1976/49. Notes on the volcanic stratigraphy and Cambro-Ordovician relationships in the Mt Jukes area

K.D. Corbett

Abstract

The Mt Read Volcanics in the vicinity of Mt Jukes comprises two major sequences:

(1) A central rhyolite sequence dominated by pink to pale-coloured massive fine-grained rhyolite, showing well developed columnar jointing in places and characteristic micro-spherulitic texture.

(2) An eastern sequence of mixed quartz-feldspar-phyric lavas, pyroclastics and volcaniclastic rocks apparently overlying the rhyolites.

The copper sulphide mineralisation at Jukes Proprietary and Lake Jukes occurs either within the rhyolite sequence or at its contact with the eastern sequence. Lenses of coarse volcaniclastic breccia and conglomerate ('Jukes Conglomerate') unconformably overlie the central rhyolites on the north face of Mt Jukes, and grade upwards into siliceous conglomerate and sandstone of the Owen Conglomerate correlate. Elsewhere, it is difficult to distinguish 'Jukes Conglomerate' from the volcaniclastic rocks of the eastern sequence.

1976/49. Notes on the volcanic stratigraphy and Cambro-Ordovician relationships in the Mt Jukes area

K.D. Corbett

Detailed mapping of selected areas around the eastern and northern flanks of Mt Jukes [CP828298], on the West Coast Range, was carried out during February 1975 to determine the general stratigraphy of the volcanics and the relationships between units and with the overlying rocks. The mapping is part of a regional study of the Mt Read Volcanics aimed particularly at determining the stratigraphic setting of the volcanogenic mineralisation. Much work remains to be done, but the preliminary results are made available to assist in regional correlations.

Mapping was concentrated in the Lake Jukes area, which is accessible by a walking track from the Crotty Road, and in the Traveller Creek-Jukes Proprietary area, which is accessible via a bulldozed track which partly follows an old walking track along Traveller Creek.

Mt Jukes represents the crest of a broad anticlinal structure in Owen Conglomerate. Deep erosion of the eastern flank of this structure, mainly by cirque glaciers, has removed part of the conglomerate cover and exposed the underlying Mt Read Volcanics in two basins drained by Traveller Creek and Fish Creek. Excellent exposure of the central part of the volcanic sequence occurs on the north face of Mt Jukes down to the gorge of the King River.

The stratigraphy of the area may be summarised as follows:

Pleistocene-Recent. Moraine and scree.

Late Cambrian-Early Ordovician

(1) Owen Conglomerate.
(2) 'Jukes Conglomerate'.

Cambrian-?Late Precambrian

(3) Eastern sequence of quartz-feldspar-phyric volcanics and volcaniclastic rocks.
(4) Central rhyolite sequence.

CENTRAL RHYOLITE SEQUENCE

Jukes Proprietary area

The central sequence is best exposed west of the Jukes Proprietary adits, where it consists mainly of massive, fine-grained, pale-coloured or reddish-brown rocks which commonly have a sandy texture on weathered surfaces. The contact with the eastern quartz-porphyry sequence is subvertical, and is at least in part a fault, since it also displaces the base of the Owen Conglomerate. The Jukes Proprietary adits are located either on this contact or just west of it, within the rhyolite sequence. Copper mineralisation occurs as disseminated sulphides, with some rich zones of massive sulphide, within a red-weathering, strongly chloritised schistose zone near the contact. Part of the adjacent quartz-porphyry sequence has also been chloritised and mineralised near the contact.

A contact between brown-weathering, fine-grained rhyolite and reddish-brown breccia with fragments of rhyolite in a matrix rich in quartz crystals,

is exposed about 50 m east of Adit 3 (counted from top down). A thin section of the fine-grained rock occurring east of Adit 3 (75-242*) has the distinctive texture of other rhyolites further west, consisting largely of pink spherulitic structures which have a core of clear quartz. The quartz cores show a characteristic deeply embayed or corroded habit, giving them irregular or vermiform shapes. The pink feldspar 'bodies' of the spherulites are generally in optical continuity with the quartz cores. Boundaries between spherulites have been blurred by later cleavage and development of secondary chlorite-sericite wisps. Two foliations at about 60° are apparent in the secondary material. Large patches of the chlorite-sericite material, commonly with grains of oxide, are also present.

