green fine grained
volcanic - with some b
and a little m in
small vesicles - very slightly
vesiculated

- 15 yards down
grey glassy schistous
volcanic.

- continues down to
Kjelvatn, becoming
a little schistous
then with feldsp ~~prisms~~ phenocrysts,
as
then more schistous
with biotite platy aggregates,
then more massive
glassy w. b.

HP1

w exposure road bench
fill gch - in place? - on
point.

196

S506358

SPEC

23F

455384

Small but there is a trap
A coarse metaconglomerate
with round elongated
clasts of quartz / quartzite, but
b aggregates.

Noncalc -
clasts up to 2 inches
long axis,
fine matrix, clasts 60-70%
(50 gals - a small anterop?)
or just boulder of same?)

197

SPEC

24F

No exposure + hill
a semi-cluster to
warmer fine grained
& brown weathering
grey rock with p bi
cutting S & S my, 60%
with fine gray ch, felsq and
matrix - just
sand cover, much fine gs,
sand colour blue
instead of yellow brown

Also boulders of
CrA

- 150yds - and gals
but probably not in
place - scabbing outcrop

- ~~100~~ 150yds - another
and brown sand.

198

A brown weathering ^{psammite} coarse
~~granoid~~ varcate bmg
massive to semi schistose
p rock - grain size 2 mm.

- a fine sandstone?

199

S20° to 320°

No exposure along shore,
nor upstream till a
grey brown weathering calc m a
g & pbi semi pelitic s,
pbi cutting, 1mm, 60%.

Not phyllitic

(Typical Fimland?)

Fine dark a on S surface.
arenitized - 3mm

200

brass weathering
~~g. b.m.~~
g. a.b.m. fairly calc
semi pelitic S.
 α - dark green up to 7 mm

~
Laurinath Map.

2
Sublimatay

July 22nd

Out to 533425 to
hill 1116, to 530434
to 522435 and
back to hut.

201

to 533425

S32° to 022° Onegphyllite schist

Just above, g. kph.

after gneiss thicknesses
of well exposed kph,

a gf, 6 ft width

original bedding in bands 1" - ???

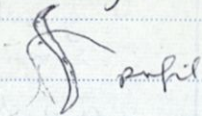
right way up, folded.

202

S26° to 334°

hill 1116

Note many thin joints
in kph, striking 30°.



203

S38° to 002°

6530 424

Green quartz above
kph, overlain by a
brown yellow weathering
white quartz? calciphyllitic
near calc. mica phyllitic
schist - then to kph,
then to g.ph. - in
good exposure.

↓
80yds

- up small scarp. a
grey streaked fine grained
m. b. g. schist - a little
calcite - an acid volcanic?

↓
50yds

- 30yds a. m. b. g. ph. s.

204

Su 529 428

↓
50yds

A grey to br. weathering
g. a 25%, 5 mm thin black, 1/100
m. b. s.

fine gr. to br. weath.
g. q. cl. (m). b. s.

↓
20yds

k. wh.
- or is it q. d. s. - fragmented
be

su 205.
528 430
548 to 20°

g. r. h. a fragment
grey glary white
weathering st. like rock.

q. d. psammite
schist
calc. g. mbs.
a.s?

20yds

↓
30yds

N, calc. g. a? mbs, with q. d.
Tertiary facies N/S,

a q. d. psammite s

frag N, to q. d. pelitic s.

- above this a bedded
grey schist - fine bands
3-4 mm, chloritic/quartzitic etc.
frag upwards most likely

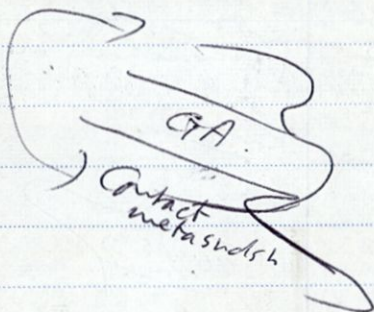
chlon

quartzitic

206.

su
524 434

tedfdrp
a gabbro - after
a contact meta-sedstn??
- or is this amphibolite



after 40-50yds GA,
a q.c.l.s, giving
to the dark. k. ph.s.
basic

↓ 20yds

k.c.l. ph.s

↓ 20yds 20

dark ~~metre~~ k. rh.s. basic

↓ 30yds

S 40° to 050°

kph

↓ 20yds

kquartzite

40
20

↓ 40yds

15 g.ph ~~60~~
↓ 15yds.

kg quartzite.

Units
showing
bedding
on large scale.

~~20~~ 10 ↓ 20yds - ~~60~~
kg. ph.

20 ↓ 20yds - ~~60~~

~~gabbroic~~ - fine green + red
amp. litholite. f.b.p.

40yds ↓

cl. metaseds.
and

Anthracite in cl. metaseds.

q. cl. m. k.s.

in banded units of 6-9"
fine upwards.

across beach. g.ph.

- becoming greener, and
highly fissile

- quartzite like green ph

207

(i) 45° to 346

a lineation

40° to 020°

(ii) 50° to 030°

522 435

and on and on
- gneiss gneiss ph
& g.s.

July 24th.

208.

S¹

Tertiary Brachydes in
massive calc brown
weathering calc? mb semi
pelite &
Poor fissility.

S²

- 300 yds higher,
a coarse fissile calc mb
semi pelite; becoming 50 yds
higher a chlorite brown
weathering ch. metasandstone

S40° to 320°

MbS²⁰⁰
200

meta
sandst.

metasandst about 150'
thick? contain by grey
q. banded m.b.s.
- all show strong folding

209 S³

S30° to 330°

The chlorite metasandstone
outcrops - a massive bedded
rock, yet schistose in hand
dip size about 2 to 3 mm streaked
& streaked.

Brown weathering Note

| | | |
|-----------|-----|------------------------------|
| ch | 15% | many |
| q | 40% | right folis, |
| b | 15% | & q. bands |
| prob calc | 30% | & banding
in fissile part |

appears bedded in units,
of about 2'-3' - coarse grading
upward to fissile, and small
units 1" in fissile, fine upwards.

underlain at foot of cliff by
S²

Possibly lake - no sign of S¹, although
a similar weathering, but
none fissile rock seen - then
a fine g. weathering kg. m.b. ph.s

S30° to 310°

- 70 yds q banded b. ph.s

S38°6334°

Halfway between lakes,
a semi-graphitic pelitic
schist. - probably also ls.

At lake after crossing
ag. volc???, semi-pelitic S
with pbi. cutting S, mbph &
q bands.

Lurch - out a more massive
pbm. cutting S. schist.

210

S46° to 328°

S15434

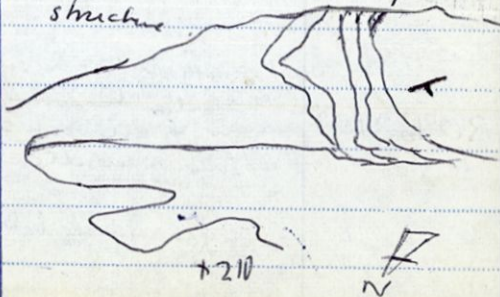
a brown weathering grey calc?
q. b. pbi/pbm schist. - pbm/s
cutting S - is the the
pbm is on surface only - just
weathered pbi?

~~40%~~ pbi/pbm 100% 4mm

Fries
upward

Note at lake. S15434

excellent exposure of
structure



- here into dark green
basic with 'a' & b?

porphs - a small lump
of a light green rhyolite
seen on S. stone of lake - in
place yes.

then dark grey pelitic S,
k basic, slightly coarser,
and a metabasaltic - green S
chow a ??

- fine schist/pelitic

fine bedded, firing up.

contact metabasalt
or amphibolite - red feldsp. ^{Amphib.} 70%
gabbro red feldsp. 'a' 10%
light green S. 'a' 70%

gabbro

gabbro

Schist - dark k basic
gabbro - dark k basic

A grey quartz gneiss cutting S
schist - perhaps acid volc.

also some 'a' porphs.
glassy quartz gneiss, 70%.

Note - finer/coarser bands
in GA - are there relics
of sedimentary structures?

Filly weather.
after GA,
a.c.l. ph. pelite

and then q.c.l. same,

Rp.

elph. pel.

coarse q.c.l. same

finer q.c.l. same

slightly coarse q.c.l. same

205 rock gph.

galexy.

563° to 352°

211

light fine quartz
green quartz glassy
rock with ~~in~~ dark green
a 15% up to 10mm in plate
aggregates

either sh. (a?!)
or a metasediment

q. a.c.l. pelite?

neither fit properly.

Beyond this the rocks
grey to a grh,
then kgabs, then a
gqb. rh.s., then
a slightly sheared
calc q. mb ph (slight) s.

212

a slightly sheared calc q. mb
phs, across stream etc.

to a gqb by lake
entirely over stream, it comes
in - it perhaps to crossens.
- up hilltop, overlooking lake,
QA

calc? gabs below +

returning - back over 208 to 209.

213

CoA. line

trh v. thin
wef ↓ fine GA - 2mm or
trh 30ft

v. fine GA - Amphibolite

trh
grey green philes

g. band b. ph.s walking
note swing down shore

S36° to 326

a green
ch. b. a? s.

- swing due
to topography



Siditjelma/
Lamivatu map.

July 25th

S45° to 007°

In grey schist (farmland)
halfway along Lamivatu - before
waterfalls

S25° to 046°

gf - just past islands
along N. shore of lake
muddy water being and
yellow-green mineral stain

lineation
3° to 23°
}

pyrite - rusted out cubes
2 - 7 mm
- limonite

214

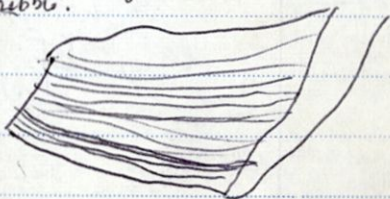
gf, rusty weathering
no mineralization

215

very rusty weathering
w. q. ~~var.~~ se.s, with
occasional greenish
stains as of malachite,
also a few rusted out
pyrite cubes.

60 ft ↑ w. q. se.s
gf
gr. bs.

same calc. bed
switch
rebbles → in gr. bs. as waterfalls



216

S 30° to 20°

rich weathering
of

foliated along strike
from lunch place

waterfall

S 33° to 36°

g. g. mb. fissile s.

boundary between
gmb-s and gf just 20 yds
along

↓ 200 yds

gf / g p mb-s boundary
in stream

S 34° to 010°

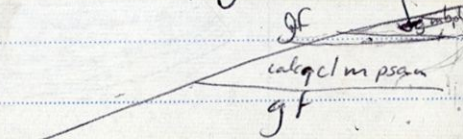


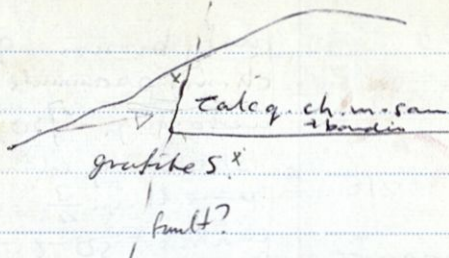
300 yds

-2-3 ft.
q. calc banding in gmb-phs
~~above gf. to below?~~ ~~above~~
below
below, calc. q. cl. in, psammite

above Rf gf

Calc
sandstone
rock





217

- gf above
banded
rock

calc. q. rock
m. rock
above
gf.

along gf
near fault?

walking uphill along
strike in gf - then into
q. calc. banded banded
g. ch. m. phs. - down cliff
face - all in band q. calc.
ch. m. psammite for 100 ft,
not seen this rock before,
then gf outcrops in stream
floor, and for several tens
of yards east, ~~below~~; the
gf boundary here is 100 to
150 ft lower at least here.

218

S 46° to 360°

gf ends after long way in
good exposure - a thin
massive dark ph. cutting
S, poorly schistose rock for
15 ft, then a

218.

rusty brown q. calc.
ch. m. psammite, perhaps
metacang. - if so, and
stretch q. clasts no
more than $\frac{3}{4}$ " in calc. q. ch.
matrix, 50-60%

SPEC25F

- 45 feet calc

100 yds

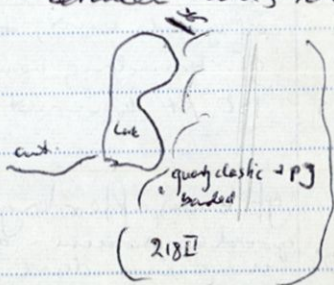
~~45~~ ft, below a q
calc. ch. m. s. psammite to
~~pelitic~~ pelitic banded schist

218(I)

- 100 yds - to a
grey calc schist

218(II)

m & b ch. prob - very fine
- seems banded - come
between hills to later



draw

with a few quartz clasts - rounded
to spherical.

- with occasional mottled py -
and sheathed green minerals



- microfolds picked out by q
ad (falsp?).

coarser & less phyl. like.
more brown? q?

highly sheathed calc?

- then post lake, gf, enriched
of pyrite - up to 10mm. ~~set~~

for 130 yds, before seeing

Enthalpy strike. and then

end a little

219

547060040

A grey blue H? + pyrite
cubes - up to 10mm - 10%

TP + crucioids??? see below

© x2

are occasional.

overlain by gf.

underlain by gf

S 26° to 018°

at stream cutting - exposure
of pyrite 10 mm
- gf, underlain by
gf. gph - no exposure
for long long way, then
a gf.

gf
lt 220
gf
gf. gph.
gf
grey acid
volc
gf
—
bmg
gf. gph.
gf 200
gkph
graph
gf 200 yds
pres

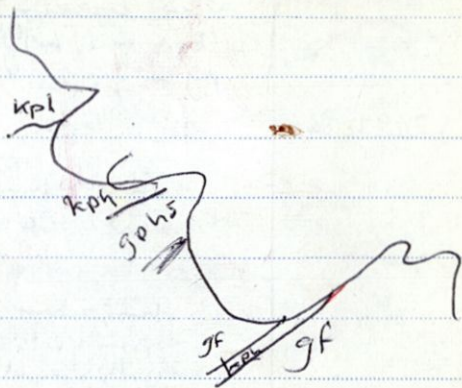
Under gf - g a grey
quartz, glassy acid volc
- pbi - 1 mm

no exposure for
200 yds.

- gf. 27 3/4' sub loph

— 300 yds, b m
quartzite tumbler.





K.S. - across pond from
last.
gf from below.

July 26th.

35 to 325

kph and stream just ^(W) after last
gf up into hNE
back into kph, & then gf

after crossing stream
kph, goes to ^{gph} + a little
py in q, - ~~not~~
to a kph.

S24° to 326

uphill and north,
about 600 to 700 ft.

- band of dr. quartzite rock
thin; about 250 feet
up in kph, then gph -
mostly weathering
- dark grey higher up,
at top - ~~below~~
- snowfield in photo -
none now,
quartzite bands / phyllite
is quartzite rock

- qtz quartzite bands in
k & gph. N ←

222

S18° to 348°



phyllite / quartzite bands
run across stream.

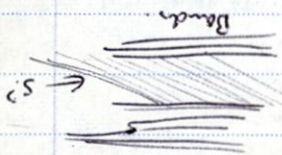
Just below line, gf,
apparent

gf, for 70 paces and

shd in bedding - 24 paces
- at water level, a
great green phyllite

sclerite rock, calc / quartz
beds, int. 2mm 5-10g
old grey phyllite bands

also traces of bedding normal



- dark grey gf of the 70 paces
to top of 1004

Inside, top. 1004/gf / 1004?
beds

across down dark grey
becoming of higher up

SPFC
297

223
S340 6014°

40 paces d. g. ph

moving across poorly
exposed glacial debris-
no snowfields for photos.

224

S38° to 354°

d g ph
draw
gt ↓ 20 paces ↓ N
d g ph.
x224

Note yellowish bands in
d. g. ph.

no exposure for 100

yds over drawing, gt -

thin weathered out py - (on photo
should be more
E)

225

by 2 lakes,

a ga br. weathering

g. quartzitic calc. fclsp?

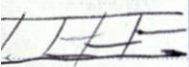
bio. quartzite schist.

fairly coarse - semi pelitic

or semi psammitic

d g ph b.
gt ~~at other side of lake~~

d g ph + yellowish
buds other side



- over draw. very much
dark grey ph.
- + emptied pyg - 4 + 7 mm
10-15%

- 200 yds probably of this
- then thin dark blue
lt - 2-6 feet, and a
green brown weathering
meta sediment series.

226

SPEC.
29F

Banded. - bottom coarser
top finer, units
of 6 inches.

- clasts of quartzite mass
size ~~3~~ ⁹ $1\frac{1}{2}$ in
a green grey
quartzitic chlorite matrix
- note numerous
small faults

~~226~~

Pebbles shelled with
 clear there to where
 - up to 2 feet - but
 probably about 20 to
 the sea. 20 yards - 30
 yards long.

- 1000: 1 thin in the

phyllitic bed.

- Suction shik just

above when. 100 ft. to

above, 40 ft.

N. bed a blue grey

schistosity with small

crinoids - 1-2 mm

①

and a big one

10000

- above 20 ft thick, N. a

g. grey to orange of
 15 feet - d. g. ph. 20 ft.

to d. g. ch. in. sand/101.

(20218) - almost kph in places

sudden

series of shik - continued

by small faults of shik

52230 to 340

SN 386360

SPEC
 FOSSIL,
 226

5406360

anand. - becomes a ls.
with q in places. - ~~70y~~

↓
70yd.

- then 218 metacong
being 100 yds N. near
pelitic, with a v rusty
dark green basic ultramic
faring a lens. 100 + 30 yds.

- then none of 218 type
rock. - phyllitic in places,
small faulting, downward

↓
dark

- then gph none of a
gph after 150 yds.
with q. calc schistous bands.

227.

(i) 47° to 358
bold axes
dips 42° to 030°

(ii) 34° to 358

down hill below a small
lake.

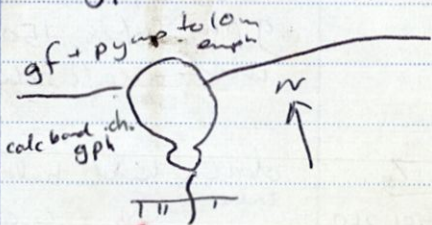


- 4 quartz veins
- upto 10-15 ft
thick in
the dark g-ph
(yellowish
weathering)

x 227

veins follow Strike & S

gf after 3rd vein
 - lighting to dgph
 - up cliff in dgph,
 becoming calc. q. ch. m.
 psam. schist, 40ft,
 a thin gf,
 a gph, fairly dark
 and a schistose blue
 lt with calc veins and
 small py - 2 in - 30ft,
 then a calc banded
 ch. gph. close to later



Note g. veining and
 contact netting of gf
 to bluish gph

big - then to d.g.p.h. - to
fissile q.ch.ph.s.

228.

46° 60' 20"

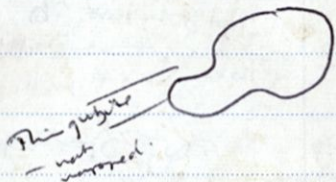
Above a waterfall above
lake g.ph. with

ph. calc. q? ch. m. schists -

- reminiscent of Fumad s. -

marine bands & fine gph.

continuing N



glacier lake



gph + much

7-10 mm py. ~~py.~~ ?

20-30%

30F

30ft bed

white q. rh? s.
~~below~~

50 ft, overlain by
kgph

50 feet
gt in stream bed

229

Halfway up the bloody
mountain - rusty band

- a garnet? b. g. s, slaggy
- amphibolite? texture

31F

below 229, pink matrix

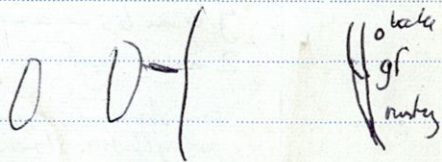


230

32F

1 mile? below big waterfall,
hillsides give to
streaked fine amphibolite
containing thin grey
rusty weathering g. sch.
quartz schist, poor in
fine disseminated pyrite

himalayas small black
garnet, 2mm, 20% 100%
below amphibolite
opposite island



July 27.

bedded
Above 207, quartzitic borders.
gnh. v. glauc. pbi

followed by 30 yd g.s.

then fine grained GA - grain
size 2mm, across sunfield

followed by 50 yd s. band.

coarse GA; coarse d. k. v. v.
20 yds, GA. med. grain

this with 5 yds, after 10 GA

after the GtA, light kh,
and then g a mbs. - volcanic
a

streaked calc g mbs
followed by a non streaked
g g mbs - argillites
2 mm, volc. -

in stream, grey ^{ch. b} green
phyllitic streaked s

walking S along kph (gph),
small lense of q. ite

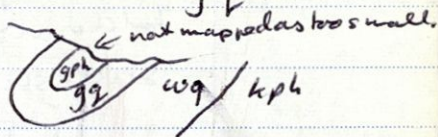
231

GA
gpl
w.g.s
g kph.

