



Petrology of some aboriginal artefacts and rocks from north-west Tasmania.

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Abstract

The rocks and artefacts are composed of a range of rock types, including Precambrian hornfels, chalcedony, carbonaceous chert, silicified basalt, and argillaceous chert. Sources suggested include the Smithton Dolomite, Tertiary basalt, Cambrian ultrabasic rocks, and Precambrian–Cambrian sediments.

INTRODUCTION AND DISCUSSION

Nine rocks and aboriginal artefacts, collected in north-western Tasmania by Ingereth McFarlane of the Department of Lands, Parks and Wildlife, were submitted for petrological identification and suggestions for probable provenance. All were possible artefacts excepting G400725, which was collected for comparison.

The samples are mostly rather impure cherts of sedimentary origin (silicified dolomite and argillaceous rocks of late Precambrian–Cambrian age, equivalent to the phthanites of Sutherland, 1972), with one hornfels (Precambrian metasiltstone) and two chalcedonic rocks from hydrothermally altered igneous rocks (silicified Tertiary basalt and Cambrian ultrabasic rocks?). The artefacts were probably all prepared from material of relatively local provenance, which is discussed with the rock descriptions below.

It is interesting to note that no 'spongolite' was identified, despite its abundance about 40 km to the south (Thomas and Van Eckart, 1989).

SAMPLE DESCRIPTIONS

G400721: Artefact scatter, Heazlewood River, 23/2/89 (TAS4260)

In hand specimen this rock is a very pale grey to off-white chert or chalcedony. The relative purity and chalcedonic nature indicate that it is probably derived from the chalcedonic to opaline silica present in the Cambrian igneous rocks of the Heazlewood Ultramafic Complex, covering a wide area immediately to the north of the Heazlewood River.

G400722: Mt Cameron West, Site 24, 2/4/89 (TAS 4091)

In hand specimen this rock is a silicified conglomerate with pale grey to off-white chert clasts in a slightly porous, pale brown cherty matrix. The rock is probably a silicified dolomite or limestone conglomerate. No outcrops of identical material are known in the area, but the artefact is probably derived from the Precambrian Smithton Dolomite, the lower part of which is commonly silicified and is widespread in the area (fig. 1).

G400723: Pieman Heads North, 2/5/89 (TAS 4262)

In hand specimen this rock is an off-white chert with numerous fine-grained, dark-coloured specks of unidentified clasts or minerals. In section the rock has a dark blue-grey core, progressively bleached and oxidised to brown and finally almost white. There are a few pores where material has been leached. The rock could be classified as a porcellanite.

In thin section the rock appears to consist almost entirely of microcrystalline silica, although X-ray diffraction indicates that feldspars are an important component of the rock. A small amount (about 5%) of the rock consists of very fine-grained chlorite, mica, epidote, and several unidentified minerals. The clasts contain limonite, chlorite, and leucoxene, suggesting an original mafic mineral or clast.

The petrography of the rock suggests that it is a silicified sediment or volcanic rock, although there are few definitive textures. N. J. Turner (pers. comm.) notes that similar siliceous rocks are common in the Corinna area, where they represent silicified Precambrian dolomite and are associated with the "silica flour" deposits.

G400724: Henty Dunes bone and artefact scatter, 8/3/89 (TAS 2554)

In hand specimen this is a khaki-green, well indurated rock, resembling a fine-grained impure chert or microquartzite. The fracture is rather hackly in comparison with the other samples, and no foliation is visible.

In thin section the rock is a metasiltstone, or a hornfelsed siltstone, of relatively coarse grain size. The rock consists dominantly of quartz, with subdominant feldspar (mainly orthoclase with some plagioclase), minor chlorite, sericite and leucoxene, and trace tourmaline and epidote. It is strongly indurated but weakly foliated, suggesting an hornfelsic origin.

Similar rock types are known to occur at Trial Harbour to the north of the sample area, where the Precambrian sediments have been hornfelsed by the intruding granite; this is likely to be the source (Sutherland, 1972).

G400725: Tayatea Road, GR 78 480 535 (Anne McConnell collection)

In hand specimen this rock (not an artefact) is a brecciated pale grey to black chert, with some fine banding and some small quartz veins. In thin section the rock is dominated by cherty quartz, with minor coarser vein-style quartz (in shrinkage cracks?), carbonate rhombs, and amorphous

carbonaceous material. The rock is typical of the silicified lower part of the Smithton dolomite in this area.

G400726: Mt Cameron West, Site 23, 2/4/89 (TAS 4090)

In hand specimen this rock is partly a black chert with a slightly granular texture, and partly a moderately porous white rock with a more granular to arenaceous texture. The latter part of the sample appears to be due to weathering of the black chert, and some sedimentary banding is present where the rock grades into the black chert.

In thin section the rock is dominated by cherty quartz, but also contains a large amount of carbonaceous material (?10%) and other very fine-grained minerals (including about 5–10% sericite, tourmaline, rutile and others, all crystalline). There are abundant lenticular, non-carbonaceous chert pseudomorphs, to ~0.5 µm, which completely replace gypsum (or perhaps some other evaporite mineral of similar morphology). Relatively coarse, rounded, detrital quartz is rare.

This rock is rather unusual, perhaps representing a hydrothermally altered or metamorphosed evaporitic sediment. It is remarkably similar to the "chert nectique" of Cayeux (1929), as described in Carozzi (1960). The tourmaline may have been derived from either low grade metamorphic alteration of borate-bearing evaporitic sediments, granite-related boron-metasomatism of sediments, or be a direct precipitate in volcanic-exhalative chemical sediment (Slack *et al.*, 1984). No directly equivalent rocks are known in Tasmania, although this specimen is superficially similar to the cherts in the Smithton Dolomite (see fig. 1 for possible locations).