A rhyolitic agglomerate or breccia occurs within the rhyolite sequence adjacent to the contact in several areas. A sample taken from below the 'Jukes Conglomerate' high up on the spur consists of abundant small rounded fragments of brown rhyolite in a brown rhyolitic matrix. This rock resembles autobrecciated lava to some extent, and is similar to rocks referred to as 'rubble rocks' on Philosophers Ridge near Mt Lyell. Apparently underlying this unit is a different agglomerate containing wispy pale fragments, not unlike some of the ash-flow rocks of the Lyell area.

The red-weathering zone near the contact appears to grade into pink massive rhyolite approximately 100 m further west. In thin section (75-243) this rock consists of about 5% spherulites, 30% interstitial groundmass, 5% altered feldspar phenocrysts, large opaque grains and opaque dust, chlorite patches, polycrystalline quartz patches, and small quartz veins. The spherulites average 0.3-0.5 mm across, and have a large core of clear quartz and a body of pink, slightly murky, material. The quartz cores are deeply embayed and corroded single crystals (in places several crystals), some containing tiny inclusions of pale green mineral (chlorite?). A faint to moderately prominent radial structure is evident within the body of some spherulites in plain light. The body material is in optical continuity with the quartz core, so that all extinguish together except for more highly birefringent tiny flakes of what appears to be sericite. The composition of the body material is difficult to determine because of the fine-grained alteration products, but staining tests indicate it could be mostly potash feldspar. A rim of limonite-stained material surrounds the spherulites in some areas. The interstitial groundmass consists of fine green chlorite flakes, murky pinkish material (K-feldspar?), quartz, magnetite grains, and hematitic dust. The feldspar phenocrysts are up to 1.5 mm across and are partly to completely replaced by a fine felted mass of sericite and possibly carbonate. Less altered crystals give a positive reaction to potash stain.

The massive pink rhyolite passes west into pale-rhyolite which in places shows well-developed columnar-jointing. In the easternmost outcrop examined, the columns were slightly curved and had side widths of 10-20 cm, with a variation from 3 or 4 - sided to 6 - sided. The columns plunged NE at 65° (fig. 1), indicating a primary dip for the layer (assuming it was a flow) of about 25° to the SW. The second and larger exposure, about 400 m west of the rhyolite contact, shows columns 30-50 cm in diameter forming a low cliff on the crest of a spur. Most of the columns are 5 or 6 sided, but the sides are somewhat rounded in many cases. These columns plunge NE at 52°. In thin section (75-244) this rock is a spherulitic rhyolite similar to the previous example, although many of the spherulites do not have quartz cores.

A dyke of quartz-feldspar porphyry occurs within the pale rhyolite sequence in a creek to the west of the above locality. The ESE-trending dyke

*Specimen numbers refer to Department of Mines collection.

is about 5 m thick. A larger NNE-trending dyke, about 10 m wide, is truncated by the 'Jukes Conglomerate' on the NW slope of Proprietary Peak, 200 m higher then the ESE-trending body. This dyke also intrudes pale rhyolite and has xenolithic fragments of rhyolite near the contact. The dyke rock is pale green in colour, becoming purplish near the contact with the overlying breecia. It contains numerous large quartz crystals, up to 1 cm across, in a pale, altered groundmass, and resembles a weathered granite. In thin section (75-245) the large quartz crystals are deeply embayed and 'float' in an abundant very fine-grained dusty groundmass. Large crystal-shaped masses of felted sericite, apparently representing feldspar phenocrysts, also 'float' in the groundmass. There is no granite-type crystal intergrowth and the rock has the characteristics of a volcanic porphyry.

Lake Jukes area

Brown-weathering, closely-fractured, fine-grained rock, with some intercalated breccia, forms a prominent bare knob east of Lake Jukes known as 'Adit Knob'. This rock type forms a sharp wedge extending SE from the knob, and is bordered by the quartz porphyry sequence. The southern contact, which is exposed near a waterfall on the outlet creek from Lake Jukes, is sharp and linear, trending 122° (True) and is probably a fault. The contact along the NE boundary is marked by a breccia containing abundant fragments of the fine-grained rock in a matrix rich in quartz crystals, and this contact is probably sedimentary.