In kph. calc bands.

- (i) k q.s, whitening,
b increases, g q. after
35 yds (paved)

12 paces to gph, probably
folded into ^{brown marks.} gq.



fold across dips
30° to 061°

13 paces to sheeted gph.

S 26° to 342°

(ii) - 15 paces to Crt, with
a glassy q. k. ph. s at
contact - about 3 yds?

20 yards down, back W to
kph, across gf, with (iii)

br weath. g. q, q. ph. ^{br weath.} g. q. (fold)

and the greenish white
weath. g. q. (i) gite,
showing brown bands.

also finer grained than the
br. weath. g. q. gite; + ch. b.
the other why b.?

the br. tends to be sheeted
q. m. b.

about 100 yards S,
the b.q.itc / g.ph. / b.q.itc
fold out,
successor

k.ph.
k.w.g.q.itc.
calc
banded
q.itc. → br. gbanded q.itc
w to bl.it
g.ph.

Two hills of GA (lies
in g.ph, with S?)
before lake.

from lake, w, successor
g. calc. in fine q. little b
s. light br. weath

grey thin phyllite

a brown weath. g. q. b.s,
(g. rh. s.)

light br. lighter g. calc.
w. b.s.

232

grh.
br. weath. weath. ch. b. q. s.

hill top, ^{white weath.} grey glassy slydite

150 yds

br. weath. q. h.

ch. q? s, much. ch.

somewhat slydite

- ~~a~~ q. a? b. calc. or. slydite

- b. & calc. shears, more
like a g. ph. weath. & ch.

shear

grh. amygdaloid calc.

glassy grh.

shear

g. ph.

g. ch. b. m. calc. shears

10 yds. grh., fine b, g, shear.

light br. ^{weath.} g. calc. or. ch. schist.

g. ch. ph. q. ^{calc?} shears &
fine d. g/k. ph.

gnh. - almost g. it
m. b. g. s.

top of hill
light. g. k. rh.

↓
arguay
in above
unaryog
hydrology

of fine brown weath.
d. k. schist. (basic)

more sheared. k. rh.
m, b. ch.

233

S30° to 310°

41 paces d. k. s. (basic)
br. weath.

br. weath. g. rh. b. platy aggr
g. sheared. also
fine m

light. k. rh (ch. b,
schistose, g sheared

brown weath g. rh. fine glassy
20 yds

20 yds behind hill k. rh.

gnh. pbs, glassy,
higher, calc omegadates
men glass

A. fine - white fbs,
sheets 3m, b & a

~~See~~
 a up to 5 mm occasional
 40 paces flies up to d. k. base.

{ 35 paces none schistors, black a 30%
needles 3mm, b.m., grey s.
 34 paces br. weath. q. calc? sheeted
 b.m.s., very q.

30 paces fine green GtA

50 paces fine grey wh. - b.m. }
 (brown weath) } Shua
 br. weath. w. q.s.
 g/w.rh.

Sheeted A, whiting upwards.
 61 paces a fine GtA.

for 48 paces

q banded bandweat
g.s.

light to rhylans.

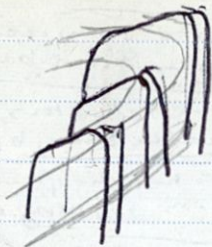
3 l. k.



gth

The gth and thin by
 a calc mch s., phyllitic
 GtA caps hills

235



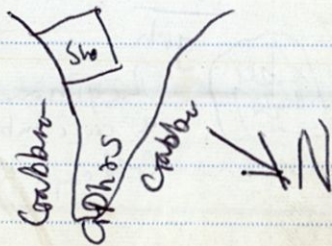
Structure
gph
faulted?

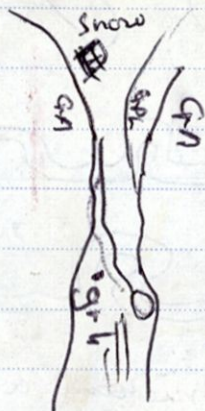
↓
\$ 200yds
2 higher
S38° to 318°

seems to be a gph / $\frac{kph}{\$}$ / gph
\$ series here. needs looking
at in more detail.
with phyllites / gs. higher
up.
gph

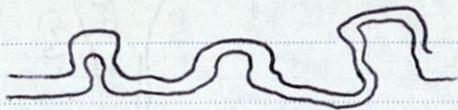
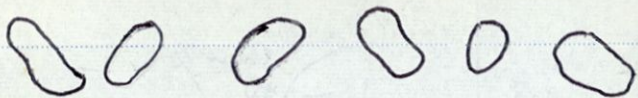
Strat =

| |
|-----------------|
| G.A. |
| gph |
| volcanics. hrg. |
| g.s, gph |
| etc |





The End
of
Volume I



Schist



Structures at 230

Plamparsen
white with
grey tan

pinkish

greenish

17 Feb
Carter + Jeff

(sub)

Fursske Marble.

Innammate

Fragmental

Euligeline Amph

One body - - - - -

Furmland

Sponsta

{ Psammids, coarse pellets
quartz. musc. phyll
muscle. phyll

Presth

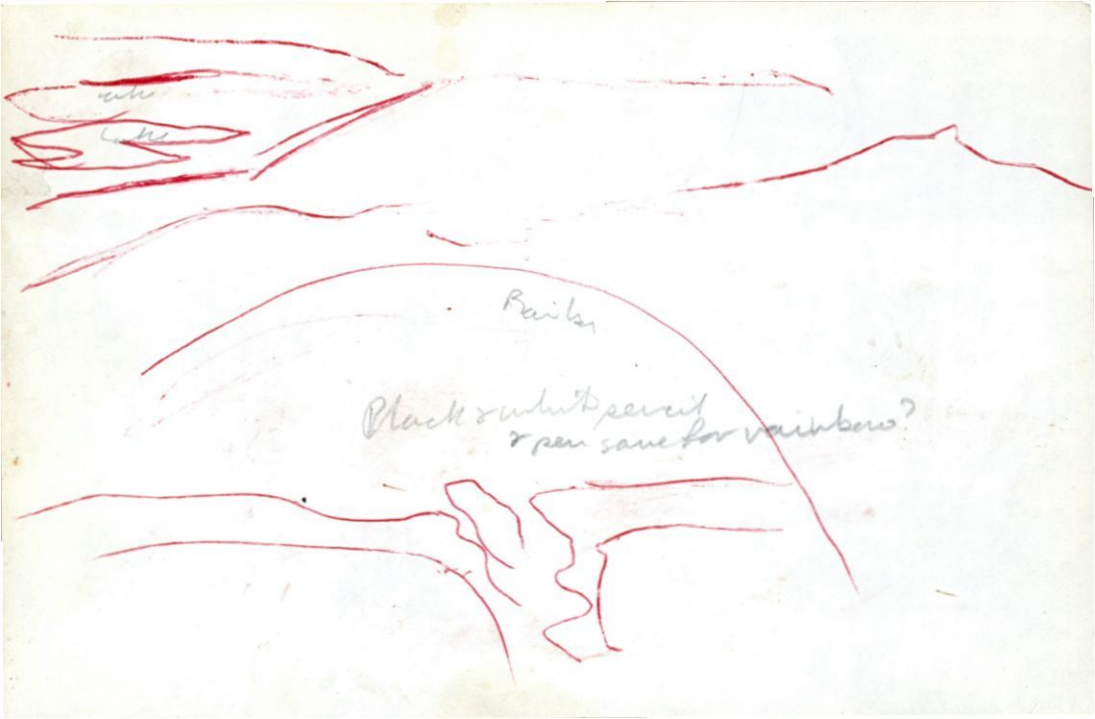
Sparagmite

Barenese or Greiss

Sample of pyrite - 127. -

also light muscovite South
Saldan beach.

- look along beach to this
grey? mine - sample.



with

to the

Railroad

Black & white pencil
& pen same for rainbows?

Schists

Calc or Noncalc

Weathering - Rusty or Grey

Marine or Fresh

Main Mica

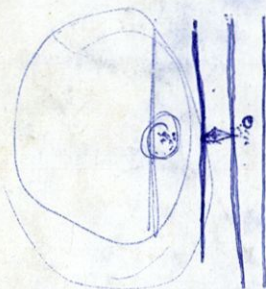
Grain size

Lamination

Porphyroblasts.

11 July 2nd

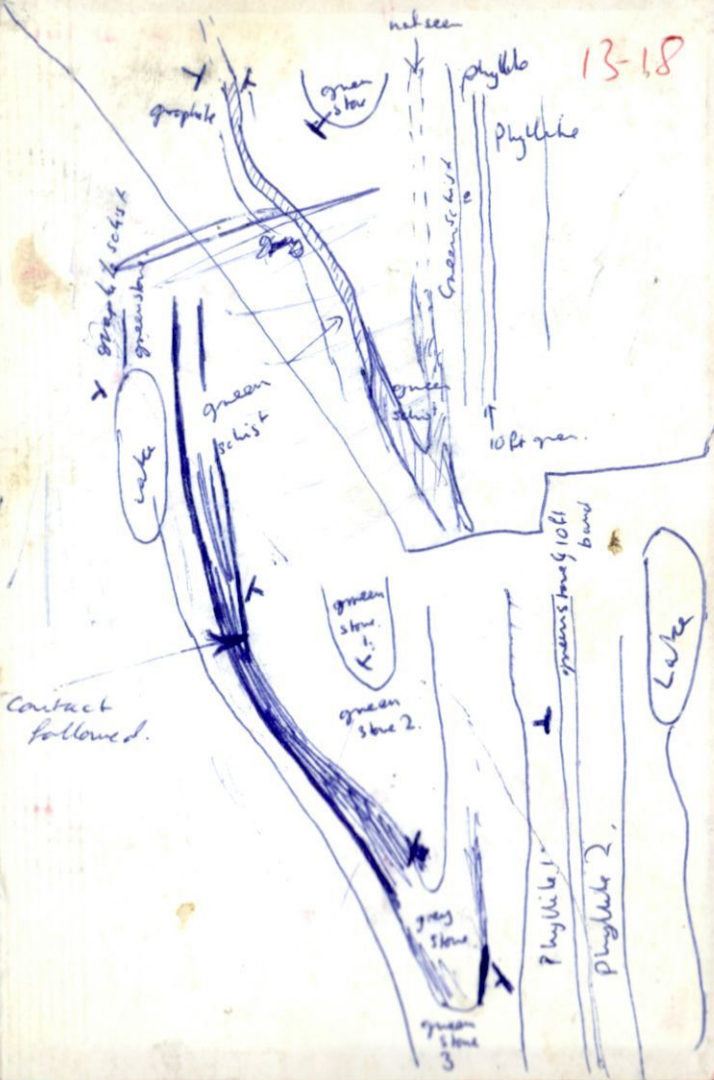
1111 11 July 9th.



long & sweeping



13-18



R.H. Findlay
Sulitjelma
1970.

Geology field notes.

Volume II

Mapping conventions.

$\frac{20}{\swarrow}$ - dip, short line, & number is direction of dip.

• 6 - station number - map

$\frac{6}{-}$ - notebook station reference
+ grid & dip (usually)

mb | mica schist.

bu - blue

h. - green

g. - grey

br. - brown

w. - white

bl. - black

b. - biotite

ch - chlorite

m. - muscovite

fu - fuchite

ga - garnet

a. - amphibole

q - quartz

py - pyrite

he - hematite

s. - schist

ph. - phyllite
Amphibole

GA - gabbro

gf. graphite schist

A - amphibolite

gf - graphite

B - Blueschist

G - Greenstone

lt - marble /
limestone

qz - quartzitic

fdsp - feldspar

ccp - chalcopyrite

ky - kyanite

d - dark

st - staurolite

h - hornblende

Each letter or letters
followed by full stop
to prevent confusion

H - hornfels

GA - Pyroxene gabbro

mt - magnetite

se - sericite

~~mb~~ mb - mica schist - general for
Junkerdal
area

→ A → monoclinal

di - diopside

Gr - Granite.

Tr. - Trondhjemite



} anticline

} cross folded plunging



} syncline

Gn - Gneiss

236

Faldas
15° 6' 22" 00

470 421

Aug 3rd.

brown weathering
g. m. b. streaked calc. s.

Strongly calc. Many small
folds.

Over next small hill,
GA, dropping into narrow, E side
gmb's/GA contact. 8ft given E/W
GA coarse & up to 3mm
dark k. to bl.

↓
70yds

across wash - fine 3mm a GA. 700.

↓
200yds

top of next hill, gmb's
going to A₂ 1mm, coarsening
upwards to hill top of 3-4
mm GA.

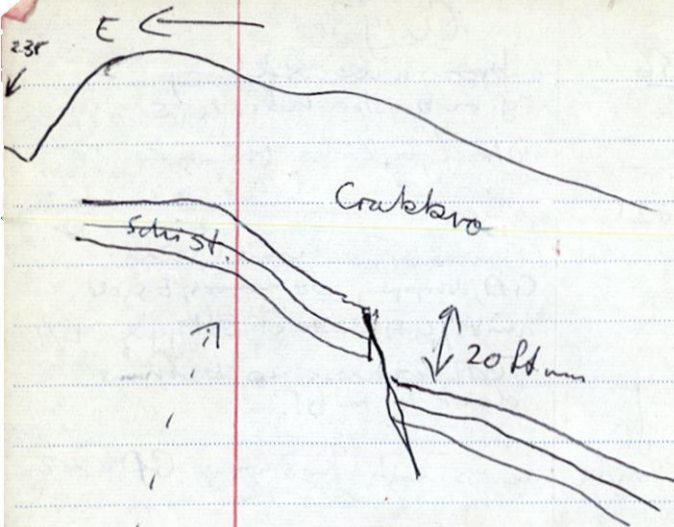
↓
200yds

small valley E, schist

237

475 419

Coarse GA on hill top after
gmb's in valley - reddish feldsp.
coming in in the greenish
(corundum) Just out
fine grey m. b. pelites, with
coarse bands.



very coarse grained - lead
structures

238

~~476~~ 418

481 417

80 yds



S. 10° 6090

After coarse g. g. mbs in cliff side, see opp. becomes greener to GtA contact, until fine GtA/coarse A, coarsening upward to coarse S. m. GtA at 238.

just over hill

cliff in g. g. calc. m.b.s. over N to north GtA, over schist as it appears.

239

~~484~~ 413

SPEC 33F

700 yds



near summit

240

S 45° 6295

487 412

In cliff

100 ft

GtA

~~thick pbi. q.~~
g. b. g. m. b. s.

or could the rock be altered g. m. b. s.?

or -
a light green pbi quartzite
pbi. 1mm, or g. 0.5 - 0.25 mm.
20%

Med grained GtA capping small
size - g. calc. m. b. s. below.

Look place 250 yards east by 2 lakes.

40 yds ↓

then

A west

100 yds east → g. rh. (white nearly)

80 - 100 yds light k. k. + p. typical.

20 yds d. k. a. basics.

100 yds m. b. ph. g. calc. s.
pb. feldsp.

80 - 100 yds br. weather green b. s.
- sheared k. k. ?? doubtful.

g. g. feldsp. m. b. s. - mic pelitic

local hill top in k. k. marked on photo.

g. pelitic s.

g. g. m. b. semi pelitic s

241

Returning West.

S30° to 310°

492 408

br. weather sheared k. k.
over a red to weather dark grey
pelitic fissiles.

dark green basic after 50,
(thin?) or is it just sheared
k. k.

↓
105 paces. brown weath.
mb. gnh. somewhat sheared, looks
fancy similar to
calc. s.

↓
over stream
80 yds white weath g. rh. - none
rhyolitic

↓
25 paces dark k. fine A.
v. weath
dark k. basics

↓
33 paces

↓
10 paces - none a' Bm, thin - earlier
by ~~ch. m. calc. s.~~ semi psammite
m. b. calc? quartz. s.

- 6 ft. between A & GA.

12 ft GA, dark k. basic -

uphill in calc. mbs.

for 50 yds - hill back.

GA, shranked gnh after 100 yds.

for 250 yds - then by pool

E bank g. calc mbs with
series of old bedding left
in places - across S. stream
by b & bards.

across Gabbro hills

GA:

7 pelitic $\updownarrow$ 80 yds.

krh.

$\updownarrow$ 43 paces.

Rie GA

Aug 4th

24 ~~2~~ 2

463 413

local S,

S55° to 164°

$\downarrow$

50 yds

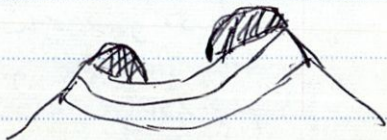
schist covered
by GA

S30° to 304°

GA topping hill above
mshydr weath. mb. pelitic;
heavily calc.

E $\leftarrow$

$\rightarrow$ W

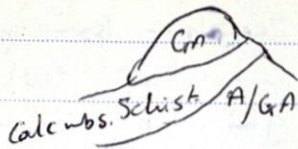


across valley, no exp,
then poor exp. of gabbro.

243

469 410

Note
K. polished surface



byss-el pad.

100 yds West, foot of cliff
- g.a. m.b.s - volc? Dirty volc
seen in cross joint across N 50 yds.

From here W 200 yds, GA
spring outcrop of ~~kh~~ k.pbi.g as
239

pbi - 0.5 mm. 20%

k.g. 0.5 mm 80%

also in present.

Bedding coarsest structure
dips opp. in cliff - show this
but at least overfolded.

above this 70 ft

(GA)

(kh)

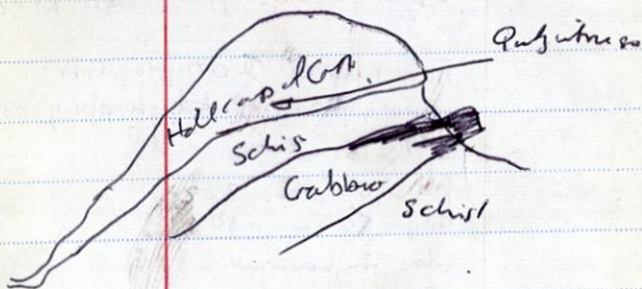
Fault?

Fault?

g.m.b.s.
a on schistness
calc also perhaps
bedding
structure.

GA can be seen
capping both mt
— uphill - GA, then
gamb in core of bed
on the other side - small.

By small look.



244

477 408

Across hill
and far away

241 kpb seems interdigitally
with gmb & calc. S. (Between
2 GAs)

245

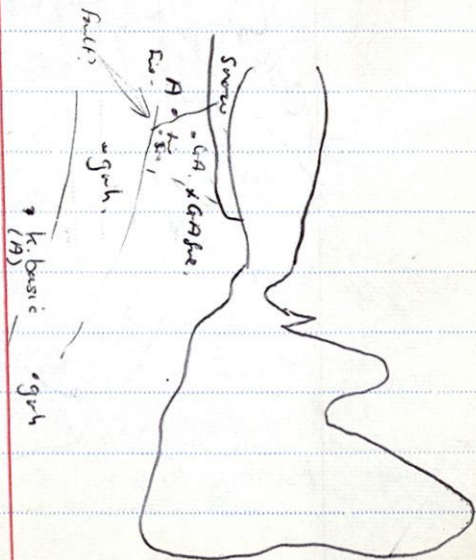
480 404

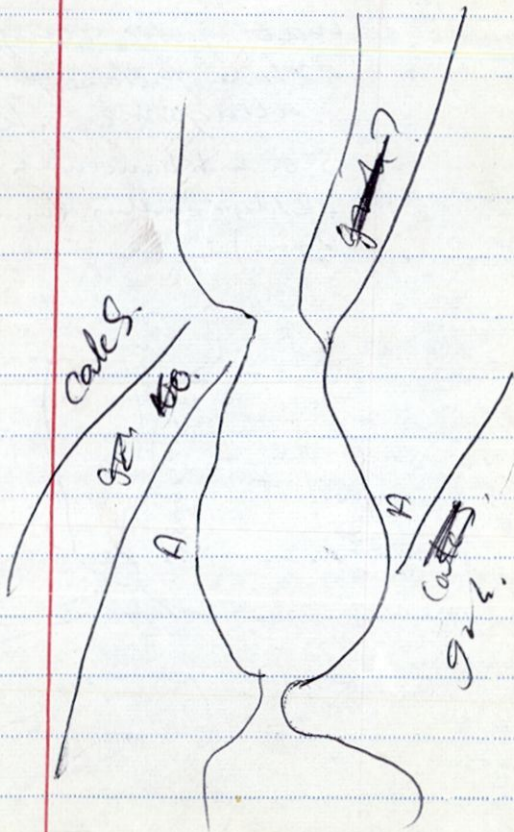
brownish gq. m.b. calc. S.
— nearly quartzite, light grey
quite fresh

Neot hill E capped
by (A) after no exp.

below is dark grey
matte quartz amygdaloid
grh. - followed
along strike or kit.

