

Section 3 - Petrology

TR7-102-106

27. PETROLOGICAL NOTES ON SPECIMENS FROM VARIOUS LOCALITIES

by G. Everard.

MT ARROWSMITH AREA

The following rock specimens were collected by Geologist A. B. Gulline:—

62-1. *Lyell Highway 100 yards from Tiger Creek.*

The specimen is a pale grey, fine grained, quartzose rock, very strongly sheared and with a little sericite in the closely spaced shearing planes.

In this section the shearing is well shown by discontinuous thin curved bands of sericite along which the rock tends to part in cutting. The sericite bands partly enclose lenticular areas consisting of irregular quartz grains about 1 mm across showing undulose extinction and partial recrystallization, in a groundmass of very fine grained recrystallized quartz. A very small amount of ilmenite is present in scattered grains. Some of the larger quartz grains contain closely spaced lines of bubbles at right angles to the schistosity.

The rock is a quartz schist.

62-2. *Tiger Creek, Lyell Highway.*

The specimen is a white sheared rock, S.G. 2.76, effervescing freely with acid in the cold.

In thin section the rock is a mass of interlocking crystals of carbonate, the average grain size being of the order of 0.01 mm with some crystals as large as 0.2 mm across. The shearing is represented by occasional bands of fine talc. A few grains of quartz with undulose extinction may be seen.

62-3. *Lyell Highway $\frac{1}{4}$ mile from Tiger Creek.*

Pale grey fine grained sheared rock, with soft pale greenish foliated material in the shear planes. The specimen effervesces freely with acid in the cold. S.G. = 2.68.

In thin section the rock is a mass of fine grained carbonate, with patches of coarser grained material where the crystals are up to 0.25 mm in length. The mineral in the shear planes is talc, mixed with minute grains of carbonate. Quartz occurs as a few small patches of mosaic.

62-4. *Lyell Highway, $\frac{1}{4}$ mile from Tiger Creek.*

Fine grained grey rock with numerous dark and pale coloured inclusions and grains of quartz. S.G. = 2.72.

In thin section the rock is a mass of fine grained interlocking carbonate crystals. The dark inclusions consist of talc with very fine grained quartz. The pale coloured inclusions consist of very fine grained carbonate. Altogether the rock has a granular appearance somewhat obscured by shearing.

Specimens Nos. 2, 3 and 4 seem to be all dolomitic limestones. The differences in hand specimen are distinct, but in thin section they are much the same. Specimen No. 4 differs from the other two in not being sheared to anything like the same extent. Specimen No. 2 differs from Nos. 3 and 4 in being white whereas the other two are grey, but the difference in colour seems to be merely a matter of finer grain size, Nos. 3 and 4 being somewhat coarser and containing more recrystallized carbonate.

62-5. *One mile north of King William Saddle.*

The specimen is a fine grained, greyish green rock with dark green irregular inclusions up about 3 or 4 mm. long.

In thin section the rock is a structureless mass of interlacing needles of actinolite and granular albite, sometimes showing twinning. Apatite is plentiful in small prisms showing fractures, and opaque white leucoxene after ilmenite is fairly common.

The dark green inclusions consist of serpentine and chlorite with some remaining hornblende. They are probably the product of original phenocrysts of pyroxene.

The rock is a hydrothermally altered gabbro or dolerite.

MIDDLESEX PLAINS

The specimens described hereunder were collected by Geologist R. Jack near the junction of the old Van Diemens Land Company road and the road to Cradle Mountain.

62-9. Light coloured, fine grained, sheared rock with phenocrysts of quartz and pinkish feldspar up to 2 or 3 mm across.

In thin section the shearing is strongly in evidence in an even grained groundmass of quartz feldspar and sericite, the grains averaging about 0.02 mm across. Quartz phenocrysts are euhedral to rounded and corroded grains, very often fractured and showing undulose extinction. Feldspar is in anhedral grains sometimes shattered and showing strain. Occasional grains show ill defined lamellar twinning, with refractive index below that of Canada balsam and positive biaxial figure. These have been diagnosed as albite. Orthoclase also occurs in grains without twinning, giving a negative biaxial figure.

Under crossed nichols vague palimpsest structures appear in the matrix.

The rock has probably had a somewhat complicated history, but is probably best described as a porphyroid.

62-8. This rock does not differ significantly from the previous specimen. The matrix is a little more uneven with patches of a slightly coarser granularity. It has been weathered with the development of a reddish colour due to limonite.

PENGUIN

The following specimens described were collected by Geologist K. L. Burns at Penguin:—

62-349. Dark grey, fine grained rock, with dark and light phenocrysts about 2 mm across. Some dark phenocrysts have light borders.

In thin section the texture is markedly porphyritic, the rock consisting of a fine grained feldspathic groundmass, with particles averaging 0.05 mm across, in which are rather thinly scattered, phenocrysts of feldspar averaging 2 mm across.

The phenocrysts show simple and compound twinning; but are almost completely pseudomorphed by a yellowish brown sericite.

The matrix is a mosaic of yellowish brown mica, feldspar, cloudy with alteration, and fresh, untwinned anhedral albite.

The rock is a porphyrite.

62-350. Porphyritic rock with white, green and white and green mottled phenocrysts in an aphanitic brick-red matrix.

In thin section the rock consists of altered phenocrysts of albite showing simple and lamellar twinning in a very fine grained crystalline matrix consisting of albite, clinozoisite, chlorite and carbonate. The phenocrysts themselves are largely altered to these same minerals, which accounts for the green and white colours seen in hand specimen, while the feldspar of the matrix is a cloudy pink colour.

The rock is a metamorphosed albite porphyrite.