Four adits and several trenches are located within the rhyolite at Adit Knob, and the remains of a 5-head battery stamp occur nearby. The upper two adits were driven along rich bornite-hematite veins, but these did not persist in depth, and the lower adits were apparently barren. Disseminated chalcopyrite also occurs within chloritised rock towards the top of the knob. The mineralisation appears to be entirely restricted to the rhyolite sequence except for some minor pyrite and chalcopyrite within a chloritic unit apparently within the eastern sequence, at Bean and Thow's prospect.

In thin section (75-238) the fine-grained rhyolite from the contact near the waterfall consists mainly of graphically intergrown quartz and pale pink murky feldspar largely replaced by sericite. The form of the quartz is similar to that forming the spherulite cores in the rhyolites of the Jukes Proprietary area, and the texture is strikingly similar to that which occurs in rock fragments in many units of the eastern sequence in the South Darwin area. A few large (up to 2 mm), very altered, feldspar phenocrysts also occur. There are large patches of hematitic material with remnant magnetite (?) grains and disseminated hematite is common within the groundmass and associated with magnetite along cracks.

EASTERN QUARTZ PORPHYRY-VOLCANICLASTIC SEQUENCE

Traveller Creek-Jukes Proprietary area

The sequence exposed from east of the Jukes Proprietary adits to the lower reaches of Traveller Creek consists mainly of quartz-porphyritic rocks, including tuffs, agglomerates, volcaniclastics and probably lavas. They are generally pale green or splotchy pink and green in colour, with a prominent cleavage. Outcrop is generally poor, and it has not been possible to map individual units or litholigies. Possibly the most abundant lithology has fragments of quartz-porphyry up to 10 cm in a matrix rich in quartz and feldspar, but massive non-fragmental types resembling lava also occur.

An apparently unfaulted contact with the central rhyolite sequence is exposed on a red knob about 50 m east of Adit 3. The contact is irregular

in detail and appears to lie east of the main fault. Brown-weathering fine-grained rhyolite to the west is in contact with a reddish-brown breccia containing numerous fragments of rhyolite in a matrix rich in quartz crystals. The contact suggests that the quartz-phyric sequence overlies the rhyolite sequence.

A specimen (75-240) of massive porphyry from about 300 m east of the rhyolite contact contains quartz phenocrysts and glomerophenocrysts, irregular elongated quartz-mosaic bodies, and scattered, completely altered, feldspars, in a foliated groundmass which is partly spherulitic. The spherulitic bodies are very small (0.1-0.2 mm), but many show good radial structure in plain light. This rock is probably a lava.

A specimen (75-246), from about 20 m below the base of the Owen Conglomerate correlate, NE of Proprietary Peak, is a volcaniclastic rock. It contains rock fragments of spherulitic rhyolite and quartz porphyry, as well as quartz and altered feldspar crystals, in a foliated brownish-green matrix rich in chlorite, sericite and small grains.

Volcaniclastic sandstone, siltstone and conglomerate underlies the Owen Conglomerate in the lower reaches of Traveller Creek. Bedding is apparent in a few places and dips moderately west. One easterly-facing was obtained, indicating that much of the sequence may be overturned. The rocks tend to be strongly cleaved, and the conglomerate beds characteristically contain stretched or flattened volcanic clasts. While it is possible that part or all of this sequence is a correlate of the 'Jukes Conglomerate', the discrepancy in dips with the adjacent Owen beds, and the occurrence in the sequence of quartz-feldspar-phyric tuffs, suggests it is more probably part of the eastern sequence.

Lake Jukes area

An interbedded series of quartz-bearing rocks, including pyroclastics, volcaniclastics, and banded and brecciated lavas, is well exposed along the track and on ice-scoured drumlins in the valley east of Lake Jukes. Good bedding in laminated sandstone just west of Bean and Thow's prospect dips SW at 60°, and cross-lamination suggests it is right way up. Flow-banding in lava in several areas to the west generally dips steeply west, but folds and local variations are common. The contact with the Adit Knob rhyolite is marked by a zone of breccia containing abundant fragments of fine-grained rhyolite in a matrix rich in quartz crystals. The contact appears to be sedimentary and may mark an unconformity or disconformity.