SW into K basic with 70% a,
+ feldspar lathes. (mass cgs
2mm.)





246

475 403.

Passing east from Lake,
across A, calc. s. ^{gph.} gpb. s. GA,
behind hill, gmb. s. (fine) after 60
semi-peli, p. b. int. S.

The across CrA, down
hill in hollow calc. g. mbs.
to top to CrA - homfels in between
40ft

2 gabbross

- 40ft?

- large long CrA. to schist
at 472 407.

Aug 5th.

247

549° to 280°

428342

g. ph. - small gabbro
intrusion - orientated A
also streaked with cl & b.
20 yards N of gph. - none
of an A than GA.

by the list of 2 lakes
g. ph. low. coarse streaking
A high ground.

g. calc. a (dark green)
10% limonite
in b sheets.
over west of 1st lake

becoming a little more ~~tan~~
pelitic a - w a.

avg/disp sheet in S.
regnetic

Into rising ground,
hills covered by amphibolite
rock. + py. small.
over g mbs calc.

248
By lake
520° to 283°

g. ^{calc} mbs + phyllitic
bands

on S side of small lake
lie toward basic intrusion
- mbs in between.
- east of lake. between
2 lakes - gabbro / mbs ph
contact.

249

250.

A coarse grained gabbro
textured rock with light
grey feldspars 50%
and a light

green minerals
epidote/chlorite? 40%

(replacing h
also some biotite 10%. More

Schistosity, shows a' below
ve. fine GA? - ~~can~~

across bog, gph all up
small stream to lake.

following cliff - in fine
fairly fissile k. ch. m. b. g. s

250

(k'), over gph.

251 overlooks lake in the ks.
over a cove? g-s

250 rock can be seen
striking across country. NS.
- below ks; g. pelitic m. s.

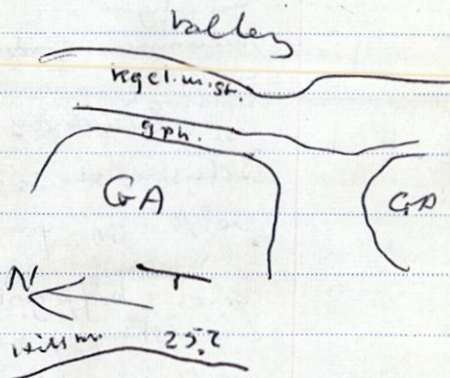
g. calc streaked s. more common?

GA by lake -
are gsp h or pelitic grey m. s.

254

443319

a massive k.g. ch. m.
stone below gph below
GA.



30 ft. ch. m. calc - schist.
semi psammite

br. weath. g. calc m. sheathed g.
g. ph. s. ek.

near top of next lull
calc sheathed g. ph.

— is this just top of 253
in stratum?

253

456308

~ right side of ghy,
about 200ft below
summit shing kph.

k.g.ch.s

rk.g.ch.ph.

grey seems to be nodulate

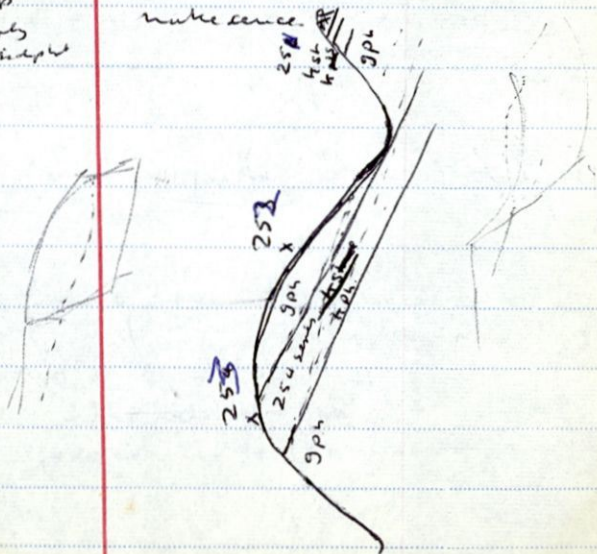
(i) & (ii) are they different - doubtful now.

253

459308

beds dip
less steeply
than with kph

Sometimes the structure doesn't
make sense.



fulbright stream in
a grey q. ch. m. b. s. / ph
series.

~~278~~

S20 to 278°

as above.

No exp. same!

br. m. s.

gray fissile mbs. Calc.

across to road, exposure
was too good in this

Sutcliffe
Map.

Aug 10.

Crabbie pers. & Fegentli
upper down - to hill top
(Sausserike CrA too)
to - ake hind hill top.

~~cate banded pbs.~~

non cate pbs. pel. s. banded - No.
coarse / fine

On uphill, none babbro,
drop into small drain, calc S.

To ft, calc gel banded
kely below across little
stream.

25A

483440

25G

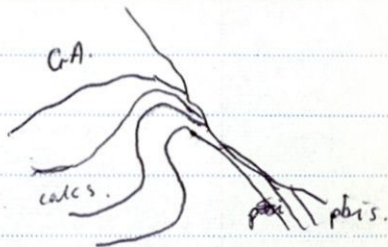
488438

CoA. - with thin pbi. lark.
between.

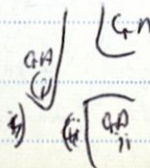
calc

banded pbi. s with
of $\frac{1}{2}$ " to 1". pbi. cut s.

canyon above 252



S. ~~side~~ side.



below CrA (i)

g. pbi. ~~+~~ glauy to qitic
rh.

pbi. 2mm 20%

below CrA (ii) narrow
g. calc. m.b. s. typic.

CrA ii

calc s. &
E. p. calc. base of ?
CrA i

g. pbi. rh

calcs above pbi's above
gent. metabasite

up stream g. pbi's

Crabbro (i)

g. pbi. rh 8-10 ft? e.

hairy calcs.

YES. m. ch. calc. breccia }
calc breccia }
s. ? }
Crabbro.

Upstream to marsh.

Gabbro, then gabbro kg.

anggdaloid sh.

then gabbro

- on N1 bank. bn.s.

on S bank much C.A.

^{near}
20ft C.A.

20ft. angg

50ft C.A.

20ft g. m. b. pet. s. faintly calc.

C.A.

top of marsh. calc. bn.s

on both sides. Thank God!

~~calc~~ - on up to top of
hill.

258

494434

Capped by calc.

across marsh - calc. s / calc.
bedded s. boundary -

or is hill topped by
just a thick calc band?

after this, none (G) with
dark. (k) g. rh.

^{brown water}
die d.g. marine & fish in

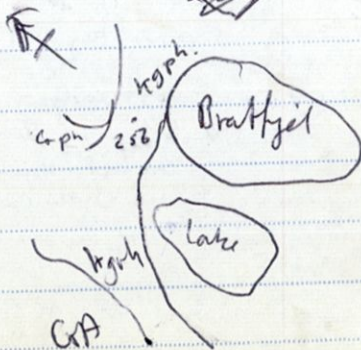
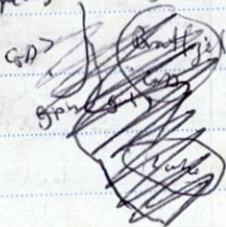
- lunch place

- across marsh,
gabbro, with

a br. sheen b. dr. rh.

- the rh seems to be seen
from lunch place
to low dark (k) g. rh.

appears to swing up to Brattjeil



252

300°
5670h 120°

490429.

The dk grh banded appear
to have g. semiglossy krh
as part of same facies -
in basis?
down a little toward 2nd
like br. weath. g. pel. s.

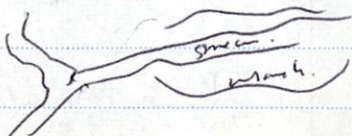
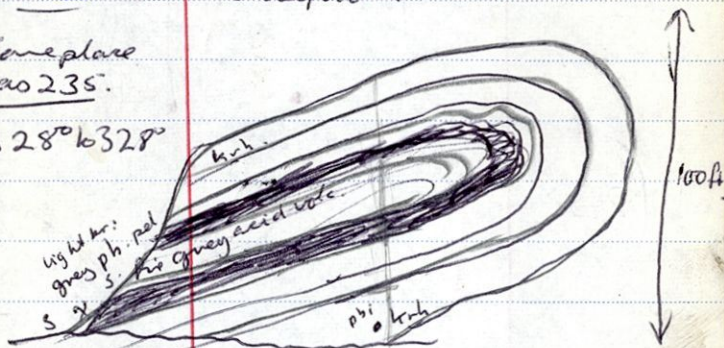
501429

258

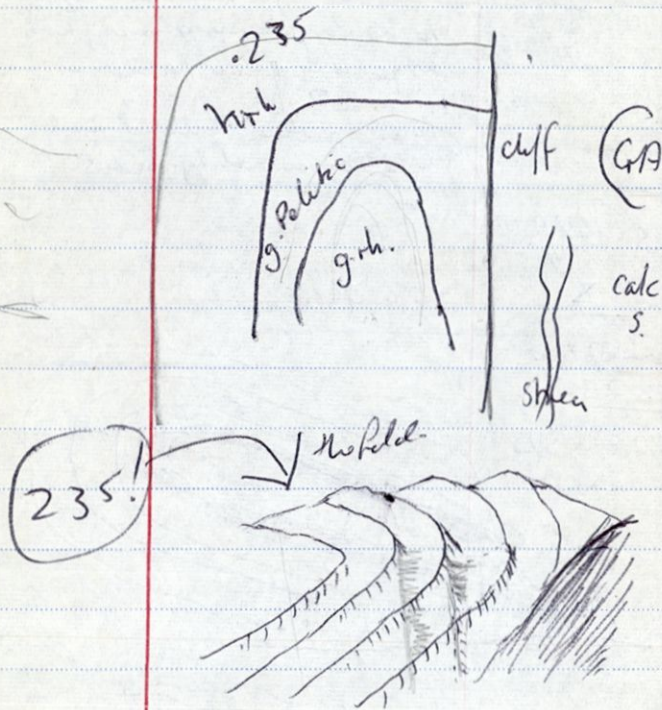
Overfold.

Same place
as 235.

S 28° to 32°



Is pel. shaved gah?



The bar round 235
has pelitic sub bands
in, but is predominantly
calc higher up

259
238

In stream in mist.

kph - no bi. - just glary.
too light for H.

12 p.

across stream. - bn. pels

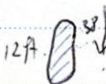
23 p

CrA.

33 p

bn pel s

105 p



calc bms
with net bands 6" each?
ps. white bands - no basal st
seen in stream in down.

166 p



gph
40 CrA

264

SPE34F

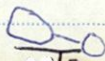
banded
high
arg pels

20 pels

80 CrA.

44 p 3 pels bms

66 CrA



bn - calc band

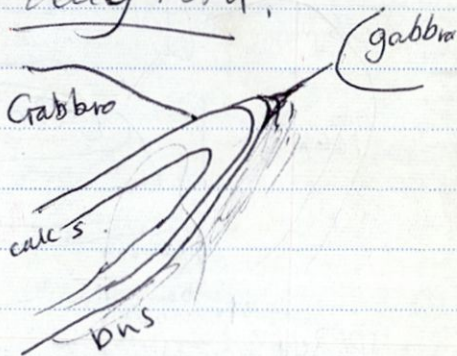
poi. banded s.
calc s.
calc pels
calc ph.p. banded s.

15. pet - calc bands.

99 pet. carbonate Sulic.

262

Aug 13th.

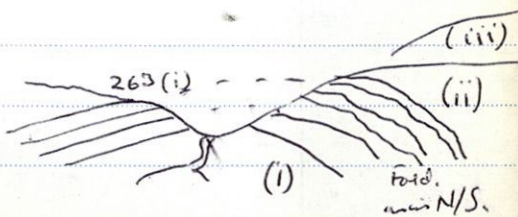


Overfold in calc s.
small grey m. calc bands below.
Unit (i)

263

Banded gph. to bichte
rich band top - fine up.
- naeschistose in places. - higher
unit by gpbkgrh.
unit(iii) hoh.

Between i) and (iii)
is a highly fissile
rock. "Hogney pelite" of 258
- shows a few small
met amygdaloid calc.
- another facies of gph. - pelitic
after all.
gph.



ii in more fissile lower
of i

S 35° 86°

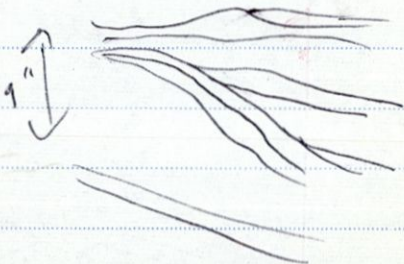
the

Quartz lenses have
in iii) by shear

4" x $\frac{1}{2}$ "

also isolated folds
in (ii) in main fold.

- bio. sheaths - old
bedding in iii

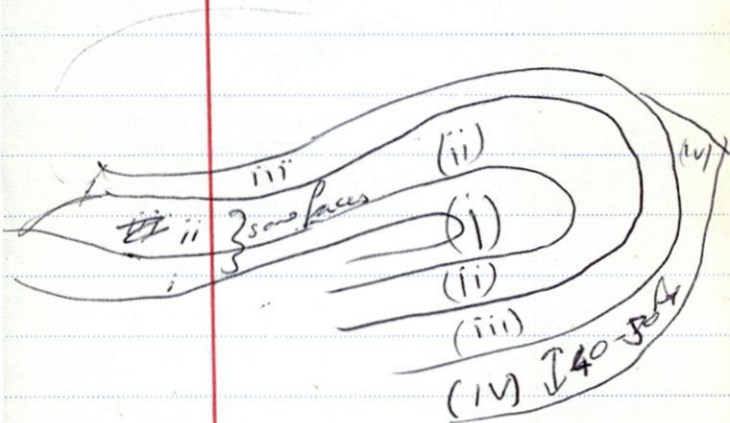


Banded pelite

↑ calc s.

iv
iii
i & ii

§ The pbl knt is on uneven calc
mantle by iv) a grey
brist non calc fissile &
fine grained schist
~~Protolith is calc s.~~



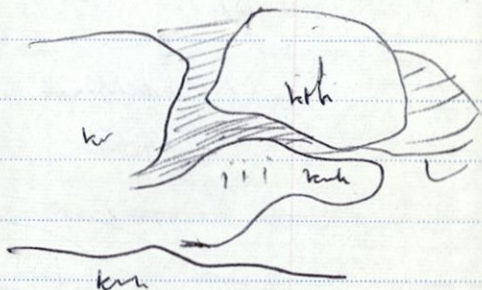
type band

calc s.



Calc s.
as at 257.

IV interbedded with
iii?



IV interbedded with iii

iii more massive
masses.

Units to ~~the~~ iii at
lower interbedded with
(V.)

at 257
S 55° to 300°

0 ft

ell

in bss.

above
fold

S 20° to 260° Waterfall ant

Junkerdal area. 16th

Aug 16th.

264

2922 78

+150 yds

(comp. at)

25° to 290°

white brown to fissile

yellow weath. g. b. m. s.

phyll beds, sheathed

bedded? in units of $\frac{1}{2}$ to 3"

small a rga of about 40-60%

by land

20° to 112°

inclination 5°

to 125°

white weath

a g. b. py phis fissile qtzic

sheathed - small m r b?

q. hie 70%

} 20° to 33°

200 yds
N.

Min. musc. - coarse grain
- up to 2 mm occasional
rounded? good quartzite

Abundant br. weath. grey
m. q. with b. s. fine q. sheath

fine q. 60, mica 40.
schistose.

- abundant quartzite as 264
with red ga 4 mm
100%

grades up into m. b. cl. ga
mica schist.

mass of weath. higher.

dr up to 20%

ga. 20% up to 4 mm.

m/b 40%

q. 20%

hill top b. q. like fine
sheath ga. br. weath.
Cheng Peng ga. abundance
in

h ~~30~~ 30 30 30 30 30
 m. ~~40 30 20~~ 30 10 30 20 30
 5224 130° 20 30 25 25
 10 20 15 15
 q ~~20 30~~ 25-30
 ga ~~10 20~~ 15

265
 522° 6 130°
~~298 286~~
 295 285

grey graphitic? bands dec + ga
 less biotite, more q, in
 graphitic stuff
 pbi, also some ch. coming in

garnet clinerals now to 25-30%
 more m, & also pbi.

q: 20%? and ch. 5-10% may
 be more.
 in variable.

more f a mica's

j. m. - 30 25
 b 30 35
 ch 40
 ga 20
 q. 6 8 10

515° 6 83

a cross snow! - ch. 30-40
 b 30-40
 q. total 20 30
 + g. x

Vertical foliation

Alban's new quarry

S24° to 120°
137°

quartz gneiss schist
- vertical folds

member

20° to 122°

over "Alban" - g. quartzite
quartzite

266

S28° to 85°

297289

Bachman gmb quartzite
sets ~~schist~~ schist

q. 50% - 70%

gmbgs / gmb quartzite

with
to north

267

299289
west of
301292

below is
gmb, now
filled with phyllite

a gmb quartzite
S - here are g. sheaths -
suggestive of pebbles?

- a metacong.
sheaths rounded up to
1 1/2" long axes at most



in cut
below to N

S25°6780

gamb. q.s.

cut - boundary with cl. ga. m. b. s.
grey, g. h. c, fairly coarse.

cl. not ~~the~~ small fold



lightens above, pbi. some
cuttings - much. m.

darkens upwards

then g. m. ga. m. b. ga.

with gf. bands, after

70 yards, more schistose
but still g. h. c.

268

S14 to 120°

g. b. m. s. - danks,
~~low~~ ga smaller

50 gds pbi white
m. ga. q. s

269

Thing of, certain by
a dark pbi q. s

S20 to 150° and overlying more coarse dark
ga. m. pbi. q. s

↓ 20 p (danks) g. pbi q. s

↓ gf

↓ 18 p danks g b q s semipel.

↓ 30 p gf

↓

133 p ga. m. pbi. s (Light)

S20° to 150°
2-3 mm

270

in pbs ques

to $\frac{1}{2}$ ff - ques

to dark g. gab s

across stream small

cliff schistose ga. m. b
quartz

S120° to 130°

50p ↓

Fold. m. g. b. s



highly highly

contorted g. streaked

coarse b. cl. rusty py s.

also rusty py s. to

pg.

in draw, overlying
contorted schist

" a ($2\frac{1}{2}'' \times \frac{1}{8}$) ga
m b s

271
S32°10'10''

g. weak
q. ga. m b s - some
of bands some almost
ph bands - note on
q.itic band radiating
a - $1\frac{1}{2}'' \times \frac{1}{8}$ black
some py not much.

leading
small

S30°6'20''

m (pink) s q b b
semi pelitic s

? →
mark?

Schistosity - almost
same as Spec 85 - no
ga or altho.

272



axis 30°

b 146°

across
draw

550° to 240°

~~My...~~
V. fine shales
Aphibolite very
fine - across draw,
small red gneiss

beyond lakes to W
g. g. b.s. semipelite.

over stream coarse

large dark a in

same but coarser.

over next stream at
base rock cl. b. g. s.

ve coarse, very,

S30° L248

273

SPEC35F

similar contorted
schist

a and epid also

present

coarser rapidly
upwards

ep 30%

a 30% 2mm

q 10

b 10%

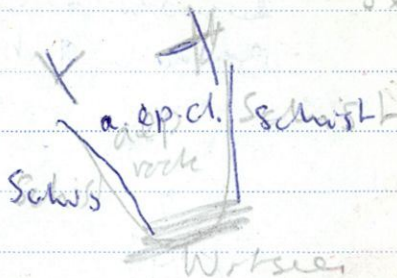
cl 20% decrease

into grass
growing in coarse.

g q a (huge) s

a syndium

S28° to 150°

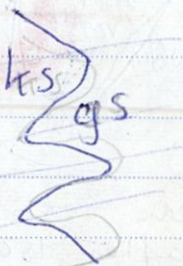


When 'contoured'
go after 150° to 200 yds.
200 yds with
source cl. mica
also ga

274 coarse k. cl. m. g. s + red ga.
S28° to 150° S. strike same to similar
to G. phyllite
m. 250°

to stream with
g b g s - fairly
fine

560° 6200° k.d.q. redgman, s
beyond grassed
area in g. b. ga. q. s



275 k d q ga s
past 275, ga, 500
— 3" lost in size
1" ga "ong"

§25° 6120° gs in stream
of on other side
gpb q s after 75p
white tenty begin

to
white mg pbis

(L for light)

mb

~~Aug 17th~~

Aug 17th

276

"Dante" schist.
ga. ~~schist~~ b.s. shows of folds
small folds and bands.

