PETROGRAPHIC DESCRIPTIONS OF ROCKS COLLECTED AT COX BIGHT

The following petrographic descriptions apply to rocks collected by Regional Geologist M. Stefanski at Cox Bight. In general the series consists of siliceous and aluminous sediments, such as impure sandstones and shales, etc. that have been regionally metamorphosed. Nos. 11, 15 and 18, 19 are of basic igneous rocks forming part of the metamorphosed series, No. 1 is an igneous rock which intruded the series after metamorphism. There is some evidence of silicification in quartz veins and minute quartz stringers in some specimens.

No. 1 S.E. beach, W of Eric Point, opposite Cox Bight Camp:

Medium grained grey rock with felspar phenocryst up to 10 mm. across. A few irregular masses of quartz of similar size are visible together with dark needles of hornblende.

In thin section the groundmass has panidiomorphic texture and consists of minute needles and wisps of hornblende in a mass of felspar crystals. The felspar crystals are of two kinds, some lathlike with lamellar twinning identified with andesine, others stumpy with simple or no twinning and zoned so that the extinction angle gradually increases from the periphery to the centre.

Phenocrysts are of hornblende and felspar, the latter so altered to opaque material that further identification fails.

The rock is a hornblende lamprophyre.

No. 2 Boat Harbour, East Bay Cox Bight, metamorphosed contact along fault:

Fine grained white quartzite. An effect of fine bedding is given by thin bands of sericite, which show crumpling and are not actually continuous. A little biotite is also present. The quartz is completely recrystallised and there are small short quartz veins (say a centimetre long and a millimetre wide) that cut across the lineation and suggest silicification.

The rock is a metamorphosed arenaceous sediment.

No. 3 South Peninsular, Cox Bight. R2/892:

Finely banded fine grained, pale greyish quartzite. The bands are apparently flat and continuous.

In thin section the rock is seen to consist of fine bands of sericite and graphite separating coarser bands of interlocking angular quartz grains. The quartz grains may be separated by thin interstitial layers of muscovite or muscovite and graphite. Many quartz grains seem to have grown by the peripheral crystallisation of additional silica.

Extreme crushing and mylonisation followed by recrystallisation is indicated by the flat banding. The rock was originally a siliceous sediment with some clayey and organic matter.

No. 4 Interbedded with black schists. Boat Harbour. Cox Bight:

Weathered pale greenish or brownish rock with abundant mica and lenses of quartz.

In thin section quartz is more abundant than would appear in hand specimen. The rock is strongly sheared and plates of mica wrap themselves around lenses consisting of grains of recrystallised quartz. Both muscovite and biotite are present, the latter somewhat altered to chlorite.

The rock is a quartz-mica schist and results from the dynamo-thermal metamorphism of an aluminous and arenaceous sediment.

No. 5 East Beach. Cox Bight:

Pale gray, fine grained quartzite, very similar to No. 3; but graphite is comparatively rare, and although the rock is finely banded in a similar way, it is more massive and less apt to cleave along the bands. Jointing is more conspicuous in hand specimen than with No. 3.

The rock is of similar origin to No. 3 but contains less organic and possibly more clayey material.

No. 6 Travers Creek. Cox Bight:

Very fine grained pale gray foliated rock, with fine banding.

The rock consists of quartz and muscovite, together with a little biotite slightly iron stained and rarely altered to chlorite. It contains micro-augen of recrystallised quartz grains.

The rock is a fine grained mica schist, developed by dynamo-thermal metamorphism from a fine grained aluminous sediment containing a few sand grains.

No. 7 Southern Peninsula. East Bay. Cox Bight:

Another variant of the rock formation represented by specimens 3 and 5. In this example muscovite is almost as plentiful as quartz and renders the rock soft and friable on weathering. Fine white clay must have been present in considerable amount in the original siliceous sediment.

No. 8 Micaceous Sandstone in Black Schist. Boat Harbour. Cox Bight:

Pale greyish quartz mica schist. The mica is either colourless or somewhat reddish brown and pleochroic.