The Bean and Thow prospect is located within an unusual NW-trending band of chloritised, strongly cleaved, green agglomerate apparently lacking quartz phenocrysts. The unit is about 20 m wide and contains quartz-chlorite-pyrite veins and some minor pyrite-chalcopyrite, both disseminated and on cleavage planes. The western contact is an irregular, apparently-erosional surface overlain by quartz-rich tuff or volcaniclastic rock containing fragments of cleaved slaty material. The eastern contact is not exposed and may be faulted. It is possible that this is a sliver of basement material brought up by faulting.

The lowermost outcrops of the eastern sequence on the track are of massive, cleaved, greenish-grey to purplish tuff containing quartz and feldspar crystals and flattened small rock fragments. Tuff and agglomerate rich in quartz crystals, and interbedded with laminated tuffaceous sandstone, occur west of the Bean and Thow prospect. A quartz-feldspar porphyry (75-236) contains abundant large quartz and pink feldspar crystals, some of them

cracked and broken and annealed with carbonate, in a strongly-foliated matrix of fine quartz and feldspar, with large irregular plates of chlorite-sericite and abundant magnetite(?) grains.

A distinctive banded lava, in which the flow bands are separated by fine joints or cracks 2-3 cm apart,occurs where the track first crosses the outflow creek. South-west of this, the track skirts large drumlins with outcrops of autobrecciated lava containing angular and irregular blocks of pink quartz-feldspar porphyry up to 50 cm across in a paler groundmass of similar composition. To the west of this, the track follows a unit of pale green flow-banded lava for some distance towards Adit Knob. The banding is strongly folded in places, and again is marked by fine parallel joints. In thin section (75-237) this rock contains abundant, very altered feldspar phenocrysts and large to small, extensively corroded and embayed quartz phenocrysts in a very fine-grained murky groundmass. Flow lines are apparent in the groundmass in places. A high proportion of broken crystals is present. Carbonate, opaques, and fine chlorite are also present.

Several prominent brown outcrops of massive chloritic rock with quartz phenocrysts occur on the north-east flank of the valley, below the siliceous conglomerate forming the crest of Yellow Knob Spur. In thin section (75-239) the rock contains numerous small to large embayed and corroded quartz crystals in a strongly-foliated granular-looking matrix of quartz, feldspar, chlorite and hematite. Feldspar phenocrysts are apparently lacking.

Crudely-bedded volcaniclastic rock, containing rounded blocks up to 15 cm across in a quartz-rich matrix, occurs on the north-east shore of Lake Jukes and appears to dip west at about 40°. The cliffs which occur north of the lake in this area (below Central Peak), are considered to represent the type area of the 'Jukes Conglomerate' (Banks, 1962, p. 149), but the present investigation raises doubts as to the validity of this 'type section'. The base of the Owen Conglomerate is marked by a yellow-weathering, highly-cleaved zone of sandy shale, about one metre thick. There are abundant slickensides and quartz veins within this material, and the base appears to cut across bedding in the overlying rocks and is probably a fault zone. The underlying rock is massive, purplish and strongly cleaved, but lacks any obvious breccia or conglomerate texture. It is very rich in quartz crystals. An apparent unconformity is caused by the abrupt termination of the cleavage planes against the base of the conglomerate, but bedding is not apparent in the underlying rock. The only bedding seen was 36 m east of the base of the Owen Conglomerate, in volcaniclastic material dipping steeply west, but this could well be part of the eastern sequence.