10° to 120°



250 yds

58° to 178°

cross valley (halfway) part
S lake - ~~2~~ schist. g
bichite.

52° to 013°

well beyond 2 lake
thin gf.
- gully small holes large

277

what appears to be a gf
~~mb. g. series~~ mb.s series

Paving north from W

S15° to 106°
(278)

-gf with ga. mb.

S2 to 197°
down crack
100 yds.

West again in a gully
g. mb.

S14° to 115° i) S of stream

S8° to 100° i) N of stream



S bank
200 yds W

S20 to 85° i) S. !

S13° to 105° N

• 70 yds

S15° to 146° S

unch.

~~200 yds~~

S27° to 060°

Imm calc grain Lt
bedded, q. bedded 4" to
6" also a little fine

W

Walking W, through
mb. s. sch. foliated
ve coarse mgy.
thin pure band
fine granitic (banded)
crosses coarse mbs.



Right way up?

over granite gneiss
foliated b. coarse 25% - up to 2 or 3 m
folds visible } 15 ft.
q. size

~~279~~ 279
~~279~~ 259281

S 2° to 145°
↓
yard W

S 25° to 145°

mb. mky. coarse q. sheets
r. microfossils

upstream -
thin q. white. 2 ft.

mb. 40 ft
lt. coarse
q. present also b. 1

↓ 30 ft

g. mb. - interbedded?

↓ 10 ft.

in Lt 1

rusty quartz.

↓ 4 ft

Lt 2. granular much
more pure, banded.

light
dark ↑ 2"

40 ft - large red ga? 2"
to 1/2" very

520° to 103°

60 ft.

↓

become quartz and less pure
higher up.

120-50 ft.

Re the b. gneiss above mb. (a) mb 20
gn 1 - g. b. 30.
50-60.

↓ 20 ft.

Lt 3 - same as Lt 2, but
blue grey, coarse?

↓ 100 ft

Lt3 ↓
200ft

q1 ↓
Lt4 10ft.

↓
6ft

30ft ↓

↓

100ft ↓

↓
70ft

20ft

SB

250

278

name brown b. m streaked
q. white. q 1

Lt. blue coarse.

~~the~~ q. lt. grey like back Lt4

W blue coarse

~~q. b. lt.~~ q. b. & lt mb

becomes pure calc higher
up - after 20 ft.

then q. being small blor
+ structure

micaceous to 200

harder

in beds with mb

msky mb - quartz shales, bands
coarse foliated schist
structures similar to Muir? - some
cl perhaps.

over top, within mb.
a gf & small local anticline

200 yds E miss
with red g. & a

300 yds

S 8° to 147°

by lake.

mb
= gf

- 90° - small.


300 yds W lake.

small branching in g. - plunge
to ESE.

28° to 1

✓

S 14° to 170°

Junkental
Balvatunap

Aug 18th.

E
S 28° to 120°

S 28° to 120°

yellow
- mica schists, overlain
by coarse fol. q. d. b. s.,
cf. Green Phyllite of Muaka etc.
gf.

282

S 20° to 138°

Granet

k. d. m. b. a.

cong" again

less ga. than before

coarse amphibol

just above, the light schist.

- uphill - grey q. b. s.
sheeted, medium grain.higher up, flaggy,
q. b. s., medium to fine,
then banded (1" units)
amphibolite for ~~20 to 30~~^{10 to 20 ft}
overlain ^{by} br. weath.by a
quartzite b. s.large q. banded calc. b.
q. s., partly weathering
with pitted surfaces,
shows microfolds &
mesofolds.Also, large coarse radiating
amphibolite. ~~as~~ Similar
to schist at 271. - the
succession there too
seems to have flaggy
schists lower down.further up hill massive
banded calc. b. schist.
fissile massive bands 3-4 inches
q. bands & boudins, fairly large

Humant?

S 18° to 168°

ii) 30° to 145°

through 200 ft of
shear breccias, in
a coarse orientated
amphibolite - dark green
a' 1 mm - 2 mm

a
Edsp $\frac{50}{150}$

- 30 ft thick

- calc. b. schist, becoming
non calc. higher up part
part - across hill in direction;
gf.

Fumilind
shrub
here.

- 50 yds over back, ~~the~~ the fiss
non calc. (b. b.) - across
streaming in 'gf'?

30 yds on, grey
microfolded fine grained ~~the~~ fissile
foliated schist

283

302272

100 yds
↓

Marble - granular, fairly
well packed, grains 2 mm,
bluish grey - about 7 feet wide
- lost down hill 20 yards

Another seen in front of
15 ft cliff about 70 yds - 100 yds
on

520° to 133°

Note ^{very} - purple-pink huge (thin)

This brown thin-fissile piece is fairly ideal at least - no garnet, but v. fine 'a' in schist.

The earlier schists before this lack "thin-fissility" and show more ~~complicated~~ folding. There is no more folding in this schist.

Lies! It does in a more massive series of otherwise similar rock - higher up - fissile - fine a, no gneiss, a shiny surface - more typical.

284

250 yds S

by large stream

- ga - black - 2 mm 10%.

in g. m. b. s., fine grain. typical Fennoscandia. Also fine dark small 'a', and also larger on surfaces - pelites.

- across stream to crest of msl, 17, + g. fine to medium, 60% a.

above a coarse pbc cutting s 'augen' schist, with many streaks and augen-like structures of g. partly incised

S35° to 133°

306 264

$\frac{1}{2}$ "

zeds
when

to a milky grey semi
retic almost flaggy
schist - similar in
appearance to flaggy s.
b. a. g. s. & fine in cutting s.

100 yds.

thin outcrop of highly fissile
sulphurous & rusty weathering
m. schist - above,
coarsely foliated garnet?
a schist - (cf SPEC 18F
Sulphidated schist)

~ $\frac{3}{4}$ q. ga. avals, long axis // to S
in fissile s. a few yards on.

muscovite/brown schist banded.
schist a. g. b. etc.

almost quartz in places
white quartz in small size,
gully in

285

520° to 203°

↓ 50 yds

537° to 172°

better surface

coarsely foliated ga?
m. schist. ^{above} ~~have~~ coarsely
q. calc - fine grained higher
up - some fine green
a in thin bands - diquartz??
yes - small specks - a
distinctive rock - banded and
streamed finely

some broad parts seem to
be recrystallizing in bands
as fine veins

— across shear over the
A with br. s —
chipside rich banded g.
in shear

286
S 30° to 130°
inclination
25° to 70°

307258

S 52° to 110°

interbanded
diapiric g rock ~~beds~~ with b.s.
& a.

calc b.s. fairly fine fissile
& gently folded a little
up hill WSW of 286 —

above a coarse b. sharked
v. w. g.

— No shealy Cr. intruded
400 yds WSW of 286

— di. — also interbedded in b.s.
v. closely associated to Pan
one unit.

Aug 1944

N 800 yds
Camp

S 170° to 185°

Fine brown q.ite, (m + b fine)
limestone 0° to 105°

70 yds limestone 50° to 135°

287.

S 10° to 117°

Brown q.ite, ga m. b. s. conchoidal
below.

70 yds

limestone
10° to 125°

thin q.ite (2"). mb below 117.
then cl. b. g. s. coarse fol. + red ga 3"
- less d. by a long way, u. c. m.
ends at drop

↓
700 yds

mb, ~~coarse fol.~~ m. b. q.ite,
highly micaceous - up to 50
408 mb. ~~fine~~ massive

S 15° to 112°

3 ft? over a coarse fol. m. b. g. s.
+ little m, t. s. a.

↓
300-400 yds

20 ft? mb m. b. q.ite - bedded
massive. Then m. b. g. s. &
lake

288

S 10° to 080°

gf?

mb. quite

gf

— followed a little
sings back. NE
towards end of lake
area

mb.s

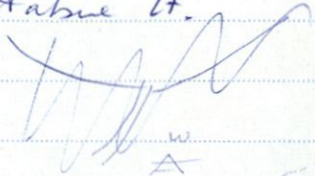
gf

515° to 75°

To cliff overlooking Pesto Marble,
in g. and mbs. and bsek.
mainly quartzites it seems

510° to 65°

a little west of 280
Tastabue lt.



280

mbq. narsio

512° to 82°

30 gals

by pool

58° to 90°

↓ 30 ft

S25° to 000°

↓ 100

S30° to 272°

thin lt, gl. in bgs

- local bed.

thin o

↓ across
draw 80 yds

S14° to 005°

↓

small local anticline, South limb

S12° to 075°

~ lt in next draw

S6° to 204°

↓ across
draw

S23° to 280°

- gfrubs.

weather.

S19° to 330°

Passing E

289.

Two nethe marine coarse foliated
mesotr micro fold m.b. q.s.

thick q. - within Peske Marble.

S5° to 090°

q. shears and beds

- 4 ft for 80 yds E, q. rich marine
m.b.s. 3 ft in lt

248301

5 Lunde.

S2

lt

q2

lt

S3

lt

mbgs

↓ up

3-11?

3 feet

S4° to 064°

thick
150 ft?

q. mbgs
unrec. base

S4

6 feet

↓ up. SS 6 ft.
Lt 2-3 ft.
SS gf. mbq. s.

Turning West again

SS
Lt low foot. 5?

SS on cliff - thin - over
Lt will in SS
into limestone
no exposure of
SS light.

Soft lake

S10° to S20°

290.

290. S2. - 6 ft. on thickens.
by crack
(pothole in stream)

S12° to 45°

249305

crossing S3, S4 to NE

291 263304

S15° to S20°

SS - scarp.

Passing N.

next scarp S6 - Lt between S5 & 6

292

local anticline between S6 scarp & here?
low dip, local thickness - 'orrible.

S12° to S40° Lt.

265305

293

← North



70 yds

lt always

S12° to 25°

30 yds

S21° to 38°

294

S26° to 24° qmbs over lt. & thin -
overlain by lt.

- in cliff face dk. A.
microfolds & nes.

axis dips
20° to 28°



A 4ft. highly sheared
mudquabs on top.

NE end of lake thin H/S sequence,
S20° to 77° then marine lt.

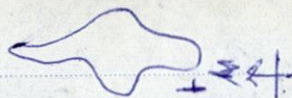
295 ^{subse} A in S/H series in diff
- interbanded.
S10° to 120°
268307 mostly coarse cln. g. s.
- overlain by coarse variety
sulphur coarse fol. of
- overlain by coarse fol. gam. cl.
fine a. g. s. v. coarse fol. coarse
g sheets bands banding etc
higher up more g. & b.

S20° to 30°

296
S16° to ~~60~~ 60° 60p. of thin ones in
ga incl. s
(10mm)

near NW
of large La

S20° to 76°



270 298

q. m. cl. b. s. - coarse, fol.
microlite, q. bands etc.
- much q. fine green a

297.

S20° to 50°

Two lenses? of gf. variety
- sulphurous weathering, with
a band of coarse pitted A
3 ft? in the chlorite mica
q. s.
- v. coarse ga & psi.

S ended
with

S12° to 88°

gravelled over above
A

S12° to 103°

S6° to 22°

Well known in W. side.

lineation
0° to 120°

boundary between fissile
br. q. & gab. hl q. s. coarse fol.
~~gravelled~~

800 yds
from camp
bearing
120° from
camp.

S 8° to 92°

8700
high of br. g.

Aug 20th.

g. cl. b. m. s.

g. of. m. b. s.

br. g. up ↓

298

In gully of arroyo of previous day.
g. cl. b. s. over lies lt + s.

Schist & lt series - Sp. schist
at top.

S 18° to 005° Below at foot of snow slope, the
dark green A. under a schist
mucky granitic patchily of. m. b. s.

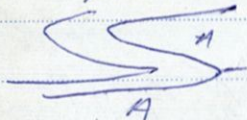
Small anticline axis dipping NE
(- perhaps 2 or 3°) within.

axis

10° to 140°

lenses of schist within

- an intrusive
vertical folds - gentle & open



12 ft

A

11 ft quartz
schist

11 ft

↑

2 ft mica

A

6 ft - 8 ft?

schist

occasional reverse fault occurs

$S 18^{\circ}$ to 44°

lineation

0° to 340°

A above, overlain by
fine fluc. of schists
S, fluc. of g. coarse fol.

- 20 ft, coarse A above.

A2: a' green 1 mm 60%

or fine

b fine 10%

g. felsp 30%

v. coarse fol. q. m.b. gf. s. gf 1-2 ins.

— A2

— Schist

A1 { lt A'
lt
Schist
A fine dark green,
so spec 294

Above A2, a good thickness
of schist, then to top of cliff
in a sulphurous rusty matrix,
coarse fol. gf.

Underlain by coarse fol. q. b. ga.
s.

Grt
Schist 30 ft

Quartz/s. base zone. q bands b.

21 ft main A band in band.
30-6 ft long show 2 folds
56-70 ft coarse fol. a. b. m. q. s. - black s

2ft
x
30ft
↑
↓
20ft

can
fol.

A burlin bed
fined.

b.g.s - none of lower
down

graphitic g.m.b.s. coarse.
+ lt. - first one maybe 10ft down.

from 1st lt.

100ft.

↓
AL

unbrd S

CIF

S'

2/S

A

S

A

S

S/L

AL

S

A

S

A

S

A

S

A

SS types

SS
series

SS types

thick

thick

518° to 30°

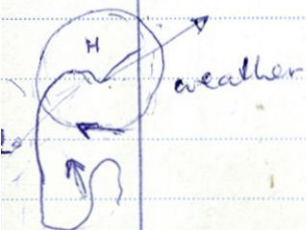
W. Run across ^{sh}S from 294

520° to 080°

6° to 110 - antedipis well

lin 110 to

548° to 26°



300

weather

120° to 92°

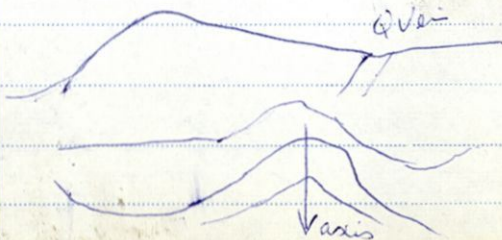
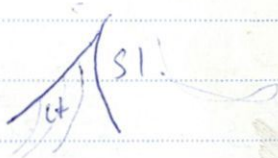
588° to 330°

old axis

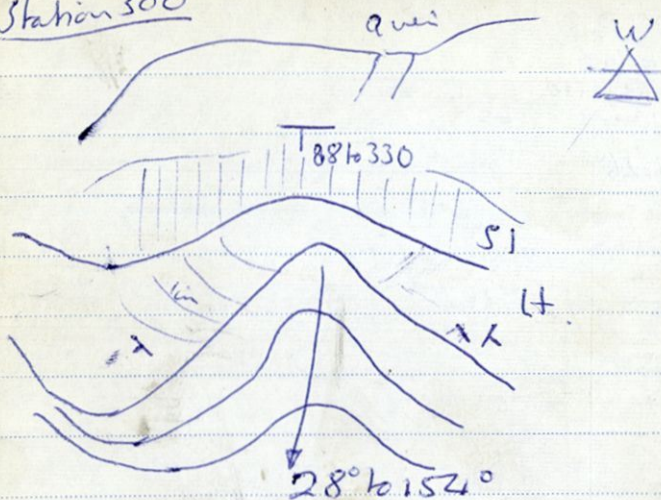
28° to 154

259 311

Lt, S.I. contact.
folded a little!



Station 300



contact appears horizontal
and coarse from distance

S1

lt.

Walking

~~SSE~~ SSE from 300.

S15° to 28° lt.

Note q. vein in S2? does
this follow with schist?

S10° to 60°

Poldaxis in schist L

16° to 67°

~~SS at 301.~~

301

SS

S12 to 158°

walking NE, just below 301
S - with g between L & S, a
series of thin 2 ft L
in S - an SS series.

banding L/SS, marks
L banding with a L/S
series of gf. in b.g. S coarse
fat. S1 - S13 are
white quartz

SS

thick L

302

gf, with fine dark A. 25 ft thick

S10° to 45°

270° 300°

303

coarse A with lenses? of gf
contact with coarse fat
gr of b.g. S. - in ss L?

36 F

zone of contact quite
nervy.

granular, A

304

S17° to 120°

SPEC 37F

Coarse A - long green
needles.

grassy - within light
schist - E side.

log

gf

a. ga. m. b. cl. g. s.

Impedant
Map.

Aug 21st

S22° to 090°

In gully below camp.
ga. fine a. m. b. g. s. (Light)

6" to 12" tension gashes

NE/SW - irregular bars

- 70 yds m. of cl. b. streaks
then over into m. ph. x s. g. s.

at lake

~~304~~

40° to 158°

30 yds

then very gf. - 30 - red ga.

Top of Muck, a true ga gunkie
b.s.

next
cut
fold down
14° to 226°
530° to 187°

gf. ~~gunkie~~
across^{ed} ga m. b. d. g. s

up hill to S.
br. weath.
calag. b. course s.



Thin white in b.m. g. calc. s.
a little cl. r. a?

80 yds
30° to 163°

v. s. thin fine dark green white
f. d. sp. A - 6 feet to 10 feet
calc s. again - g. streaky
& micro/micro pellets

coarse
a ga. a-m. cate
g. sheared unrefolded
band a little higher

thin fine fsc. 6A

20ft last light weathering
~~semiglossy~~ ^{coarse g.} b.s. coarse
fol.

50ft slightly cate unrefused
folded. coarse g. sheared
g. b.s. similar to one
below, but slightly
cate

8-10ft br. quartzite few b.s. fairly
fine, with similar
to above above

A, dark green coarse
stubby in 60% with
9/10d sp. vest-mentals

9 br 2 - Mic. s. - cat' becoming
v. coarse + coarse long a
loses in + cate higher

80 ft

br. sec

b + fine a
no
more m, less calc
b + a

cross mic stream

no m, calc

m? coarse mic calc

b + a s

no m. calc

v. fine a

no little

coarsely

bedding

fold.

few g

sheets,

micro/less
fold.

coarsen

on surface

br. m. s.

295265

Small part, top of T. perfoliat
coarse micine A, S/S
long dark green, white f. d. sp.
(aggregate) both fine and
coarse present - some crystals
up to 1" long - some calc
brackets things

coarse
fine

fold -
plus
mutual bedding

305

Port on top

S12° to 155°

296264

at top highly fold a-i-c
br. shows
cal. (cp). s. semi fissile
po

v. coarse A by last fold
carrying with

200 ↓ you

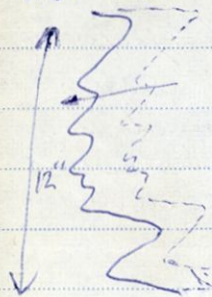
land?

200

bold axis

22° to 168°

S 300° to 157°



306

→ dark grey phix S f
long peninsula into
lake - thin band in the other
brown b.g. a (much fine to
course) uncalc. S.

S 206150
SPEC 36F

38F

with rusty weathering
band of dark grey pelitic phix semi
fiscle foliated S

forming ^{well} ridge behind
last of string of posts.

also some yellow

mineral stains

steep slope many mesotiles

- thin 1" calc bands.

- down to looking
uncalc (calc weather
at?) with a, - indicating
primary bedding?

western side of lake, mostly
dark grey with phix S - the
bed - much fine green in
these schists!

across thin rock face
S. side in br. g. m. only
fine a? b pelitic
- is very fine in these sections
low (brown).

Part last late unit, fossil
sand, meso nucle
feld slightly calc. coarse
b calc g? s - a little
m. (pelitic s) - then
heavy calc bands
could have changed in
places? quo. structure. up to
2 ft. - then into black
ga. grey s, fissile calc
banks.