In thin section the rock is seen to contain about equal amounts of quartz and mica.

The specimen probably represents a variant of the rock of which No. 3, 5 and 7 are facies. However, the specimen is much weathered and mega structures are difficult to see in hand specimen.

No. 9:

Gray schistose rock. In hand specimen the rock consists of elongated lenses of quartz 1 mm. or more, in thickness, between masses of mica.

In thin section the quartz lenses are seen to consist of masses of minute grains of quartz. However, some small lenses are flattened single crystals. Some andalusite occurs particularly associated with mica, as rounded grains showing cleavage and twinning. The muscovite plates are bent and folded on a minute scale. A few very small flakes of graphite occur in the masses of mica plates and give a dark colour to the rock.

The specimen is a quartz-mica schist. It illustrates the extreme dynamo-thermal metamorphism of a sediment containing about equal amounts of argillaceous and arenaceous material.

No. 10: Fault Zone, East Cox Bight:

Pale greenish grey foliated rock but stained brown with iron oxides.

In thin section the rock has a schistose structure with lenses of quartz mosaic and lenses consisting of single crystals of andalusite, wrapped round by muscovite mica, usually stained brown with iron oxides, together with a little biotite and chlorite.

The rock is an andalusite schist, and results from the metamorphism of siliceous and aluminous sediments.

No. 11 Cox Bight on route to Camp:

Medium to fine grained greenish gray rock with euhedral pink garnets about 1 mm. across. The rock is somewhat sheared.

Thin section shows porphyroblasts of garnet and zoisite in a fine grained granular ground mass of zoisite and hornblende. Quartz tends to be associated with garnet, and some garnets are associated with biotite. Possibly the garnet has been altered to chlorite and the biotite formed from chlorite, by further metamorphism.

The rock is a fine grained garnetiferous zoisite-hornblende schist formed by the metamorphism of a basic igneous rock, and hybridised by siliceous sediments.

No. 12 Stinking Bay, East Cox Bight:

The rock is a fine grained white quartzite with fine gray bands.

Besides quartz the specimen contains white mica and a little graphite, the alignment of which gives the finely banded appearance. This banding is due to metamorphic action rather than original bedding. The rock has been developed from a siltstone containing some organic and carbonaceous material.

No. 13 East Cox Bight Range:

Quartz sericite schist and quartzites.

These rocks are examples of the development of different types of rock from almost identical sediments under metamorphism. They contain quartz and sericite in pretty much the same proportions but in specimen 1 the laminae are crumpled whereas in specimen 2 they are almost planar. Specimen 3 is a coarser grained rock.

No. 15 Beach near mouth of Lagoon Creek Inlet, Cox Bight, West:

This specimen is similar to No. 11, but has been weathered and exhibits shearing to a greater extent.

No. 16 North of Cox Creek:

The rock is a quartzite containing pyrite and arsenopyrite. There is a little pale yellow staining on the rock; but this seems to be due to oxides of arsenic.

No. 17 Black Bluff:

Grayish rock with shining flakes of muscovite, lenses of quartz, and black laminae of graphite. The specimen is covered with small holes whence crystals have been weathered out, iron oxides sometimes remaining.

In thin section the texture is typically schistose and tightly folded on a minute scale. Muscovite stained with iron oxides and darkened by laminae of graphite is the most prominent mineral and encloses lenses of recrystallised quartz grains. Neither ilmenite nor rutile were observed.

The small holes filled with opaque limonite enclosing occasional minute grains of quartz, judging from their shape, must have contained crystals of garnet.

No. 18 Basic dyke, South East of Contact Bay:

Schistose greyish green rock, with white patches up to 5 mm. long which appear to be weathered crystals of felspar. Green crystals of amphibole showing lustrous cleavage faces, are of about the same size and render the rock rather coarse grained.