'JUKES CONGLOMERATE'

Jukes Proprietary area

Coarse purplish volcaniclastic breccia-conglomerate conformably underlies the Owen Conglomerate and unconformably overlies the central rhyolite sequence on the north face of Proprietary Peak. From the original description of Hills (1914, p. 42) this could be considered the type area for his 'Brecciated conglomerate' division (later known as the 'Jukes Breccia' or 'Jukes Conglomerate'; Banks, 1962, p. 149) of the 'West Coast Range Conglomerate Series' (later to become the 'Owen Conglomerate'). It is the first area described by Hills in connection with this unit, and is one of the few localities where there is complete exposure and where the relationships at the upper and lower boundaries of the unit are unequivocal. Elsewhere, there is difficulty in distinguishing the unit from similar volcaniclastic rocks in the eastern sequence, and it is apparent that Hills did not make the distinction.

The conglomerate occurs as two separated bodies or lenses, the easternmost being truncated by the fault which forms the eastern boundary of the rhyolite sequence. The eastern lens has a maximum thickness of about 30 m and comprises a lower, massive, breccia-conglomerate unit and an upper bedded unit (about 6 m thick) of fine volcaniclastic conglomerate and partly siliceous sandstone. Conformably overlying this is a siliceous cobble conglomerate forming the base of the Owen Formation. Clasts in the lower part are sub-angular to rounded, and up to 30 cm across. The majority are rhyolite of various types (*e.g.* fine-grained, spherulitic, porphyritic, banded), but other rock types include red jasper, hematite and quartz-schist. Some of the rhyolite blocks show what appears to be a cleavage. Quartz-porphyry clasts were not seen, but volcanic quartz is scattered through the matrix. The base rests on massive purple to brown spherulitic rhyolite and on rhyolite autobreccia near the eastern margin.

The Jukes facies wedges out completely 300 m west of the fault, and siliceous Owen Conglomerate rests directly on the rhyolite for a further 100 m. The second Jukes lens reaches a thickness of about 25 m at the nose of the next spur. Its base truncates columnar jointing in the rhyolite and, at the nose of the spur, truncates a 10 m wide quartz-feldspar porphyry dyke which is intrusive into the rhyolites. Blocks of rhyolite up to 2.5 m in length occur near the base of the lens, with many blocks up to 60 cm. The upper 5 m of the Jukes facies includes thin sandstone beds and there is a conformable contact with pink siliceous sandstone and fine conglomerate of the Owen Formation.

Immediately to the east of the Jukes Proprietary fault, the Owen Conglomerate is underlain by 3-4 m of volcaniclastic cobble-boulder conglomerate, containing numerous clasts of quartz-porphyry in a quartz-rich matrix, which is probably referable to the Jukes Conglomerate. It has an apparently gradational lower contact with pale quartz-phyric rock in which there are scattered small fragments of quartz-porphyry and a crude lithological foliation dipping steeply east. East of this it was not possible to distinguish Jukes Conglomerate from massive, fine-grained volcaniclastic material of the eastern sequence.

Bedded volcaniclastic rock, including coarse conglomerate, occurs beneath the Owen Formation on the south flank of East Jukes Peak, and is probably referable to the Jukes Conglomerate. An erosional but apparently conformable contact with overlying cross-bedded siliceous sandstone can be seen in several outcrops. Blocks of red siltstone up to one metre long occur in the volcaniclastic material in one outcrop, and mixed volcaniclastic and siliceous conglomerate also occurs in this sequence. An apparently gradational contact between siliceous pebble-cobble conglomerate and underlying, partly-volcaniclastic, sandstone, siltstone and conglomerate is exposed on the old walking track south-east of East Jukes Peak.

Lake Jukes area

Problems concerning the interpretation of the sequence at the northern end of Lake Jukes have been discussed in the previous section. On the south flank of Yellow Knob Spur, the siliceous Owen sequence is underlain by poorly-exposed, purplish, laminated fine sandstone and volcaniclastic sandstone, at least several metres thick. Its relationship to the underlying rocks could not be determined.