100 yds
S 40° to 150°
thin
15° to 080°

Air cliff above, m. (argen)
S, higher? is this in 1st unit
above a Fossilad guess
unquestion

307
Blow cliff
29 & 254

Quartz streaked & small banded,
highly micaceous, more
grey when fresh

q. sheets small to 2 ft.
lenses 3 to 4 inches long axes
1/16 mica.

Small fine white fclsp, and
occasional dark a - 3 to 4

Q ¹⁵ ~~35~~ 40% } ^{tourmaline}
m ~~20~~ 20% } plates 2 - 4 mm
b ~~25~~ 20% }
a 1%
fclsp 20%
ga ~~10~~ 10 4 mm



| | |
|------------|-------|
| Q | 40 |
| m | 15 |
| b | 25 |
| tourmaline | 2 1/2 |
| fclsp | 15 |
| ga | 2 1/2 |

200 yds east
S46° to 148°

Mineral stained lightly
schistose with ~~some~~ b
schist + g? very fine
very dark.

Monocist.

✓

Bn. calc. pelitic below.

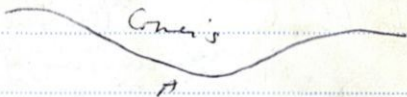
S28° to 122°

dirty gray fissile, pelitic s. below
faintly calc. - banded.
- typical funnelard.

✓
S28° to 144°

ditto

Incliff.



Bed in stream, before
junction of 3, non calc
dirty brown schist. - coarse
microfolds, a. less fissile

✓
S32° to 138°

In ~~open~~ brown a. b g? s

22° to 142°

- here pelitic, coarsening a little
uphill.

S26° to 150° ✓

nr. east top. ✓

S30° to 140°

100 yds.

S40 to 115°

ditto, coarser 'a' 1mm.

ditto + ga (black) coarse

ditto coarse

Just 20 yds north coarse A

- ditto schist.

gf towards top

- then A - fine, schistose

- no, highly 'a' schist

S16° to 166°

Just below the top v. much
marine unfolded in unfolded
non calc. a. schist + m. ob

A
S
gf

Just N of top

308

S 27° to 186°

~~Just N of top~~

S 40° to 180°

299 269

Assile going to north

Marsine

Non calc. a' schist and
thin pyritic - ve fine (gf?)

over calc. b. a? - s. coarse fol.
(to North). calc bands, micro/
micro folds in q.

↓ 15 yds.

amphibolite

↓ 50 yds

faintly calc. micro oriented folded
coarse fol. b. a. s.

↓ 50 yds

fine to medium A.

↓

30 yds

calc banded - bas - micro & microfolds
↓ 50 yds? down. in cave.
above even slope

S 30° to 112°

309

S 20° to 105°

297 269

More flaggy just below

A. below - very schistous.

micro micro folded calc & coarse
fol. s (etc)

Soil this
bloody
weather

DRIP NOTON
ME
BABE,
FORI
AMAHONEY
CHILE

schistose amphibolite.

↓ 20 ft down

stray calc s, coarse, mb, very
flaggy toward down.

S 15° to 146°

— bare of cliff

non calc q. b. m. s. - coarse fol

~~— of streaks, is planes~~

A rich - coarse A joint
below - with A up

to 10-20 mm x 5 mm

in fine white 60/40

A W.

+ red ga up to 3-5 mm

within k. cl. q. s. sgr.

+
joint part small pool.

m. b. a. t. g. s.

"Light" s?

none fissile, none a
to grains - A, q. s. 60%

Light S from rock.

311

S 30° to 284°

295273

S 25° to 176°

gf between lake.

(light?)

m.b. shabby & below

light schist only
folds h -

527° to 182°

Junkerdal
Map.

Aug 22nd.

SS
~~From~~ from 264, down
stream.

- 200 gds. 1) th Sheared m.b. gneiss } ^{Brown. quartz} interbanding
2) m.b. (pb) a.s. (Typical) } ^{Light}
30 gds. brown. s. graphitic incs? }
over 3) (fol) coarse q.b.s. (Dark.)
small cliff (Not fertile either!)

across ant.

$$\begin{array}{r} 27 \\ \underline{3} \end{array}$$

))) Folds.

is a fault in ant, (X) 2x3

brq. cf 1.

br.s. cf 2.

(3)

much ~~low~~ higher
than expected (50 ft)
than otherwise.

Str. 312 m (light pbl. s.)

520 to 147°

pbl. line on
surface

120 to 104°

east end
of pool

820° to 200

line

5°

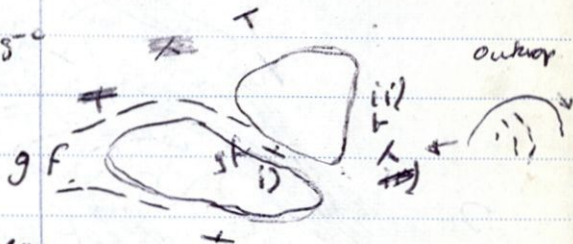
115°

313



i) $S 28^{\circ} \text{ to } 270^{\circ}$

lin
 $30^{\circ} \text{ to } 105^{\circ}$

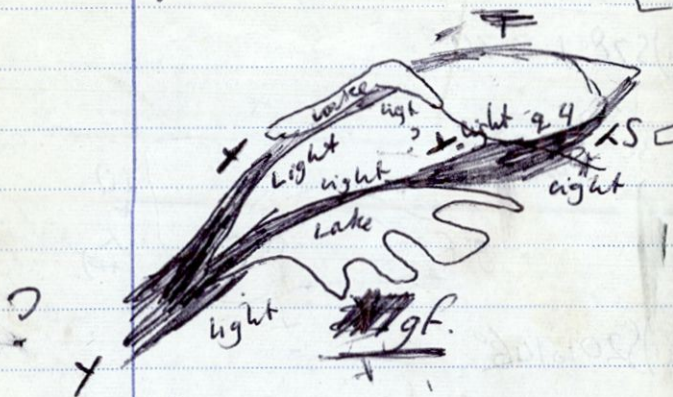


ii) $S 20^{\circ} \text{ to } 145^{\circ}$

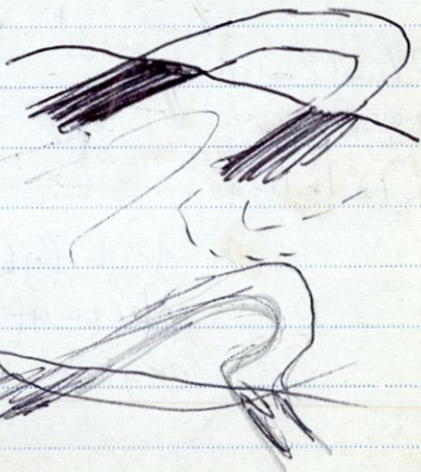
Behind 2nd g f
 $S 38^{\circ} \text{ to } 180^{\circ}$
lin^{phi} $12^{\circ} \text{ to } 108^{\circ}$

contact of g f & light.
phi in g f + q. !
or g f in light.

following gf.



3
S

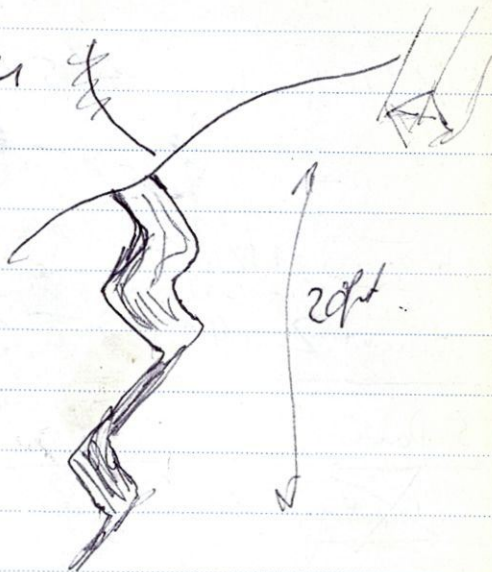


314

340° to 36°

100 yds south

820° to 170°



30° to 240° Light. W end of
lake by Ryd-

SPEC 37F galk 95. (5) B^c

~~(11)~~

green

ok.

br. g. 1

light 2 + 4 + gf

2 units
yellow &
green (?)
low down.

3 Dark

~~light 4 + gf. light~~

5 Green

8 Interadal Fls Aug 23rd.
map.

Evil
weather.

D
C
D
C
G.

316

folded fol
V. coarse m. b. s. in Ferru.
above ss pbi grey.

and the brown s.

shows blackga. or st.?

above y pbi,

" br. s. + a + vein

then more fissile, mky
coarser + at least typical
- little higher obj semi
pelitic fissile mky

s. mky interbedding

br./b. pbi together.

then bright g. cal. bn.
ga. mky shiny s.

317

S38 to 190°

up cliff. A, Finland
gneiss - in places with
a d. g. m. sulph
mky of botany pelitic s

in places Tondlheimite
in places gneiss,
@ T-ite bands -
4x12', bands
punched bands.

lin 18° to
103°

WNW of lake 1053

532° to 130° rusty spots in T-ite -
radio. holes?

- in schists, sulph. below
lunch place - with much
highly

Below W. Face

528° to 210°

lin
8 to 272°

under 200 yds. d. k. ^{red} going out
§38° to 210° clus b. grey

vertical folds
much b; & q shales

Thinners

as tubular in some fold.
becoming 'a' in further W

318

further
W on looks
evenly

§36° to 122°

lin

27° to 87°

dirty green
a? b.s

his
b close pack
to fissile

violet ga in non mol
incl. b s.

dirty - b rich
& m also

brown ~~2~~

loose pack,
fairly coarse
red in fol
red & q.

grey
non muddy, cl comes in

fine to med foliation

q. shales drag folds
etc. in both,

Schist

$\frac{1}{\text{mishy}}$ | un mish

$\frac{1}{\text{b.g}}$

fine
close

fine bed

no. fissility

st. sulphurets

$\frac{1}{\text{climb}}$
Vega

med bed

also
of neissess

$\frac{1}{\text{mb of}}$
looser
concrete

med bed

back towards lake 1053, and
a little ~~west~~ S.

S 32° to 148°

Amphibolite - dark green to red
lyst. 9 - as at before 318

319

Diope side rock
fairly coarse

SS46140

T bands v large
bx 15'

in g 1

320

~~846000~~

S4806002

gr
b. q. bands massive
non fissile

med. gr. banded
- various of sedimentary
structures (bedding)
many q. folds or waves
of - nearly gneiss

gal. cl. int. q. coarse mass

200 yds E

S1061340

S286
180

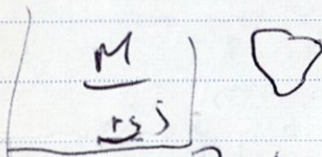
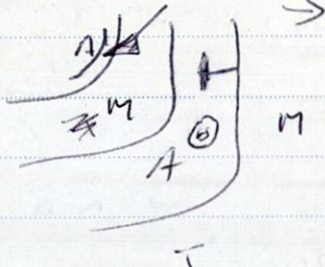
in mntg Schist Luther Nails

100 yds S28° to 180° in 70° to 102°

896140

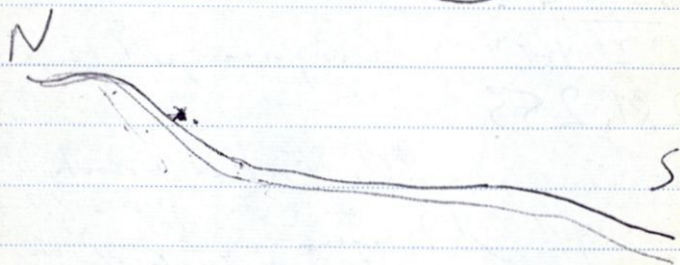
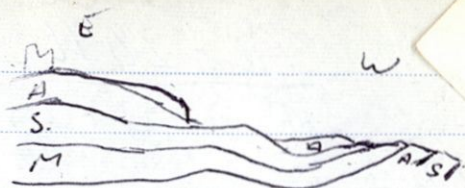
penalty below 300 yds
below Newes
about

anti drive



M Thick.
RS sheathed fine 30?
M
A
ms. S 6ft subpl. yellow green.

M
A
RS 7 coarser
M
RS



321
 $S 30^{\circ} 6' 158^{\circ}$
 $L 9^{\circ} 6' 72^{\circ}$



Aug 24th
Furberdal Map

322

522° to 160°

281 255

Grey br. pet. Fur

15 ft.

200 ft above country
g. g. rock + fine py 5%?
- below ^{in situ} A, fuchsite in.
Schist, unbed - coarse to
fine light to dark grey
streaked quartzite - red ga?

L 38° to 280°

20 ft.

Strong L on of banding in
fine dark. Hard A above
red ga with brown
intr. gneiss banding streaks

Gneiss - Furberdal above.

lunch place

Course to 1120

S36° to 096°

brs.
d.g. sulphur.
with the brs.

S25° to 138°

gs + ga, (brs,
non gusty
even)

S30° to 316°

323

top.

S822° to 138°

gs.

L11° to 82°

S36 to 156°

just below Tr at top

S22° to 126°

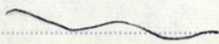
brs.



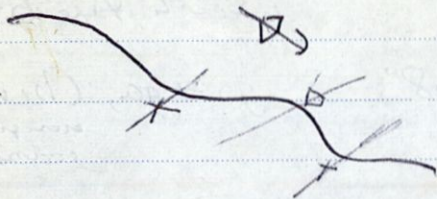
tree

~~all the~~ ~~gs~~

L to 078 - no clear plunge


crossed by all the ~~brs~~ at
90°

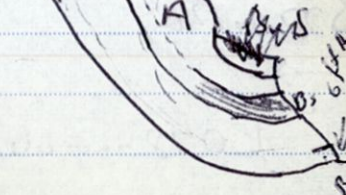
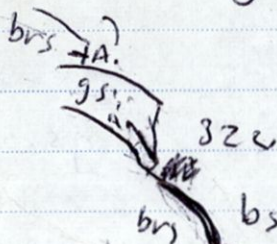
A

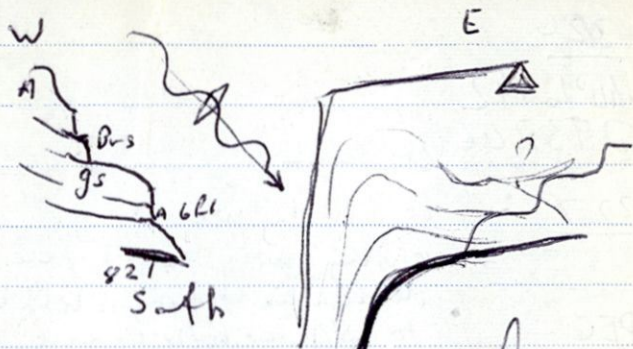


324

54.4°/60°

gs + g structures





325

582° to 186°

67° to 268°



528° to 182°



326

S44° to 142°

293246

327

a v. m. w. w. g.
s. of. s. + fine
derrived py, little
to 5% or rock (main
2 ft? underlain by

SPEC

37F ~~38F~~

S50° to 154°

q. diopside / bs rock. (large
nodules)

39F

higher 20 ft
w

W. nodules of q. in same rock,
but only a little. or then?

S58° to 160°

certain by g.s

S42° to 126°

328

S32° to 170°

end of line
Red

diopside rock
much thickness

S28° to 178°

SPEC

~~38F~~
~~40F~~

Module in one rock,
Tremble?

40F

329
S30° to 134 cal. bn. pet. s

Aug 25th
Junkerdaal Flap

330

↓ 100w

end of g. mod. q.
fdsp. Br. pbi mica s.
west.

↓ 200w

br. fdsp. q. + gf bands
- 100. gf

↓ 100w

dark.
ga. m. b. (cl.) q. s.
coarse fcl,

coarser s w, to granier
ground.

- m. cl. + occ. pbi

150 to 200 WNW

331 lunch.
S12° to 140°

thin coarse A + ep with
q folds + fdsp.

8 ft thick. dark grey associated

70 yds
↓
another coarse + fdp
phen.

SE - g. assoc. s.

- fine, granular?

- shear pbi sometimes

- oolitic by thin

v. coarse g. s. 20 mm
50%

- then fine

SE to lake. in ga. mica. s. - thin
amphibolite as veins
concordant with s.

332.

6" to 1'

↓ 100 N

S150 to 012°

- yellow m. pbi.

ga. cl. g. s. - m. pbi.

cl.

more

less cl. - more b, less m,

dark, no pbi

↓ N
70 yds

↓ 150 yds

NW

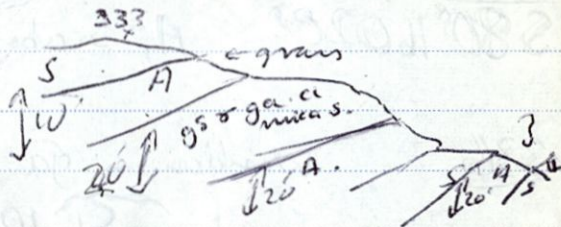
- then on into ga. cl. mica. s.

333

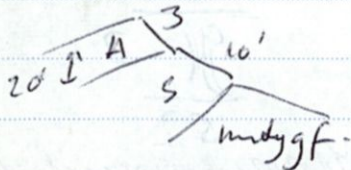
W

E

27°/20°



A ~~as~~ + gs; ar. or. Ga. d. mica
 S. + streaks of grey; dirty in
 places, becoming gs. of
331.



Back SSW

200 yds. small part gf

A small hand-drawn geological sketch showing a fault line labeled 'gf'. Above the fault, there is a layer labeled '3'. Below the fault, there is a layer labeled 'S'.

SELO A/S/gf/s/gf/A

335

S 80° 60 20°

A; S above.

336

Window in ga. cl. mear
shot.

S1 10ft

A1 20ft

S 16° 60 24°

gf 1 6ft

A 210ft

S 90° 02 20°

gf 2

S2

Mapping round to
lake.



Aug 26th

S28° to 134° g. br. cal. pel. s.
200 yds to S
Sander ↓
part Amph.

S50° to 110° fine gr. ss
m. sh. - pel. s.

S38° to 136° to massive g. s.
- diopside rock over wq.

337.

S42° to 140° br. s below Tr. intr.

S50° to 132°

50 yds S

S48° to 152°

Diopside rock

"One body" between g. nodules
them. nodules
rock.

kyanite in g. rubble behind
and to SW 70' yds

Point
328

No ore! ky rubble. SSE
200 yds uphill of small
lake - long blue blades in q.
(3 mm width).

"
200 yds east -
- above intrusion

338

Lake.

Much ky rubble in q.
blue blades as before.

Stop of mt

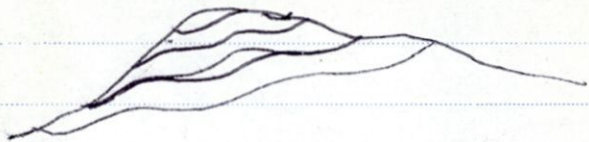
510° to 130°

on + dip in folds.