62-351. Medium grained, even textured, leucocratic rock containing crystalline quartz and feldspar and a minor amount of opaque black material.

In thin section the rock consists of euhedral feldspar crystals, 2 or 3 mm long, completely converted to carbonate, or to tufted or irregular small flakes of sericite; anhedral and recrystallized quartz with numerous inclusions and sparse irregular grains of ilmenite, largely altered to leucoxene. The texture is generally granular with much fine grained interstitial material composed of minute crystals of the same minerals.

62-352. Medium grained, even textured, holocrystalline rock, similar to the last specimen, but with a slightly higher colour index.

In thin section the texture is hypidiomorphic granular with subhedral zoned and altered plagioclase, irregular quartz and small laths and larger ragged crystals of pale green pleochroic tremolite. Sphene is associated with the tremolite in irregular red brown pleochroic crystals. Loose aggregates of minute pyrite crystals are common.

62-357. Pale grey, dense, very fine grained bedded rock, with visible bedding planes about $\frac{1}{8}$ " apart. The rock has irregular yellowish brown stains and concentric solution bands. Indefinite very fine veinlets cut across the bedding and are marked by traces of brown iron oxides.

In thin section the rock is a mass of suborientated flakes of sericite and quartz. Opaque clay minerals also occur.

The rock is a sheared mudstone.

62-358. Pale coloured fragmental rock made up of siliceous fragments averaging 2 mm across, with fine grained yellowish interstitial cement.

In thin section the rock consists of angular fragments of cryptocrystalline silica aggregates, with varying amounts of sericite in a fine grained sericite matrix. There are also a few fragments of recrystallized quartz and some semi-rounded quartz grains.

The rock is a silicified breccia.

62-359. Fine grained, pale coloured siliceous rock irregularly stained by iron oxide. The outline of angular fragments may be seen but generally such outlines have been largely obliterated and the rock has a homogeneous appearance.

In thin section the rock consists of microcrystalline quartz and sericite. The texture is not entirely uniform, but changes gradually giving a preponderance of quartz or sericite. There are a few angular fragments sharply defined by slight changes in texture, and some quartz veins stained with colloidal iron oxides, that show a somewhat coarser mosaic. Some veins consist entirely of iron oxides for some part of their length.

The rock is probably a silicified breccia.

MT BARROW AREA

The following describes a rock specimen collected by Geologist M. J. Longman near Camden Sawmill:—

62-363. The specimen is a medium grained rock consisting of dark green crystals of hornblende and opaque white feldspar, some of which is discoloured to a brownish pink.

In thin section the texture is panidimorphic and the minerals present are feldspar and hornblende, with accessory magnetite and apatite and a little secondary carbonate.

The hornblende is fairly fresh with but slight alteration to chlorite. It is pleochroic with Y = greenish brown, X = olive green and absorption $Z > Y > X$.

Most of the feldspar is brownish and cloudy and much sericitized. There is some fairly fresh labradorite with compound twinning.

Magnetite and apatite occur as smaller euhedral crystals and there is a little carbonate.

The rock is a lamprophyre.

DIAL RANGE

The following are descriptions of specimens collected by Geologist S. M. Rowe from the breccia beds underlying the ore-bodies of the manganese deposits at the Dial Range:—

62-435. This rock consists of angular to sub-rounded fragments of a siliceous mudstone, sometimes showing fine bedding planes. The fragments vary from about 10 mm across down to very small fragments of less than 1 mm. There is a little dark material filling the interstices between the grains. This material consists of cryptocrystalline silica and iron oxides, including fine scales of hematite.

The rock is quite obviously of sedimentary origin.

62-434. This specimen is similar to the above but does not contain any fragments larger than about 3 mm. It is stained a dark brown by limonite, both fragments and matrix, except that the stain has not penetrated the more siliceous fragments nor to the centres of the larger ones.

GORDON RIVER, SOUTH OF EAGLE CREEK

The following are descriptions of rocks collected by Geologist S. Rowe on the Gordon River:—

62-478. Underlying the limestone, Gordon River, East bank, 3 miles south of Eagle Creek, 37060E/76970N Pillinger.

The specimen is a pale coloured, fine grained, dense white sandstone, friable on weathered surfaces.

In thin section the rock consists of interlocking angular grains of quartz, averaging 0.1 mm across. Hematite, some of it pseudomorphous after magnetite, is common and gives a pink colouration. There are rare rounded grains of tourmaline and pink zircon.

62-479. Gordon River, 3 miles south of Eagle Creek, 37040E/76950N Pillinger.

The specimen is a finely bedded, fine to medium grained, bluish-grey limestone. Grains about 1 mm across are common, and a mottled effect has resulted from replacement and recrystallization. Pale coloured coarsely recrystallized calcite is common.

In thin section the rock consists principally of a dense interlocking mass of minute calcite crystals. Anhedral crystals of calcite averaging 1 mm across are common and these tend to have rounded, elongated outlines parallel to the bedding. These rounded grains are often associated with fragments of very fine grained quartzite. The quartzite grains are the grains visible in hand specimen, but in thin section they appear with very irregular outlines suggesting corrosion.

The limestone may have been laid down as a fragmental one, but the original structure has been almost obliterated by subsequent recrystallization.

62-480. Overlying the limestone 800 feet west of Gordon River, 3 miles south of Eagle Creek, 37020E/76970N Pillinger.

The specimen is a pale grey, fine grained, friable, bedded rock, weathering to a yellow or light brown.

In thin section it is a mass of interlocking angular grains of quartz averaging 0.1 mm across. Grains of fresh feldspar are also present and some sericite.

The second specimen is a dense, fine even grained grey rock.

In thin section it is a mass of interlocking grains of calcite, quartz, feldspar and a little sericite.