OWEN CONGLOMERATE CORRELATE

Proprietary Peak

The lower part of the Owen succession was examined on the north side of Proprietary Peak, where the beds dip gently SW. Above the western lens of 'Jukes Conglomerate' the sequence is as follows:

Unit	*Rock type*	*Thickness*
	Top not examined	
(7)	Pebble conglomerate, pink, thick-bedded. Erosional base.	30 m
(6)	Thin-bedded sandstone and shale.	6 m (approx.)
(5)	Cross-bedded pink coarse sandstone, erosional base.	3 m (approx.)
(4)	Thin-bedded sandstone and shale.	10 m
(3)	Massive pebble-cobble conglomerate (6 m) grading up into pink cross-bedded sandstone (10 m). Strongly erosional base.	16 m
(2)	Thin-bedded sandstone and shale	2 m
(1)	Mainly pink sandstone with some fine conglomerate.	12 m

Base: Volcaniclastic sandstone (Jukes Conglomerate).

The basal 70 m of the sequence in this area consists of alternating thin-bedded sandstone-shale units and thick-bedded (usually cross-bedded) conglomerate-sandstone units. Worm tubes and bioturbation structures occur in the thin-bedded zones, indicating that the sediments are marine. Other primary structures include current crescents and grooves, load casts, flute marks, pseudonodules, cross-lamination, ripple marks, lensing and possible flaser bedding, and flat lamination with parting lineation. Large-scale trough cross-bedding is characteristic of the thick-bedded units. The sequence has much in common with the Great Dome Sandstone of the Denison Range, which underlies the siliceous (and largely non-marine) Reeds Conglomerate and shows cyclic alternation of thin-bedded tidal and shallow marine deposits and thick-bedded channel deposits (Corbett, 1970).

West of the eastern lens of Jukes Conglomerate, the basal part of the Owen Formation rests directly on rhyolite and comprises some 36 m of cobble conglomerate, apparently underlying the sequence described above. The contact with the rhyolite is channelled and irregular, but there is a marked angular discordance between the sub-horizontal contact and the bedding in the overlying conglomerate. The bedding plunges into the contact at a steep angle, so that successively older beds are in contact with the rhyolite to the east. Since the contact is clearly not a fault, it presumably represents the steep wall of a large channel. Rotation of the conglomerate bedding to horizontal results in the contact having a dip to the east of 46°. The lens of Jukes Conglomerate which occurs to the east presumably occupies the floor of the channel.

Traveller Creek area

The conglomerate sequence is well exposed along the ridge on the eastern margin of the Traveller Creek basin from East Jukes Peak. Bedding in this area dips either steeply east or is slightly overturned to the west. There appears to be some angular discordance with the underlying volcaniclastic beds, but actual unconformity could not be proven due to lack of exposure. The base of the sequence in the Traveller Creek gorge comprises siliceous cobble-boulder conglomerate, with some large volcanic clasts,

interbedded with conglomeratic sandstone. Above the base is greenish-grey granule-pebble conglomerate and conglomeratic sandstone for about 20 m, passing up into thick-bedded pink pebble-cobble conglomerate. The conglomeratic lower part of the sequence has a maximum thickness of about 450 m and passes up into a sandstone sequence forming the eastern flank of the ridge. This unit shows abundant trough cross-bedding in the lower part, but passes up into flat-bedded, thin-bedded and ripple-marked greenish fine sandstone and minor siltstone after about 100 m. Abundant worm burrows and bioturbation structures occur in the upper part of the sequence.

Lake Jukes area

The base of the siliceous sequence in the cliffs north of Lake Jukes comprises 4-5 m of pink, coarse-grained, thick-bedded sandstone rich in volcanic quartz. Above this is about 4 m of purple-maroon cobble conglomerate, followed by at least 30 m of pink conglomeratic sandstone and granule-pebble conglomerate. Bedding dips west at about 50°.

Yellow Knob Spur

The siliceous sequence at Yellow Knob Spur forms a narrow SE-plunging syncline, the beds on the ridge crest dipping NE at 62°. The syncline is faulted off at its western end, and the fault and syncline axis reappear to the NW at Mt Jukes, where considerable south-side-up displacement on the base of the Owen is evident on the fault. The basal beds at the western end of the ridge are of pink pebble-cobble conglomerate, overlain by sandstone along the ridge crest.

At the eastern end of the spur, on the lower part of the track, the rocks are mainly thin-bedded pink sandstone and silty sandstone with minor pebble conglomerate. Worm tubes are present in some beds. Fine conglomerate with scattered pebbles of quartz-porphyry was also noted. Bedding in this area dips steeply W to SW and is probably overturned.