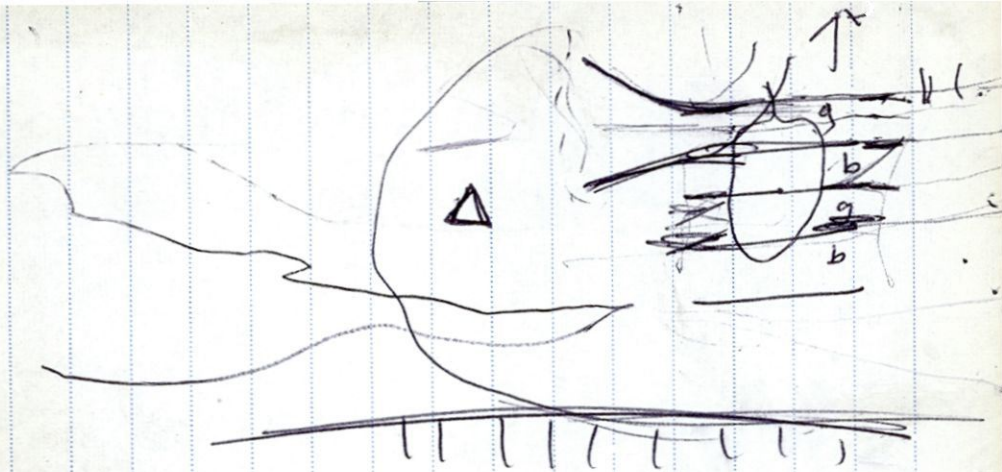
339

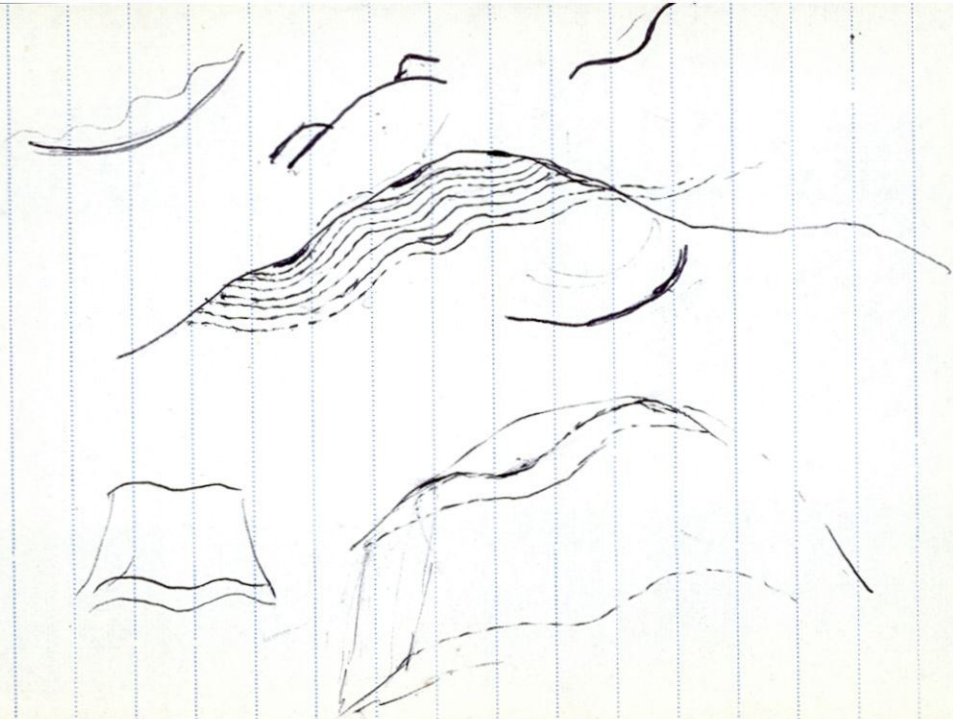
533° to 238°

v. occ. py in
rotted M.



The End of Vol 2.





4140F

Station 304 write.
Map of same
area.

No. & write
Specimens

4

4

4

4

4

4

2

4

4

4

4

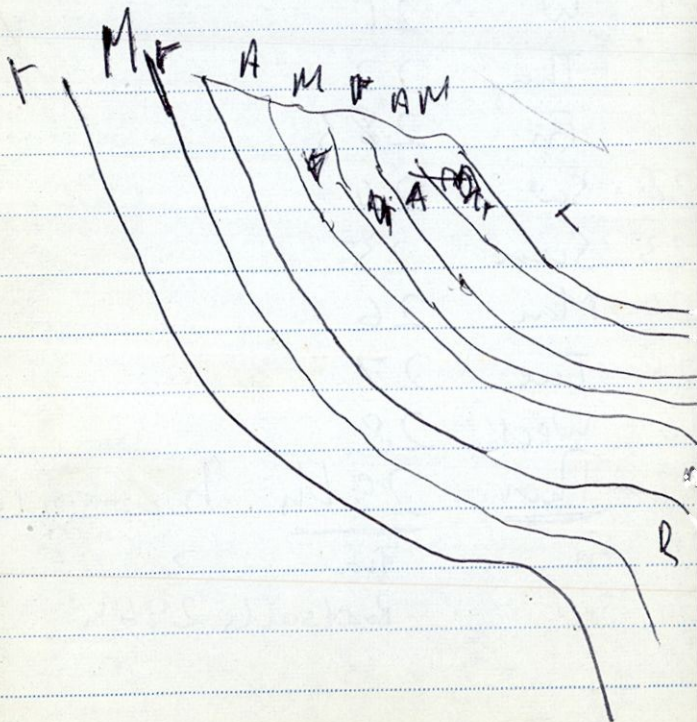
4

(40.)

4

| | | | |
|----|--------------|-----------------------------|------------|
| 15 | S. | 16 17 | |
| 16 | Su | 1 | 18 |
| 17 | M | | 19 |
| 18 | T | | 20 |
| 19 | W | | 21 |
| 20 | Thur | | 22 |
| 21 | Fri | | 23 |
| 22 | Sat | | 24 |
| 23 | Sun | | 25 |
| 24 | Mon | | 26 |
| 25 | Tue | | 27 |
| 26 | Wed | | 28 |
| 27 | <u>Thur.</u> | <u>29th.</u> | boat sails |
| 28 | Fri | Train | 28 |
| 29 | Sat | Boat sails | 29th |

W



$$\begin{array}{c} m \\ \hline a \\ \hline m \\ \hline a \\ \hline r \end{array} \quad \leftarrow$$

m

a

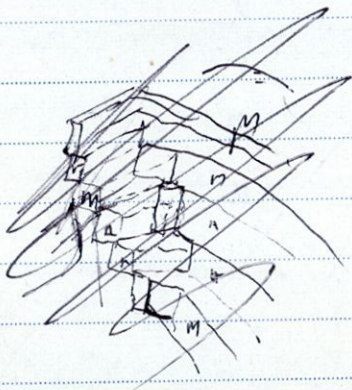
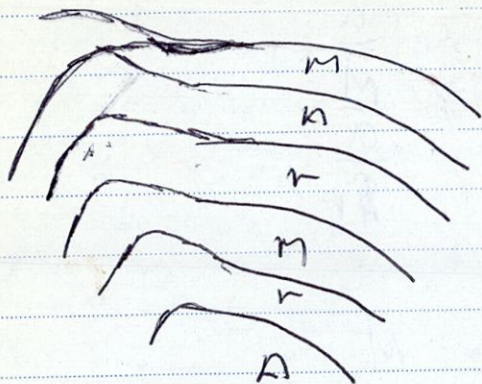
r

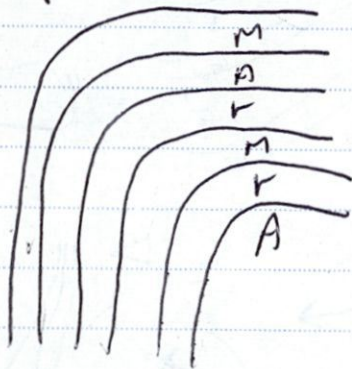
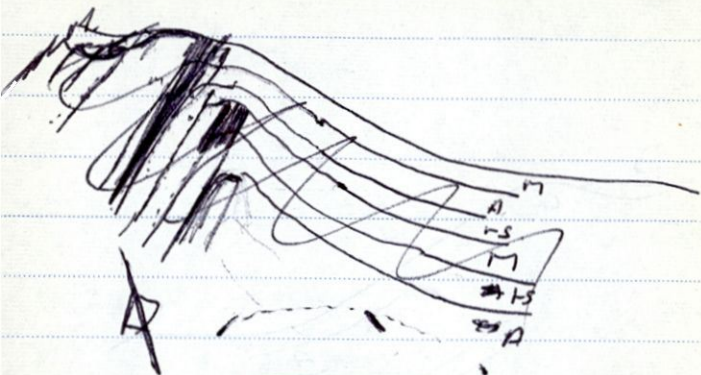
m

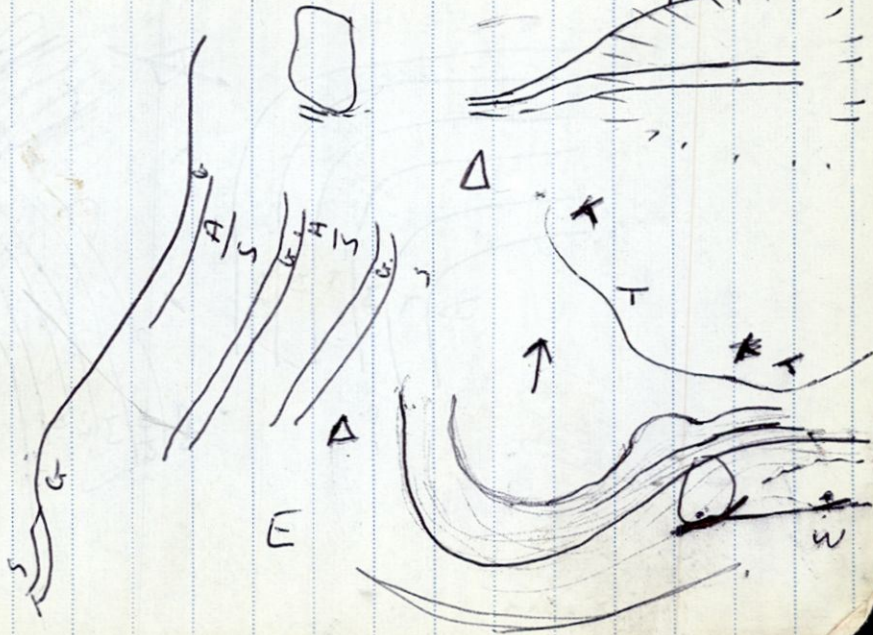
a

r

λ
 m
 a
 r







S. Kollung 1970

Supplement

Stappella V für Beltrami

Precegnuttskredsløp (under glimmerstrøper)

31. Glimmerarkose, V Langhammen.

Rik på småfider. Glimmerarkose drag
mellom kvarts/mikrokraklin i retstående mengdeforhold,
dels omtrent rene kvartsbæren og -laser. Kvarts og
feltspat er antakende. Max. lengde glimmer 2 mm, gj.snittlig
kornstørrelse $\leq 0,5$ mm.

Omtrent like mye mikrokraklin som kvarts
Reaktion sterkt undersøkt. Plagioktaser dels sercittiseret
n.v. $\perp$ n $\div 7^\circ$ > An 13.

25-30% glimmer, omtrent like mye biotitt
som maskeritt. Biotitt: mørkebrun i 2. Litt aktinitt,
dels som skiver i biotitt.

Aktinitterne: meget finkorrig spoket
Litt apatitt og zirkon - i biotitt.

Precegnuttskredsløp

32. Hver kvartitt, vestligst på n. Storfell

Glimmer parallellorientert. Juventering
med antakende kvarts og feltspat. Gj.snittlig kornstørrelse
ca. 0,2 mm.

Vel 50% kvarts, antakende.

Rik på plagioktaser, som er sterkt sercittiseret
kv $>$ n $\div 16^\circ$. På 4. med skarpe lameller. På et stikk n.v. 13° .
- Altitt.

15-20% glimmer, omtrent like mye biotitt
som maskeritt. Biotitten er sterkt rødbrun i 2. Biotitt

(2)

Klorall, delvis ut brøkk.

Akksessorier: finkornig opakt, forholdene ikke på gitter, ofte i brøkk. Spredte te av opakt

35. Trillinglimmerstøper, n. Storffjell vest.

Støperimaterialet slites utbredt kvart og feltspat. Kornstørrelse gjennomsnittlig $\approx 0,3$ mm. Max. lengde glimmer ≈ 1 mm.

Ca. 50% kvart, und. noe plagioklas (ca 10%) med myometaktilisk kvart $K > n > kb$. Tette skarpe lammeller. Pos - neg. Sammenhengende sur oligoklas.

Ca. 25% glimmer, med markant en brøkk, som er rødbrun i f. Vel 10% kalkspat, jevnt fordelt.

Akksessorier: ikke på opakt, konsentrert ved glimmer, overveiende utbredt.

Til te brunliggrønn lucerna

Pluektionsdelingen

34. Brun granatglimmerstøper, n. Storffjell (vestre)

Granatporfyrerblærer opp til 3 mm. Lengde av glimmer opp til 2 mm. Gjennomsnittlig $\approx 0,5$ mm.

Kvart moderat utbredt. Vel 10% plagioklas. $K > n \geq kb$ (Tette) lammeller. Sterke sericitiser.

Pos - neg. uv. 5-10°, mest ytterst (sørst).

Ca. 50% glimmer, enkelt eller i mye brøkk som markant. Densiteten er sterkt rødbrun og ikke på gitter med hale.

Litt kvart

Flere % granat, som porfyrerblærer. Til dels partikk-aktisk (kvart, opakt, plag etc). Ofte utbredt. Postlitteraturisk;

③

glimmer skjøer til dels her og der.

Rte på akkumulator: turnachin - Elägrann. Zirkon
ca. 1% opakt, finkornig. Apakt

De har Kalkspat og Kringsatt

1 Antikristallin, 5 n Storfelt

Finkornig - jernkornig. Gjennomsnittlig $\sim 0,2$ mm Granulært.

eller Kvarb som plagioklas, som har 17 ± 10 . Fe k.
med lameller. Ltt muskellin

15-20% glimmer, mer muskellin enn biokt, som er
skrevet rødbrun. Noe biokt, med eller utenfor biokt.

Ca 1% opakt. Fe k. zirkon

44 Antikristallin, V Langvann

Hvitt korneretelse. Max. 3 mm - lyse mineraler og
enkelte granatporfyrer. Gjenn. ca. $\frac{1}{2}$ mm. Granulært

Merk Kvarb, enkelte plagioklas: $11 \pm 13^\circ$, pos.

2 An ~ 5 . Skatte svartkorn.

Ca. 15% glimmer, blærmest ltt mye biokt og
muskellin. Biokt er rødbrun.

Ca. 1% granat, porfyrer (Kvarb, opakt). Substrat
- substrat. Trenger glimmer blide. Kvarbmestlunge er samme
type som utenfor.

biokt for en stor del ~~for~~ i biokt eller granat.

Ca 1% finkornig opakt

Ltt opakt og zirkon

(4)

43 Glimmerstuffer, 17. Storfjell.

Støtt småfoldet. Støtt utbredende kornstørrelse.

Max 2mm - brett og en enkelt granat. Muskvitt er for det meste finkornig. Gjennomsnitt $< 0,5$ mm.

Kvart i størst mengde, ca. 50%

Plagioklas ca. 10%. Ofte sonar, mest mest lavisk

Kjerner. Pos - neg. u.v. ca 3-10° An 12-18. Noe smertthet

Ca. 30% glimmer, mer brett enn muskvitt. Brettene er brungrønn. Litt brett

Epidot - flere %. Ofte cubedret. Til dels erhitt i kjerner.

Opakt et par % - finkornig.

Opakt Litt turnatin og zirkon

Granat En større porfyroblast.

11. Glimmerstuffer, 5. Storfjell

Støtt småkornet. Max. 2mm - glimmer.

Gjennomsnitt av kvart ca. 0,2 mm.

Ca. 50% kvart og 50% glimmer, omtrent like mye brett som muskvitt. Brettene er forholdsvis lyst brun.

Granat - flere %. Subhedral, tydelig porfyroblastisk. Mange porfyroblastiske innslutninger, mer kvart og opakt. Orienterte innslutninger parallelt strekningen. Glimmer strekningen.

Skisserer i opakt, mørkgrønn, meget finkornig turnatin, zirkon - i brett.

Fuortimutavdelingen16 Løkkglimmerstøber af Trerfjell

Brun, ujævn overflade - Støbet varierende Kornstørrelse
 Biotit opptil 3mm. Grynlig $\leq 0,5$ mm.

Kvart og plagioklas - rike på begge min. Det 50%
 hls. Plag. er per. ($An \leq 16$).

Biotit ca. 30%, forholdsvis lyst brun. Meget rike på
 innest. av klyngevisst og zirkon med boks. - Spredte K. av klonit.

Kalkspat ca. 10%, forholdsvis jævnt fordelt.

Klyngevisst et par % Zirkon - mange K. i biotit.

Opakt - finkornig, ca. 1% Trematit - spredte K.

4. utvirket finkornig glimmerstøber Trerfjell SK.

Tyrestøber, meget finkornig, gråsvart, mørk. Porphyroblastisk

Biotitporphyroblaster opptil 2mm, en del av dem orientert
 på tross av skifringstesen. utvirket rike på opakt, for skiv. et 1mm
 lange. Kornstørrelse ellers $\leq 0,1$ mm.

Omtrent like mye kvart som glimmer: med mye biotit
 enn muskovit. Biotit lysbrun, mørk fargeløs i X.

Opakt ~ 10%. Særlig av grafitt & Brun Firkant.

Zirkon mange lille små K. Spredte K. Klyngevisst og Trematit.

21 Brun glimmerstøber af Trerfjell

Meget finkornig, skikt planstøber med grønnstøber
 på skifringstesen.

Enkelte biotitporphyroblaster, delvis på tross av skifringstesen.
 Og granater - begge min. opptil 1mm. Mindre muskovit og
 klonit også for en skive del på tross. Grynlig Kornstørrelse $\leq 0,1$ mm.

②

Ca 50% Kvarts (Plag. ikke primær)

30-40% brødt Lysbrun. Mange innest. av Klinogorsitt og Zirkon med bakt. 10% muskvitt + noe kvart - meget lys

Fler% Klinogorsitt - mange i brødt.

Granat - få k. i slip. Porphyroblastiske kvartsmasselutninger. Flere k. har tungt omkringliggende mineral kande

Lk opakt, noe rød Feldspat Zirkon, tsurmalin

Kvartsdelingen

23 Glimmerik Øyegruis, N 5 Storfell

Gra, meget glimmerik. Fektpatogene mindre.

Øye: max. 6 mm. - av plagioklas. Andre øye er aggregerte av plag. og kvarts. Minste porphyroblastiske øye av muskvitt, opptil 3 mm. - Størst varierende k. størrelse, gjennomsnitt $< 0,5$ mm.

Ca 30% Kvarts Ca 15% plagioklas, som er soner. $\alpha \vee \max$ ca. 4° . Størst korn neg. Minste er pos. An ~ 20 .

Ca 50% glimmer, noe mer muskvitt enn brødt, som er lysbrun. Ca. 1% lys kvart, samlet få brødt.

Få k. granat og staurolitt; svært sjeldn, rett utskjenn, fulling, pleokroittisk, har int. farge.

Opakt rik på små k., fler%, for en stor del innest. kvart i brødt. Zirkon - innest. i brødt.

29 Kalksilikatglimmerstøper, S 4 Tverfell

Vektstende lysgrønne og brune bånd etter diopsid/brødtmineralitet. Diopsid forholdvis grovt, max $1\frac{1}{2}$ mm. 8/14s meget finstruktur, ca 0,1 mm. Omkret like mye lys som mørke mineraler.

(7)

Lys mineraler: Rik både på kvart, mikroklin og plagioklas

Plagioklas: u.v. $\perp a$ ca. 24° , γ An 45.

Mørke mineraler: Tilnærm. like mye diopsid og biotitt

Biotitt forholdvis lys. Børstet sortet grønn Ca. 5% hornblende:

grønn til brungrønn. Flere % Klinoklasitt

Akcesorier: Rik på kvarth, litt opakt og epokitt

47. Brun, rusten glimmerstøper, s. Storfjell.

Finkornig med gjennomsnittlig kornstørrelse $\sim 0,1$ mm

Muskovitt opptil 1 mm. Granatporfyrblastar opptil 2 mm

Ca 50% kvart 15-20% plagioklas, som er brune

u.v. max $\perp a$ ca. 27° , γ An 50.

Ca 30% glimmer, tilnærm. like mye biotitt og muskovitt

Biotitt forholdvis lys

Ca 1% Klinoklasitt Ca 1% granat m. porfyrblastar

Kvartsmuslinger.

Akcesorier: noe finkornig opakt + zirkon

50. Grå, ^{grau} glimmerstøper, s. Storfjell.

Forholdvis massiv. Max 3 mm muskovitt og 2 mm

granat. Gjennomsnittlig $\sim 0,5$ mm. Muskovitt også i finkornige aggregater

Ca 40% kvart - stort underskutt, også i grove stør.

Ca 10% plagioklas u.v. $\perp a$ $\div 7^\circ$, pos. γ An 15

Ca 40% glimmer, noe mer muskovitt enn biotitt,

som er forholdsvis lyst brun.

Flere % granat, som porfyrblastar.

Noe kvart, både ved biotitt (mest) og granat.

Akcesorier: opakt, finkornig og farne, brungrønn.

Zirkon og opakt

(8)

48. grå, rusten glimmerskifer, s. Stappell.

Grunnlig grov muskell, max ca 3 mm $\frac{2}{3}$ av
gjennett. $< 0,5$ mm.

Vel 50% kvart (Plag ikke påvist).

Ca 40% glimmer, mer muskell enn betitt, som
er forholdsvis lys. Finken som grovere k. er også muske-
rell i finkens aggregater sammen med opakt.