In thin section the texture is xenoblastic. The large felspar crystals are weathered to opacity; but smaller irregular crystals and grains are quite fresh. Hornblende appears in laths and irregular distorted crystals pleochroic in green to brown. There is a little garnet in irregular grains and zoisite or clinozoisite is fairly common.

The rock is a hornblende-zoisite schist, and is probably a metamorphosed basic igneous rock.

No. 19 Basic dyke halfway between Contact Point and Red Bay:

Medium to coarse grained greyish green schistose rock, containing bladed crystals of hornblende.

In thin section a poikiloblastic texture is shown, with large crystals of hornblende containing inclusions of zoisite, epidote, felspar and garnet. Veins of zoisite or clinozoisite cut through the large crystals of hornblende, otherwise the texture is a confused granoblastic aggregate. Garnet is xenoblastic.

The rock is a garnetiferous hornblende zoisite schist and has probably originated as a basic igneous rock.

No. 21 Red Point:

The rock is a garnetiferous mica schist. It has been much weathered and discoloured. Both muscovite and biotite are present, but biotite has suffered alteration in weathering, releasing oxides of iron. These when mixed with clayey and micaceous material in the weathered rock result in a reddish powder. The rock itself is probably the result of dynamo-thermal metamorphism of iron bearing sediments, such as an impure ferruginous sandstone.

No. 22 Red Point, West:

Mica schist containing almandine. No magnetite was found.

No. 23 Scrub Point:

White finely banded quartzite. White mica appears on flat cleavage planes forming the top and bottom of the specimen, and the banding results from a small amount of white mica in the quartzite itself, aligned under directed pressure.

No. 24 Ray River tin workings:

Quartz vein in quartzite mineralised with iron pyrites. The pyrite has been oxidised in places leaving brown limonite, but in most instances the pyrite has been completely weathered out leaving negative cubes and boxworks of silica.

No. 25 Upper Lenna Creek:

Dark grey banded rock, with crumpled bands, showing mica and quartz.

In thin section the rock shows foliation and crenulation. Lighter coloured bands consist of recrystallised quartz. The grains are angular, slightly elongated and aligned. Darker bands consist of biotite, muscovite and cordierite.

The rock is a schist which has been regionally metamorphosed, with development of foliation and recrystallisation, possibly followed by contact metamorphism and development of cordierite.

No. 26 Upper Lenna Creek:

Dark grey foliated and banded rock.

In thin section the specimen shows schistose structure with biotite and muscovite in a groundmass of recrystallised quartz. The banded appearance is due to graphite, and in the black bands are rounded crystals of chiastolite with graphitic inclusions.

The rock has been formed by metamorphism of an arenaceous rock, with carbonaceous and aluminous material included in it.

The rock is a graphitic schist.

No. 27 Ambrose Creek, North East of Bay River:

Two weathered and iron stained specimens, apparently of rocks represented by specimens 28 and 28a.

No. 28 Ambrose Creek:

Sheared, foliated greenish banded rock.

In thin section the specimen has a groundmass of fine grained recrystallised quartz, with aligned masses of bent plates of muscovite and biotite, partly altered to chlorite and stained with iron oxides. Rectangular somewhat rounded crystals of chiastolite up to ½ mm. across are plentiful. Some graphite is also present within the mica plates.

The rock is a chiastolite schist.

No. 28a Ambrose Creek:

Similar to No. 28, but without chiastolite.

Locality - East of South East Bathurst Harbour:

White quartzite with a great number of fairly evenly spaced holes up to 1 cm. long. They are placed so that the longest and shortest direction are the same for each hole. When the rock is cut through some holes are seen to be still completely filled with a fine granular material somewhat darker than the rest of the rock.

In thin section the rock has the structure of a sheared quartzite. There is a fine grained groundmass of quartz grains in which are porphyroblasts of quartz all oriented the same way as the holes. Where these holes still contain material it is of the same texture as the rest of the rock; but contains in addition dark carbonaceous material. These carbonaceous masses are softer and more susceptible to weathering than the rest of the rock.

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