STRUCTURAL GEOLOGY

Central rhyolite sequence

The only primary structures indicative of bedding in the central sequence in the Jukes Proprietary area is the columnar jointing which is well exposed in at least two localities on the north face of Proprietary Peak. The columns have a moderately steep plunge to the NE, and if it is assumed that they are related to flows then the flow surfaces must dip SE at low to moderate angles. Cleavage was recorded at only two localities, being 167° ± vertical near the Jukes Proprietary contact, and 132° W65° to the NW of Proprietary Peak. Two foliations appear to be present in a thin section of rhyolite (75-242) from near the Jukes Proprietary contact.

Fine banding in the rhyolite of Adit Knob, just NW of the entrance to the lower adit, dips 137° W85°, and crude layering in a breccia below the second adit dips 142° W80°.

Eastern sequence

Overturned bedding dipping WSW at about 45° occurs in volcaniclastic rocks in the lower reaches of Traveller Creek. Apart from this the only primary foliation measured in this area was an alignment of pumice(?) fragments in a tuff or volcaniclastic rock near the Owen contact above Jukes Proprietary dipping east at 80°. Cleavage measured at several localities trends NNW and dips W at 60-70°.

In the Lake Jukes area, bedding and flow-banding trend generally NW to NNW and dip steeply west. One possible west-facing was obtained near Bean and Thow's prospect. A strong cleavage trending NW to NNW and dipping west at about 80° is present in most areas. This cleavage is roughly parallel to the NW-trending cross-fold of Yellow Knob Spur.

Owen Conglomerate

Two large minor folds, with sub-vertical axial planes trending 135°, and wave-length of the order of 5 to 10 m were observed in the lower part of the Owen sequence on the north face of Proprietary Peak. A good refacted cleavage is developed in siltstone beds within the Owen sequence in this area, and trends 115° S55°. Cleavage is otherwise not generally obvious within the siliceous conglomerate and sandstone beds of the Owen sequence.

The relationship of the Owen Formation to the eastern volcanic sequence could not be proven, but is probably unconformable, since the Formation laps across the sequence to rest directly on the central rhyolites. Dips in the Owen beds are generally significantly lower than those in the eastern sequence (*e.g.* Lake Jukes area), except in the lower Traveller Creek area, where more pronounced overturning in the underlying beds results in shallower dips.

REFERENCES

BANKS, M.R. 1962. Ordovician system, *in* SPRY, A.H.; BANKS, M.R. (ed). The geology of Tasmania. *J.geol.Soc.Aust.* 9(2):147-176.

CORBETT, K.D. 1970. *Sedimentology of an Upper Cambrian flysh-paralic sequence (Denison Group) on the Denison Range, South West Tasmania.* Ph.D. thesis, University of Tasmania, Hobart.

HILLS, C.L. 1914. The Jukes-Darwin mining field. *Bull.geol.Surv.Tasm.* 16.

[12 August 1976]

TASMANIA DEPARTMENT OF MINES

GEOLOGY OF PORTION OF MT JUKES AREA

K. D. CORBETT B. Sc. Ph. D.

5 cm

0 0.5 1 1.5 kilometres

0 0.5 1 mile

QUATERNARY

Moraine deposits.

CAMBRO–ORDOVICIAN

Sandstone. — OWEN CONGLOMERATE

Conglomerate. — OWEN CONGLOMERATE

Volcaniclastic conglomerate and sandstone — "JUKES CONGLOMERATE"

MT READ VOLCANICS

Undifferentiated volcaniclastic rocks and quartz-feldspar-phyric volcanic rocks. Areas of flow-banded or autobrecciated lava indicated. — EASTERN SEQUENCE

Chloritic agglomerate of Bean and Thows prospect.

Massive, fine-grained, pink to pale-coloured rhyolite, commonly spherulitic. Minor quartz-feldspar porphyry dykes. — CENTRAL RHYOLITE SEQUENCE

Geological boundary observed or accurate.

Geological boundary approximate.

Fault

Bedding, facing unknown, facing known, overturned.