Staureritt Få korn

Aksessorier: finkens opakt, brungrønn turnation

et mikroskopisk undersøkelse av bergarter
fra Storpfella V for Botvaun.

Tillegg til rapport 1970.

S. Kollung

46 slip er stoffene bergarter er undersøkt.
De er fordelt på samtlige avdelinger over de basale
bergarter.

Kalkavdelingen

- 47 Brun, fintkornig rusten glimmerstøper, s. Storpfell
- 48 Grå rusten glimmerstøper, s. Storpfell
- 50 Grå grovgrimmerstøper, s. Storpfell
- 29 Kalksilikatglimmerstøper, s. Storpfell
- 23 Glimmerrik dygne, s. Storpfell

Furukundavdelingen

- 21 Gule støper: Fin kornig, brun glimmerstøper, s. Storpfell
- 41 Midtre støper: Fintkornig, mørk porfyroblastisk
glimmerstøper, Storpfell
- 16 Undre støper: Kalkglimmerstøper, s. Storpfell

et kvartitavdelingen

- 11 Gule støper: Lys granatglimmerstøper, s. Storpfell
- 43 — " — : Glimmerstøper, s. Storpfell
- 44 Grønt arkosestøper, ~~Storpfell~~ V Langvaun
- 1 Fintkornig arkosestøper, s. Storpfell
- 34 Undre støper: Brun granatglimmerstøper, s. Storpfell

Prestavdelingen

- 35 Kalkglimmerstøper, s. Storpfell
- 32 Uten kvartitt, s. Storpfell

Sparagmitavdelingen

- 31 Glimmerarkose, V Langhammen

Spargmittårdelingen tilsvare "under glimmerstøfer" eller er disse forandringen gjort i endelingen:

Turundårdelingen. Den melleme Kalkglimmerstøfene går inn her, som en underdel det stødningen blir da 3-delt som i feltet øst for Batnåalen. Som mellom Låmivann og Batnåen er det porfyroblaststøfer i en smøte del.

Kvartårdelingen. Etter undersøkelsen i 1971 syd for Batnåen tilhører dygnissen (Turundgneis) denne avdeling. Bergarten har nærmest glimmerstøfer sammensetning, med mye mer glimmer enn feltspat.

^{Mt} Arkoser, Kvartitt

Bergarten i Spargmittårdelingen (31), som mikro-
skopisk ser ut som en glimmerstøfe, virke seg i slup
å ha et meget høyt feltspatinnhold. Mer er det av
mikroektin, som fins i omtrent like store mengder som
Kvart; dessuten er det noe plagioklas, som er en
sær oligoklas. Bergarten er en glimmeraktigose.

Kvartitten (32) i Piertårdelingen er meget urolig.
Den er rik både på glimmerminerale og plagioklas,
som er allike med få % An. Kvart utgjør vel halvparten
av bergarten.

Arkoserstøfene i Muortårdelingen (1 og 44) har
begrenset sammensetning. 7 pr. 1 er det foruten allike
også litt mikroektin. 44 har jevnt porfyroblaster.

Glimmerstøfe, gneis.

Kvartårdelingens ^{grå} glimmerstøfer og dygniss har noe
mer markant enn biokt. Kalkglimmerstøfene 16, Kalk-
silikatstøfer 29 og en Turundstøfe ²¹ har like eller ikke
markant. De øvrige har kjennet like mye, eller noe
mer biokt enn markant.

Prøvene 11, 41, 21 og 48 fører ikke plagioklas
De øvrige er rike på plagioklas (10-20%). 7 støfene

i de enkelte andelinger er det ikke en skarp limester, og mineraler er derfor ikke blevet bestemt nøjagtigt eller sammenlignet i det ene eller andet. I Thach-andelingen begynder der at være mindre plagioklas: An 15 i gneis-glimmerstøper 50 og An ca 20 i dygnis 23. To prøver har imidlertid bare plagioklas: An 45 i kalkalkaliskstøper 29 og An 50 i falkerning støper 47.

Kalkalkaliskstøperen er ikke på mikroskopet. Den har nok forbindelse med siden af dioprid.

Kalkglimmerstøperen har ca 10% kalkpat, jemt fordelt i begynder.

Granat findes i prøverne fra de 3 øverste andelinger. (7 felt er også glimmerstøperen delvis inde på granat). Den er porfyroblastisk, og størrelsen af delene varierer over glimmer. Til dels har den et meget omkringliggende mineraliseret område.

Thach-andelingens dygnis 23 såvel som støper 48 har små mængder staurolit.

Epidot findes i mængde af støperne, op til flere %. Andre akcesorier er opakt, sammensynlig er mest sovetkis, hornblende, zirkon og apatit. Den meste ~~støper~~ støper 41 har store mængder opakt + sovetkis + grafit?

Det er ingen væsentlig forskel i mineral-sammensætning mellem støperne i de øverste andelinger. Den Thach-andelingen stiller sig et ved sin høje metamorfe mineraler: bare plagioklas, dioprid, staurolit (og opakt).

GEOLOGISKE UNDERSØKELSER

Storfjella V for Balvann

15. - 27. august 1970

Sigbjørn Kollung

Robert Findlay, assistant

I n n h o l d

| | Side |
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| Arbeidet | 1 |
| Stratigrafi - petrografi | |
| Oversikt | 1 |
| Basale bergarter | 2 |
| Undre glimmerskifer | 2 |
| Pieskiavdelingen | 2 |
| Muorkiavdelingen | 2 - 3 |
| Kalkglimmerskifer | 3 - 4 |
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| Skaitiavdelingen | 5 - 6 |
| Tektonikk | 6 |
| Mineralisering | 6 - 7 |
| Sammenligning med østlig felt | 7 |

ARBEIDET

Kartlegging av Storfjellsområdet vest for Balvann, tidligere lite kjent geologisk, har knyttet sammen områder i vest med basale bergarter, med områder i øst med høytliggende bergarter (Furulundskifrene i NØ, henholdsvis Skaitiskifrene i SØ).

En på tidligere geologisk kart avmerket "malmsone" ved S-enden av vann 1053, mellom s. Storfjell og Salefjell ble fulgt opp.

Feltarbeidet ble utført i tiden 15. - 27. august 1970, fra teltleir i dalen mellom n. Storfjell og Tverrfjell, med den engelske geologistudent Robert Findlay som assistent.

STRATIGRAFI PETROGRAFI

Oversikt

Feltet er stratigrafisk delt opp i 7 avdelinger, fra de aller laveste til de høyestliggende bergarter i Sulitjelmafeltet.

En basal avdeling består av granitt og gneis. En avdeling - Pieskiavdelingen - har marmor som hovedbergart. De øvrige har glimmerskifer av sterkt varierende karakter som hovedbergarter. Samtlige glimmerskifer fører både biotitt og muskovitt. I om-
talen av dem vil "brun glimmerskifer" - si biotittrike skifer, "grå glimmerskifer" muskovittrik skifer.

De 7 avdelinger er fra øverst til nederst:

- | | | |
|---------------------|---|--|
| Skaitiavdelingen | : | Vekslede finkornig, brun skifer og grovere, grå skifer. Nederst med kvartsitter. |
| Furulundavdelingen | : | Glimmerrik gneis.
Amfibolitt. |
| Øvre skifer | : | Brun, finkornig skifer. |
| Undre skifer | : | Mørkegrå til brune finkornige, ofte porfyroblastiske skifer - med grovere brun skifer. |
| Kalkglimmerskifer | : | Varierende brune skifer, som oftest kalkrike. Delvis med hornblende. |
| Muorkiavdelingen | : | |
| Øvre skifer | : | Grå granatglimmerskifer, delvis klorittrik.
Feltspatrik kvartsskifer. |
| Undre skifer | : | Øverst delvis grå, ellers brune granatglimmerskifer. |
| Pieskiavdelingen | : | Kalkglimmerskifer øverst.
Marmor, glimmerkvartsitt. |
| Undre glimmerskifer | : | Brun glimmerskifer.
Tynn kvartsitt nederst. |
| Basale bergarter | : | Granitt, finkornig gneis. |

1. Basale bergarter

De basale bergarter opptrer i vinduer vestligst i feltet, øverst i Krågdalen og nordfor.

Det største er i Krågdalen og består av en lys rødlig middelskornig granitt. Den er for det meste helt massiv, men til dels, særlig ved kontakten til overliggende bergarter, noe foliert.

Et par mindre vinduer V Langhammeren består av finkornig, grå gneis for det meste forholdsvis massiv, en mindre del noe sterkere skifrig.

2. Undre glimmerskifer

Ved eller meget nær basis av avdelingen er det en tynn, lys, finkornig kvartsitt med glimmerrike striper. Mektigheten er for det meste omkring en meter eller under, maksimalt 2 - 3 m. Juronkvartsitt?

Ellers er det brun, delvis granatrik glimmerskifer, ofte meget rik på kvartsårer, av lignende karakter som undre Muorkiskifer.

3. Pieskiavdelingen

Fra en smal sone på S-siden av basalgranitten svulmer avdelingen sterkt opp nordover, som følge av større mektigheter i kombinasjon med foldninger.

Hovedbergarten er marmor. Den er lys grå, middelkornig, noe skifrig, temmelig uren med rikelig av glimmer.

Særlig i undre deler veksler marmoren sterkt med kvartsrike bergarter. Kvartsitt med tallrike glimmerrike striper og bredere bånd (glimmerskifer).

I den sydlige del er det dessuten enkelte bånd av finkornig mørk biotittgneis.

Øverst i avdelingen er det nord for Langhammeren en forholdsvis lys kalkglimmerskifer, med tynnere amfibolitter og marmor.

4. Muorkiavdelingen (Sjenstå)

Som Pieskiavdelingen er også Muorkiavdelingen mye mektigere i NØ enn i SV. Den bygger opp størstedelen av n. Storfjell, hvor dens mest utbredte bergarter, ulike glimmerskifer med kvartsskifer, gir en meget karrig vegetasjon.

Glimmerskifrene er over storparten av området delt opp i en undre og øvre skifer, med en mektig kvartsskifer i mellom. Sydvestligst, der kvartsskiferen ikke opptrer, er ikke den øvre skifer utviklet.

Undre glimmerskifer. Overveiende brune glimmerskifer med mer biotitt enn muskovitt. Særlig i øverste deler av den er der båndvis lysere muskovitt + klorittrikeskifer av samme type som ligger over kvartsskiferen. Den overveiende del av glimmerskiferene er meget rik på granat, noen steder med korn opptil cm-størrelse.

Kvartsskifer. Lyst brunlige, noe ufriske feltspat- og glimmerrike kvartsskifer, for det meste finkornige, delvis noe grovere. Ofte granatrike. Fører mer eller mindre av glimmerskiferbånd, helt sydligst er disse av brun skifer, lenger nord overveiende av grå muskovittrik skifer. Helt nordøstligst er der over store mektigheter en stadig veksling av kvartsskifer og grå glimmerskifer. Bergarten antas å være dannet av sparagmittisk materiale.

Øvre glimmerskifer. I likhet med undre glimmerskifer meget granatrik. Den kan deles i 2 hovedtyper: a) Meget muskovittrik, lys grå til mørkegrå skifer med mer eller mindre av biotittporfyroblaster. b) Klorittrike skifer med tilnærmet like mye biotitt og muskovitt. Type b, sterkt småkruset og meget rik på kvartsårer, ligner, bortsett fra sitt høye granat- og biotittinnhold, meget på Muorkiskiferen øst for Balmidalen.

De øvrige bergarter i Muorkiavdelingen er grafittskifer og amfibolitter. Særlig amfibolittene gir en frodig gressvegetasjon, i sterk kontrast til omgivende glimmerskifer. Grafittskifer opptrer til dels i ganske store mektigheter, både i undre og øvre del av avdelingen. Amfibolittene, hvorav de største ligger i undre del, har ofte større hornblendekorn og er for en større del meget kalkrike.

Ved foten av s. Storfjell er der i brun glimmerskifer enkelte smale bånd av finkornig planskifrig gneis.

En tynn marmor finnes nær toppen av n. Storfjell.

5. Kalkglimmerskifer

I syd danner brune, for størstedelen mer eller mindre kalkrike glimmerskifer en distinkt og mektig sone mellom Muorki- og Furulundavdeling, og det er derfor naturlig å skille de ut som en egen avdeling - Mot N smalner sonen sterkt av.

Kalkglimmerskiferne, som har skarp vegetasjonsgrense mot underliggende Muorkiskifer, er varierende utviklet.

En mindre del av forholdsvis finkornige og planskifrige, av lignende karakter som kalkrike skifer i Furulundavdelingen øst for Balmidalen. Størsteparten er grovere, med ujevn ofte sterkt hullt overflate. De er delvis rike på større hornblendekorn, noen steder er de granatførende.

I undre del av kalkglimmerskiferen er det enkelte tynne, finkornige lyst brunlige glimmerrike og sannsynligvis feltspatførende kvartsskifre lignende Muorkiavdelingens kvartsskifre.

Det opptrer en del amfibolitter, til dels meget utholdende, noen av dem forholdsvis mektige. Amfibolittene har sterkt vekslende struktur. Tynne amfibolitter nederst i avdelingen er finkornige og tynnskifrige. Høyere oppe er amfibolittene overveiende mer massive. På Tverrfjellet og videre vestover har amfibolittene bare svakere utviklet foliasjon og er størstedelen forholdsvis grove. I alle fall en større del av amfibolittene synes således å være intrusiver.

En tynn grafittskifer finnes i østlige del av Tverrfjellet.

6. Furulundavdelingen

Furulundavdelingens glimmerskifre skiller seg fra lavere skifre ved å være utpreget finkornige og tynnskifrige. Det opptrer imidlertid også i denne avdeling grovere glimmerskifre. I likhet med Muorkiavdelingen er den delt opp i en undre og øvre underavdeling.

Undre glimmerskifer. Gråsvart til brun, for en større del rik på biotittporfyroblaster. I de finkornige skifre er der flere bånd med grovere, muskovittrik og til dels granatførende glimmerskifer. De mektigste av disse er skilt ut på kartet.

I Ø-kanten av Tverrfjell ble to tynne, lite utholdende marmor sett.

Øvre glimmerskifer. Mer homogent utviklet enn undre skifer. Mørkebrun farge, ofte med kalkrike striper. Delvis med granat, som danner små knuter på skifrihetsplan. Noen steder med langprismatiske hornblendekorn i litt grovere skifer.

Amfibolitt. Over glimmerskifrene er der en forholdsvis tynn, men meget utholdende amfibolitt, tilsvarende forholdene lenger nord i Sulitjelmafeltet. For størstedelen er amfibolitten finkornig og sterkere skifrig østligst - hvor den er mektigst - noe grovere og mer massiv.

Gneis. Øverst i Furulundavdelingen er der en gneisbergart som er forholdsvis massiv, men har et meget høyt glimmerinnhold, omtrent som i skifer. Av glimmer er den rik både på muskovitt og biotitt; muskovitten er for en større del orientert på tvers av skifriheten. Den er delvis granatførende og har noen steder turmalin. Ofte er den rik på linser av kvarts og feltspat. Gneisen har sterk rustfarge på overflaten. Noen steder har den små trondhjemmittiske ganger.

Bergarten ligger i Furulundgranittens nivå og er meget sannsynlig en sterkt omvandlet varietet av denne.

Furulundavdelingen ved feltets Ø-grense. Syd for Åsfjell er den undre Furulundskifer utviklet, men lite mektig. Den er her grønlige, med biotittporfyrroblaster. Lenger nord ligger brun skifer som den øvre skifer i den sydlige del av feltet direkte på kalkglimmerskifer. Ennå lenger nord - henimot Båsjaurre - er der mektige amfibolitter over kalkglimmerskiferen.

7. Skaitiavdelingen

De mest utbredte skifre er rustne, ufriske bergarter med båndet struktur. Andre skifre er i kontrast meget friske. Grensen mellom dem sees på lang avstand.

Rusten båndet skifer. Består av to komponenter: I størst mengde en mørkebrun utpreget tynnskifrig og finkornig skifer, av lignende karakter som Furulundskifrene.

Over Evenesdal er der flere steder en tynn, blågrå kvartsskifer, som glimmerskiferen utpreget tynnskifrig.

Den andre komponenten er forholdsvis lys grå, grovere, muskovittrik. Enkelte steder, syd for vann 1053 er der grov cyanitt på kvarts.

Grå glimmerskifer (gneis). Denne friske skifer ligner den grå komponent i den rustne skifer: Muskovittrik, forholdsvis grov og massiv med overgang til gneisstruktur. Delvis er den rik på granat.

Diopsid(?)glimmerskifer. En tredje type glimmerskifer er en båndet brun/lysegrønn skifer. De brune bånd er biotittrike, sterkt skifrige, de lysegrønne er ganske massive. Mengdeforholdet mellom brune og grønne bånd veksel sterkt. Ved lite av brune bånd blir det en temmelig massiv bergart.

Foruten i enkelte smalere bånd finnes bergarten i ganske store maktigheter ved NV-foten av Salefjell, i utkanten av feltet.

Det grønne mineral antas å være diopsid.^{x)} I tilfelle har bergartene en påfallende høy metamorfose. Riktignok er der en del sure trondhjemsittiske intrusiver i området, men de er av meget små dimensjoner, slik at en høy metamorfose ikke kan forklares ved kontaktvirkning fra disse.

Kvartsitt. I nedre del av avdelingen er der i Ø i assosiasjon med diopsid(?) glimmerskifer, en lys grå kvartsitt med en stripevis veksel av finkornig og grovere materiale. Den grovere kvarts må antas å være dannet ved rekrySTALLISERING. Kvartsitten har mange bånd av lys, grov muskovittrik glimmerskifer.

Amfibolitt. Særlig utbredt i øvre deler av avdelingen; i små legemer V vann 1053 og i noe større legemer over Evenesdal. Amfibolittene har til dels runde former og antas å være intrusiver. Gir frodig vegetasjon.

x) Antagelsen siden bekreftet.

Trondhjemitt(?)

Hvite til lys grå, middels kornige til finkornige, massive til svakere parallellstruerte bergarter finnes som tallrike små intrusiver i Skaitiskifrene.

TEKTONIKK

Feltets hovedstruktur er en antiklinal med akseretning VNV - ØSØ og med aksefall mot ØSØ. Antiklinalen er temmelig asymmetrisk, smal i SV, vid mot N og Ø. Syd for antiklinalens kjerne, basalgranitten i Krågdalen, faller bergartene mot S. Øst for granitten skjer der i de undre avdelinger en skarp ombøyning til fall mot Ø og NØ. I ombøyningsområdet er bergartene til dels sterkt foldet, med høyst skiftende fallretninger, således i Muorkiavdelingen nord for Tverrfjellet.

Ved kalkglimmerskiferens sterke ombøyning - vest for Åsfjell - er Muorkiskifer og kalkglimmerskifer foldet inn i hverandre. I Furulundavdelingen vil ombøyningen finne sted utenom feltet - nærmere Balvann.

Nord for Krågdalen er der sterk ombøyning fra fall mot NØ til fall mot NV. Dette området er meget sterkt foldet.

Foldene har for en større del akseretning NØ - SV, med aksefall mot SV. Foruten større folder har mange av områdets tallrike småfolder denne akseretning. I NØ-lige deler av området kan den flere steder tydelig sees å være en sekundær tverrfoldning. SV-ligst faller retningen sammen med hovedstrøket. En basalgneis som med overliggende bergarter danner en mindre antiklinal, har en tynn utløper i folderetningen, nederst bare ca. 10 m bred, men over hele strekningen med vel bevart antiklinalstruktur.

Sydligst i feltet er Skaitiavdelingen sterkt foldet. På Storfjellet er det flere mindre syn- og antiklinaler. Hovedstrøket i området synes her å dreie over mot S i utkanten av feltet. En større struktur er der SØ for Storfjellet. Strøket bøyer skarpt over fra ØV-lig til N-S, i vest med synform, i øst med anti-form.

Linjasjonen i feltet er fra Ø-V til ØNØ-VSV, med ensidig østlig fall i de østlige deler av feltet. Linjasjonen faller således omtrent sammen med hovedantiklinalens akse.

Fallet i bergartene er overveiende forholdsvis flatt, for det meste mellom 10° til 30°.

MINERALISERING

Feltet synes å være meget fattig på mineralisering.

I Sulitjelmamalmens nivå, nær toppen av Furulundskifrene er der SØ 1297 s. Storfjell på en ca. 5 m mektig rustsone sterkt forkislede bånd med fattig impregnasjon av svovelkis. Innen sonen er der bånd av hvit sericittskifer.