G400727: Mt Cameron West, Site 25, 2/4/89 (TAS 4092)

In hand specimen this rock is a black chert, and X-ray diffraction indicates quartz as the only significant crystalline component. The rock was not examined by thin section but superficially resembles the black portions of both G400727 and G400725. It is less granular than G400727, and is probably a silicified dolomite from the Smithton Dolomite (see fig. 1 for possible locations)

G400728: Hoyles Ck. Track artefact scatter behind lagoon, 5/3/89 (TAS 4318)

In hand specimen this rock has a mottled, streaky brownish colour and a good conchoidal fracture, indicating an opaline or chalcedonic texture. Very small veins of white to pale blue quartz and chalcedony cut the rock. The rock is probably a silicified Tertiary basalt of local derivation (N. J. Turner, pers. comm.).

G400729: Artefact scatter, Heazlewood River, 23/2/89 (TAS 4260)

In hand specimen this rock is a mid grey to khaki coloured chert, with diffuse banding and a weathering rind of pale ochre-yellow material. In thin section the rock is composed predominantly of microcrystalline quartz, with approximately 5% of each of the following: vein quartz (in shrinkage cracks), chlorite, and white mica, with a trace of very fine grained titanium oxides.

The texture and mineralogy indicate that the sample is a banded argillaceous chert, probably a replaced argillaceous sediment. Similar rock types are locally common in the Crimson Creek-equivalent Precambrian–Cambrian sediments to the north of the Heazlewood River (N. J. Turner, pers. comm.).

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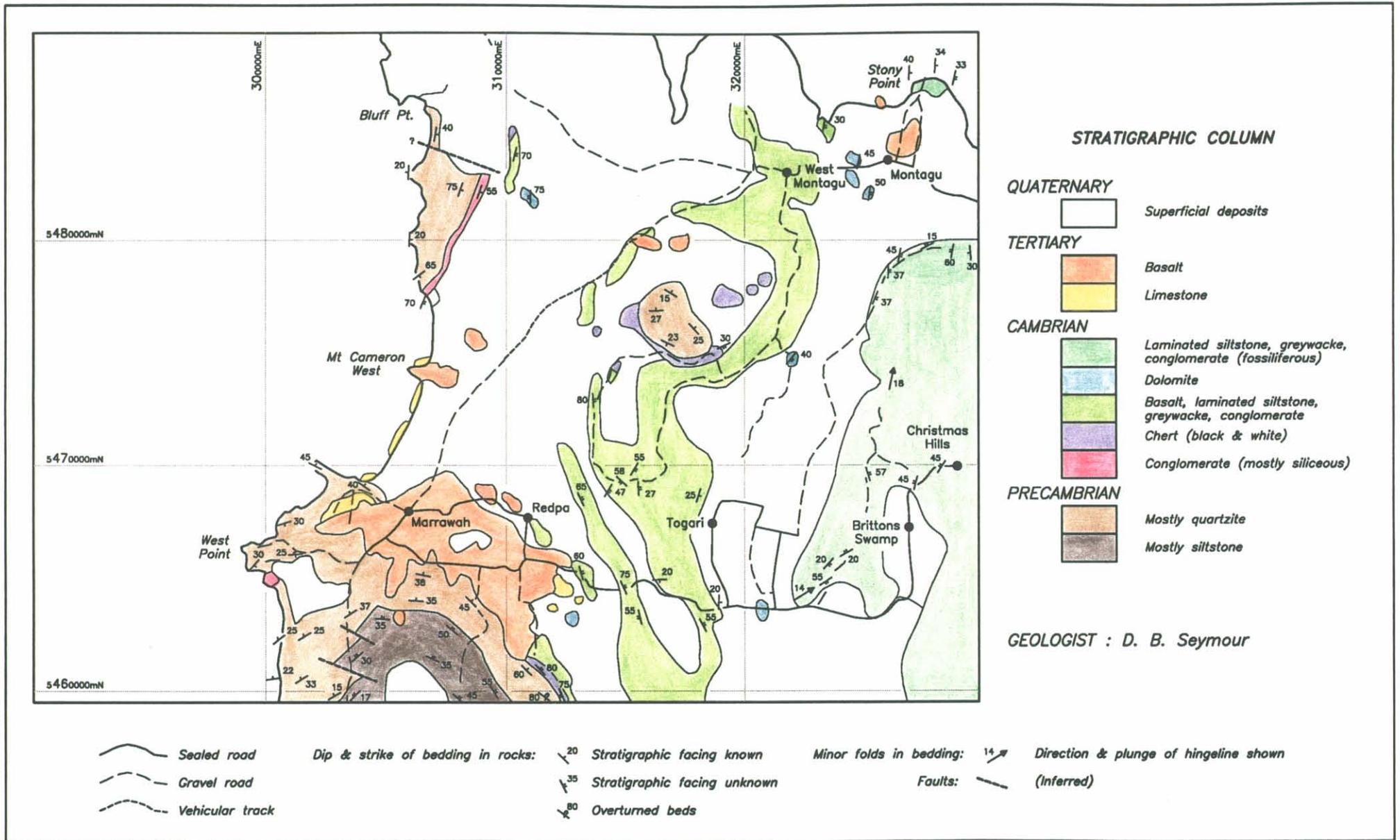


Figure 1. Geology of the Montagu-West Point area.