Primary foliation in volcanic rock.

Cleavage, vertical cleavage.

Plunge of columnar jointing.

Prospect.

Track.

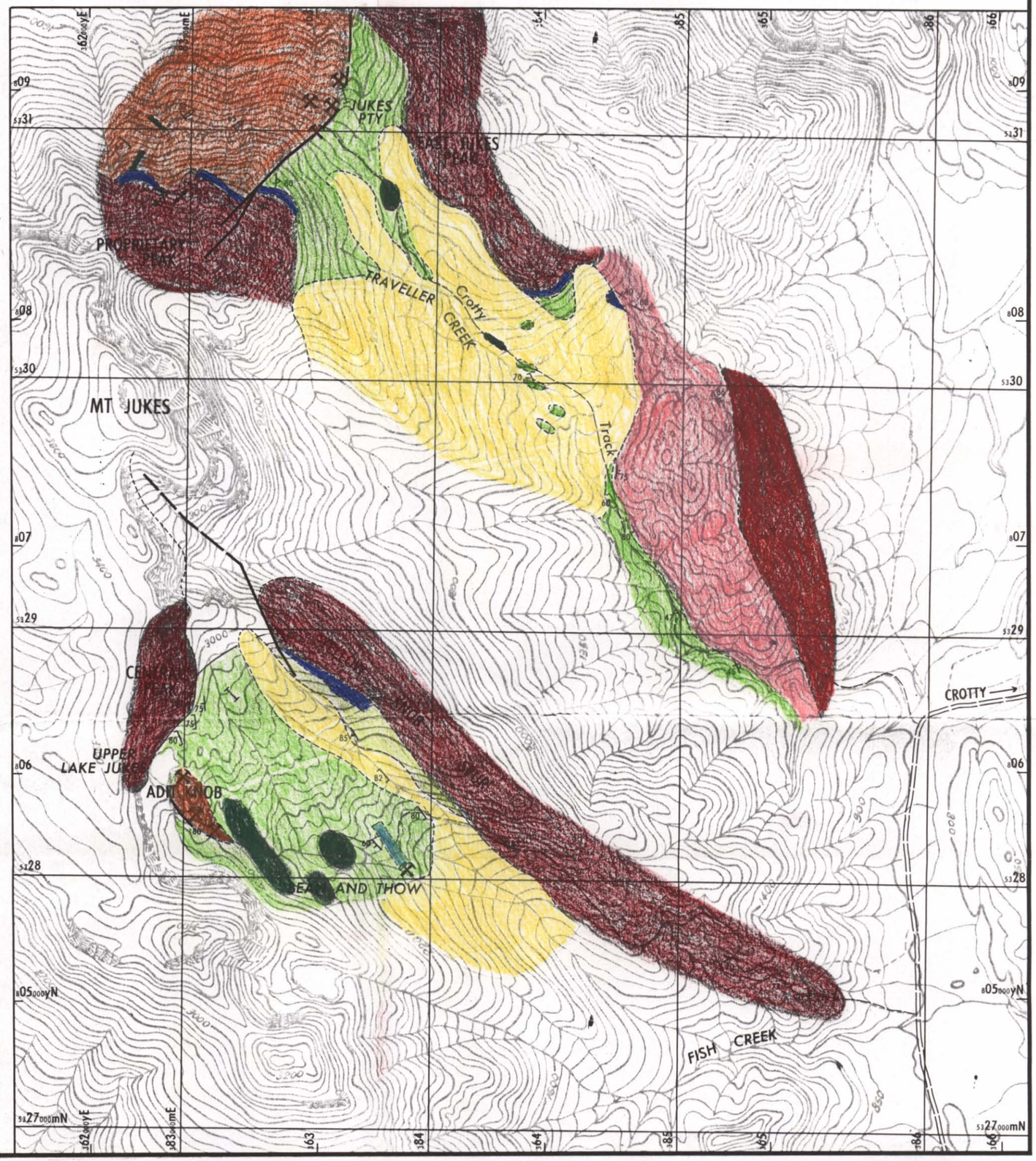

Figure 1

Unpublished Report 1976/49