I Skaitiavdelingen er der ved S-enden av vann 1053 mellom s. Storfjell og Salefjell en tynn rustsone med meget fattig svovelkis-impregnasjon. Rustsonen kan følges mot V ca. 100 m, uten synlig mineralisering.

En litt høyereliggende rustsone går fra samme vann mot Ø langt oppover i Salefjell. Bare spredte kiskorn ses.

Litt i hengen av begge soner er der flere steder grov cyanitt på kvarts, og da dessuten begge soner ligger over diopsid(?)skifer. er det meget mulig at de opprinnelig har vært samme sone.

SAIMENLIGNING MED ØSTLIG FELT

Metamorfosen i Storfjellområdet er atskillig høyere enn i det tidligere på sommeren kartlagte område øst for Balmidalen.

Mest iøyenfallende er metamorfosestigningen i Muorkiskiferen. Denne skiferen har i øst, bortsett fra lokale avvik, en lav-metamorf mineralsammensetning med kvarts, muskovitt og kloritt, dessuten rikelig med magnetitt. I Storfjellområdet er kloritt og magnetitt erstattet av biotitt og granat. Mest fullstendig er denne omvandlingen vestligst (i undre Muorkiskifer), hvor også en del av muskovitten er forsvunnet. I østlige deler av området (øvre Muorkiskifer) er omvandlingen mindre fullstendig. Her opptrer kloritt, biotitt og granat i assosiasjon, samtidig som muskovittinnholdet er meget høyt.

I Furulundavdelingen viser metamorfosestigningen seg ved at skifrene i vest ofte er rike på granat, delvis hornblende, mineraler som ikke ble sett i det østlige felt.

Bare de underste av Skaitiskifrene ble studert i det østlige felt. De er forskjellige fra skifrene i Storfjellområdet. Mens det Ø for Skaitidalen er en meget markert forskjell mellom finkornige, lav-metamorfe Furulundskifre og grovere, høymetamorfe Skaitiskifre, ligner en større del av Skaitiskifrene i Storfjellområdet strukturelt på Furulundskifrene. Opptreden av cyanitt og spesielt diopsid viser imidlertid at metamorfosen har nådd meget høyt.

Rustsonene vest for Salefjell har ingen likhet med den mineraliserte sone øst for Skaitidalen.

Begge felt er antiklinaler med akse ca. Ø-V. Storfjellsantiklinalen har aksefall mot Ø, den østlige antiklinal har fall mot V. Den sydlige del av den østlige antiklinal har forbindelse med Storfjellsantiklinalen over et depresjonsområde i Balvann. I retningen N-S er Balvann derimot et kulminasjonsområde, mellom Baldosivve-synklinalen i N og Skaitisynklinalen i S.

Sulitjelma, den 26. oktober 1970

Sigbjørn Kollung
.....
Sigbjørn Kollung

| Page 1 | | 5. juli 1972 | | | |
|---|----------------------------------|--------------|-------------------------|-----------|-------|
| Proven fra Tjørnsletten, Bækkløst Jernvedel | | | | | |
| Nr. | Beskrivelse | Størrelse | Indhold | Koordinat | Antal |
| 1 | Kvartstener | M | 50cm NB højde 830 | 290276 | 14/8 |
| 2 | Lys, porfyriseret gl. skifer | Q.M | Vest Langsøen | 311297 | " |
| 3 | Mørk gl. skifer | Q.M | 100m ØSØ 1031. i Skib | 309283 | " |
| 4 | Fintjerning bækkløst | P(3) | flaet i Kongsdal | 260278 | 17/8 |
| 5 | Brun gl. skifer | U | — " — | 259280 | " |
| 6 | Lys kvartstener | U | — " — | 257280 | " |
| 7 | Granit | B | — " — | 254282 | " |
| 8 | Marmor | P | Stude Kongsdal | 251276 | " |
| 9 | Brun granat gl. skifer | Q.M | 200m NB højde 845 | 250275 | " |
| 10 | Brun granat gl. skifer | Q.M | 500m SE højde 820 | 266272 | " |
| 11 | Lys granat gl. skifer | Q.M | 500m ØNØ højde 836 | 292274 | 14/8 |
| 12 | Lys granat gl. skifer | Q.M | 700m nord Tjørnslet 966 | 299272 | " |
| 13 | Kalk gl. skifer, brun | K | 700m NB Tjørnslet 966 | 300271 | " |
| 14 | Amfibolit | K | — " — | 300271 | " |
| 15 | Kvartstener | K | — " — | 300271 | " |
| 16 | Brun kalk gl. skifer | K | — " — | 301271 | " |
| 17 | Brun kalk gl. skifer | K | 650m NB " — | 302270 | " |
| 18 | Brun gl. skifer | K | 800m ØNØ " — | 305268 | " |
| 19 | Brun kalk gl. skifer | K | — " — | 305268 | " |
| 20 | Fintjerning brun gl. skifer | Q.F | 900 ØNØ " — | 306267 | " |
| 21 | Fintjerning, brun gra gl. skifer | Q.F | 1200m Ø " — | 308265 | " |
| 22 | Amfibolit | Q.F | 1200m ØSØ " — | 308264 | " |
| 23 | Glimmeret granit | Q.F | 1200m ØSØ " — | 308264 | " |
| 24 | Brun, fintjerning gl. skifer | S | 1200m ØSØ " — | 308263 | " |
| 25 | Lys gl. skifer | S | 1200m ØSØ " — | 308263 | " |
| 26 | Diopsid(?) gl. skifer | S | 1200m Ø " — | 307260 | " |
| 27 | Bündel kvartstener | S | 1200m Ø " — | 307259 | " |

| | Beskrivelse | Sted | Struktur | År | Ref. |
|----|------------------------------------|------|----------------------------|-----------------------------|------|
| | Trondhjemst 13 | S | 800m Nt vann 1053 | 304254 | 24/8 |
| 29 | Opus (13) gl. skifer | S | — " — | 304254 | " |
| 30 | Kvartærskifer ? | ST | 1000m SSt Trondh 966 | 307263 | " |
| 31 | Blommest. skifer | U | V Långhammarer | 250296 | 24/8 |
| 32 | Blommest. skifer | P | Vestligst på n. Skarvill | 251303 | " |
| 33 | Gl. skifer, bånd i kvartærskifer | P | — " — | 251303 | " |
| 34 | Granatgl. skifer | u.F. | 1000m SSt n. Skarvill 1053 | 272289 | " |
| 35 | Kalkgl. skifer | P | 600m SSt — " — | 263300 | 24/8 |
| 36 | Marmor | P | 550m Nt — " — | 266303 | " |
| 37 | Finkornig lys grus | B | NV Långhammarer | 246302 | " |
| 38 | Gl. skifer, bånd i kvartærskifer | M | 400m Nt bryde 836 | 290273 | 24/8 |
| 39 | Blk. Kalkgl. skifer | K | 700m VSV Trondh 966 | 290267 | " |
| 40 | Amfibolit | S | — " — | 290263 | " |
| 41 | Mørk, finkornig gl. skifer | u.F. | 750m SV — " — | 292260 | " |
| 42 | Brunn gl. skifer | u.F. | 800m SV — " — | 292259 | " |
| 43 | Stentgl. skifer | u.F. | 3000m St n. Skarvill 1031 | 306277 | 24/8 |
| 44 | Brunn kvartærskifer | M | 500m VSV Nende Langv. | 302300 | " |
| 45 | Granatgl. skifer | u.F. | 700m N. S. Skarvill 1338 | 282256 | 24/8 |
| 46 | Mørk, finkornig gl. skifer | u.F. | 800m Nt — " — | 288257 | " |
| 47 | Brunn, finkornig gl. skifer | S | 900m SSt — " — | 291248
288249 | " |
| 48 | Lys gl. skifer | S | 900m SSt — " — | 291248
288249 | " |
| 49 | Trondhjemst | S | 900m SSt — " — | 291248
288249 | " |
| 50 | Lys gl. skifer | S | 900m SSt — " — | 291248 | " |
| 51 | Brunn, finkornig gl. skifer | S | 400m SSt vann 1053 | 293241 | " |
| 52 | Lys, båndet gl. skifer, grus | S | 550m S vann 1053 | 297238 | " |
| 53 | Blk. finkornig amfibolit | S | — " — | 290238 | " |
| 54 | Brunn, finkornig gl. skifer | S | — " — | 295238 | " |
| 55 | Kvartærskifer bånd i kvartærskifer | u.F. | 500m SSt 2047, Skarvill | 277252 | 24/8 |

| Object | Sten
art | Locality | Coord. | Alt |
|---|-------------|-----------------------------|--------|------|
| Brown skifer | S.F. | 600 m N of 1297 s Skrifhell | 277252 | 27/8 |
| 57 S-ls & fossilifer skifer | S.F. | ———— " ——— | 277252 | " |
| 58 Brown pyritifer | S.F. | ———— " ——— | 277252 | " |
| 59 Brown det gl. skifer | S.F. | 700 m N of 1237 s Skrifhell | 257258 | " |
| 60 Lys. fossilifering gneis | M | 900 m SV höjden 820 | 261268 | " |
| 61 Brown gl. skifer | M | 700 m S höjden 820 | 267266 | " |
| 62 Granatkl. det gl. skifer | u.M. | 500 m SV 1030 n Skrifhell | 290298 | 27/8 |
| 63 Kalkakt Kongemaret? | q.M. | 600 m V höjden 963 | 298308 | " |
| 64 Finkornig glimmer melasandsten? | F | 700 m N höjden 963 | 305315 | " |
| 65 Amphibolit, skifring | F | 500 m Q Barzjanne | 301321 | " |
| 66 Kalkakt amphibolit | u.M. | 900 m N of 1105 n Skrifhell | 276302 | " |
| 67 Kyanitt på kanten | S | 200 m SV S-ende vann 1053 | 295242 | 26/8 |
| 68 Brown, pink. gl. skifer med S-ls | S | 1000 m S of vann 1053 | 305237 | " |
| 69 Blå kvartsskifer | S | 500 m SV — " — | 293240 | " |
| 70 Dropsid bergart? | S | 900 m VSV — " — | 286241 | " |
| 71 Återgl. skifer | u.F. | S Åshell | 323277 | 27/8 |

Stratigrafi

S = Skårhärder

q.F. = Gfene Furubergsd. d.

u.F. = Undre — " —

K = Kalkglimmer skifer

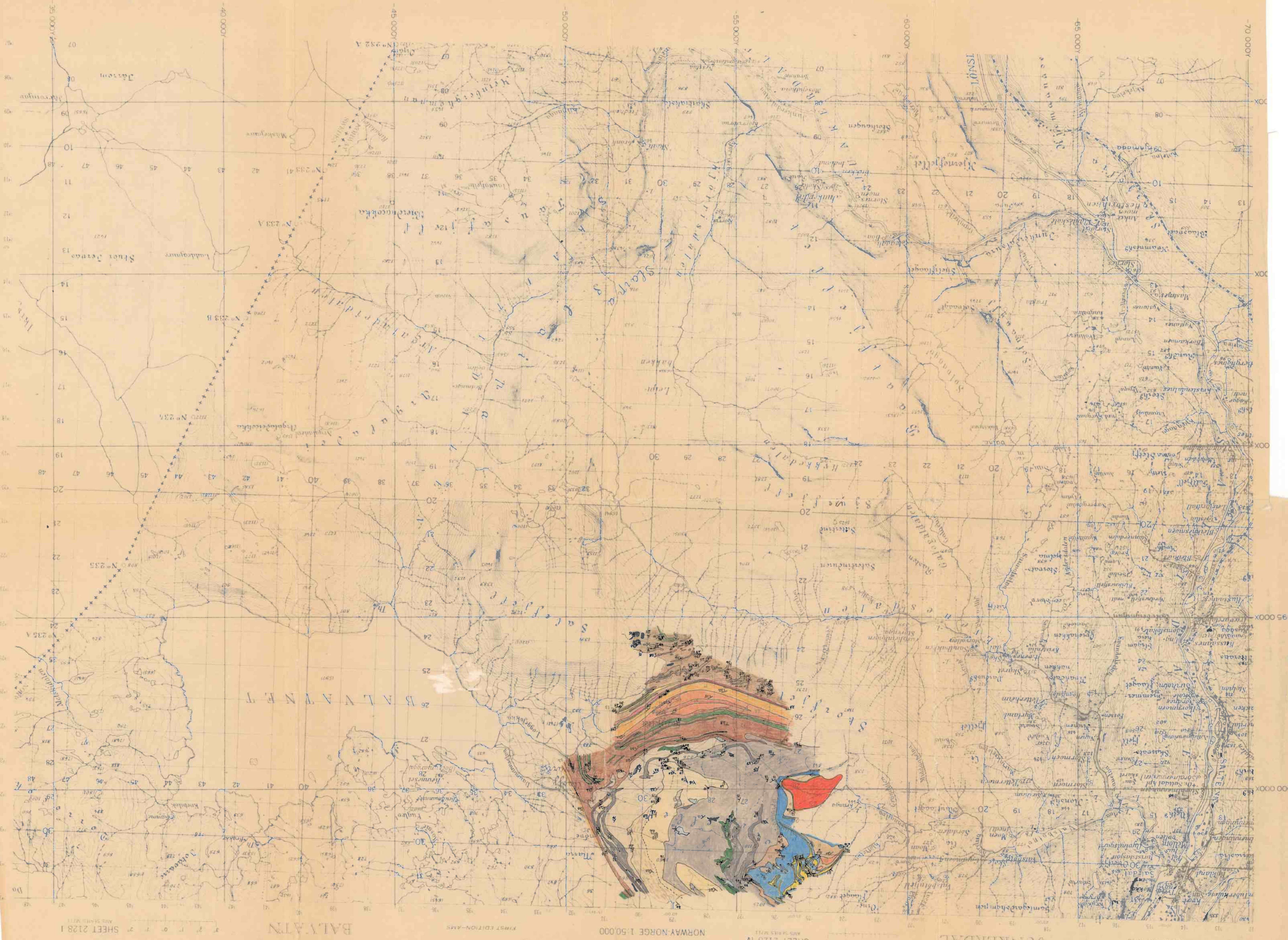
q.M. = Gfene Mörkberg d.

u.M. = Undre — " —

P = Prestvick d.

U = Undre glimmer skifer

B = Brannberg d.



SHEET 2128 I

BALVATN

FIRST EDITION-AMS

NORWAY-NORGE 1:50,000

SHEET 2128 IV

JUNKERDAL

FIRST EDITION-AMS

GEOLOGISK KART OVER STORFJELLSOMRÅDET VEST FOR BALVANN

- | | | |
|---|-------|---|
|  | 45 | Amfibolitt |
| Skaitiavdelingen | | |
|  | 61 | Brun, finkornig glimmerskiifer i veksling med grå glimmerskiifer. Rusten. |
|  | 56 | Grå glimmerskiifer (-gneis) |
|  | 53 | Diopsidglimmerskiifer |
|  | 1 | Kvartsitt |
|  | 21 | Trondhemitt |
| Furulundavdelingen: | | |
|  | 15 | Glimmerrik gneis |
|  | 59 | Øvre skiifer : Finkornig brun glimmerskiifer |
|  | 62 | Undre skiifer: Finkornig mørkegrå til brun glimmer-skiifer, ofte porfyroblastisk. |
|  | 64 | Grovere brun glimmerskiifer |
| Kalkglimmerskiifer: | | |
|  | 63 | Kalkglimmerskiifer |
|  | 69 | Grafittskiifer |
|  | 9 | Kvartsskiifer (feltspatrik) |
| Muorkiavdelingen (Sjønstå): | | |
|  | 70 | Øvre skiifer : Grå granatglimmerskiifer, delvis klorittrik. |
|  | 9 | Kvartsskiifer (feltspatrik) |
|  | 70, 9 | Kvartsskiifer og grå granatglimmerskiifer i veksling |
|  | 70 | Undre skiifer: Øverst delvis grå, ellers brun granat-glimmerskiifer. |
|  | 69 | Grafittskiifer |
|  | 9 | Finkornig, lys gneis |
|  | 37 | Marmor |

Pieskiavdelingen



Marmor



Kalkglimmerskiifer



Glimmerkvartsitt med bånd av glimmerskiifer



Finkornig, mørk gneis

Undre glimmerskiifer:



Brun glimmerskiifer



Kvartsitt

Basale bergarter:



Finkornig, lys gneis



Granitt

r-r

Rustsone

V₃₀

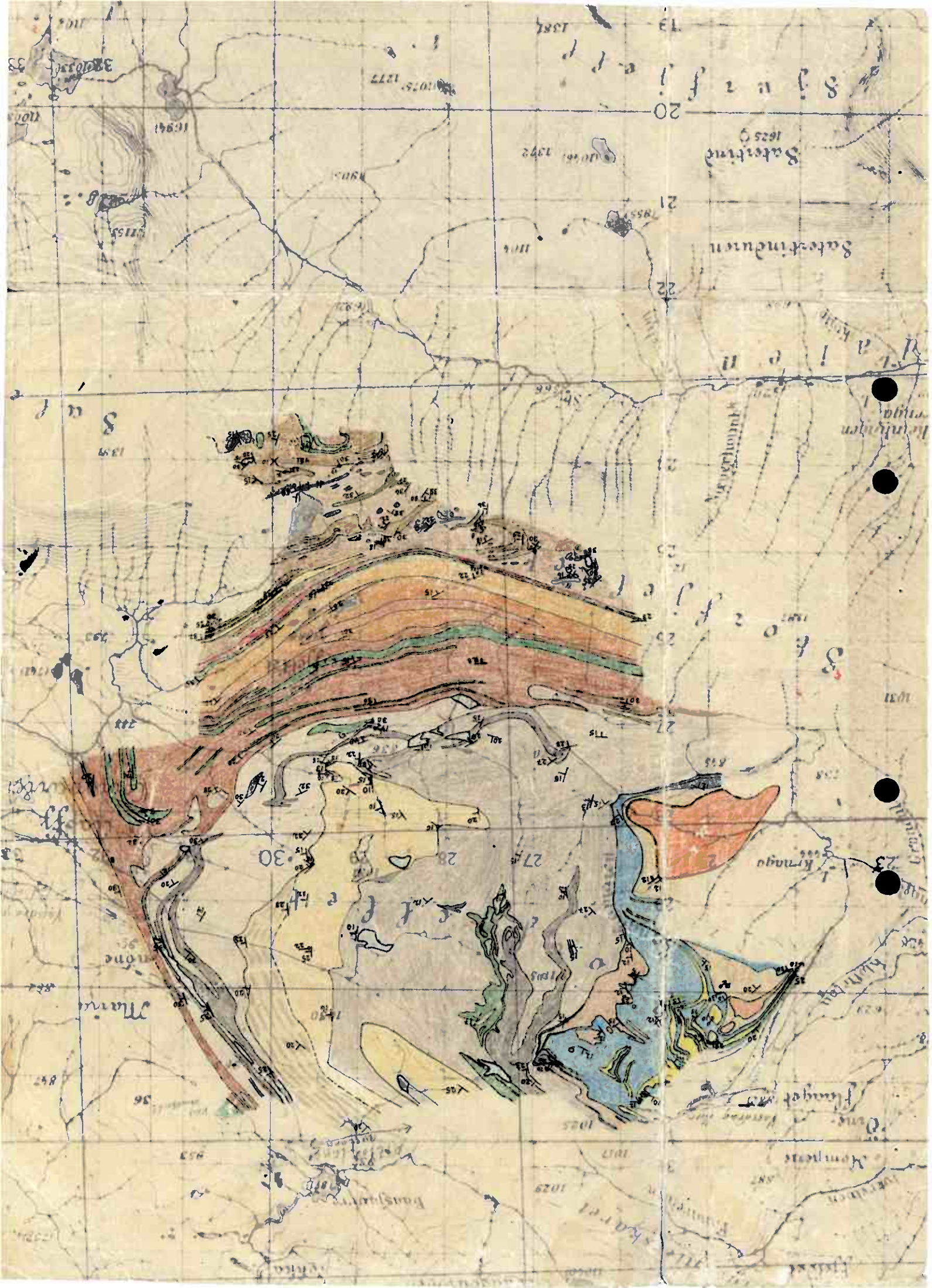
Strøk og fall

L₁₀

Linjasjon med fall

F₁₀

Foldningsakse med fall



Kodak 1970

Tunkardal