

1982/35. Proterozoic sedimentary sequences in the eastern part of the Pedder Quadrangle, south-western Tasmania

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Abstract

Three thick, mainly shallow-water, successions are recognised in the Proterozoic rocks of the eastern part of the Pedder Quadrangle: (i) an orthoquartzite-dominated sequence, with some dolomite and mudstone; (ii) a mudstone and impure dolomite sequence with minor, thin orthoquartzite and conglomerate units; and (iii) a relatively pure dolomite sequence with several intervals of mixtite. Age relationships of (i) and (ii) are unknown, but (iii) unconformably overlies (ii) and is a possible equivalent of the Smithton Dolomite.

INTRODUCTION

This report is a summary of the Proterozoic lithostratigraphy of part of the Pedder Quadrangle lying mostly east of the Scotts Peak Road and south of Mt Bowes (fig. 1). This area was mapped by the writer over about eight months during the summer field seasons between 1978 and 1982.

STRATIGRAPHY

Sedimentary rocks of probable Proterozoic age occupy most of the area. In the highlands around Mt Anne they are unconformably overlain by a thin sequence of Permian subhorizontally-bedded conglomerate and fossiliferous marine mudstone (Lower Parmeener Super-Group). These rocks have been intruded by a thick sill (over 500 m) of Jurassic dolerite, transgressive in places, which constitutes those peaks and plateaux over about 1000 metres a.s.l.

The Proterozoic rocks, in the main, dip steeply and are younging to the north. They have undergone polyphase deformation but megascopic folding is mostly gentle. Regional metamorphism is of greenschist grade. The following three separate conformable successions were recognised.

(i) *An orthoquartzite-dominated sequence* occupies the southern part of the area, and is fault-bounded to the north against the next-described sequence. The base of the orthoquartzite-dominated sequence is not exposed, but the oldest formation mapped is argillaceous fine-grained grey-green dolomite with some small-scale cross-bedding. The next oldest is interbedded mudstone and impure dolomite, with three thin orthoquartzite units which crop out as strike ridges. This is overlain by interbedded mudstone and quartzose siltstone in which graded silt laminae are characteristic. Above these beds there are apparently two thick (800 - 1000 m) orthoquartzite units, but repetition by faulting of a single unit is a possibility. The orthoquartzite is white to pink, super-mature, dominantly of medium- to coarse-grain size, and shows well-developed planar cross-bedding throughout. Minor mudstone interbeds are present in places. This lithology is erosionally resistant, forming major strike ridges such as Deception Ridge and Celtic Hill. An isolated area of orthoquartzite, surrounded by Jurassic dolerite, crops out near the summit of Mt Eliza. This is either a raft, or a remnant of the roof of the sill, as its lower contact appears to be mainly horizontal.

(ii) *A mudstone and impure dolomite-dominated sequence* is faulted against the orthoquartzite-dominated succession and is unconformably overlain by

by the third (carbonate-mixtite) sequence to the north-east. This sequence begins with a thick (over 2000 m) unit of dolomite with minor interbedded limestone and mudstone, which occupies the area immediately east and north-east of Mt Anne. The remainder of the sequence is a probably conformable, thick (several thousand metres) succession of dominantly mudstone, with several significant intervals of dolomite. The carbonates contain variable amounts of terrigenous impurities, are usually well-bedded and in places show features that suggest a shallow-water environment of deposition (stromatolites, oolites, flat-pebble conglomerates). The mudstones are also lithologically very variable. A distinctive unit of red mudstone with graded silt laminae was mapped. Several thin (about 5 m) units of orthoquartzite crop out as strike ridges. Also included in this sequence is an eastward-thinning unit of sandstone and conglomerate, which crops out as a short strike ridge in the west of the mapped area, and appears to be laterally discontinuous.

An area of interbedded mudstone and siltstone with minor carbonate, to the east of the Weld River, is considered to be a correlate of this sequence.

The relationships of the interbedded quartzite and redbeds cropping out on Mt Bowes are uncertain.

(iii) A relatively pure dolomite and mixtite sequence, unconformably overlying sequence (ii). There is a relatively thin (up to 100 m) basal closed-framework conglomerate derived from sequence (ii) lithologies. This is overlain by about 800 m of massive, fine-grained dolomite, and then by at least 2000 m of dolomite largely composed of cross-bedded oolitic grainstone. Faulted against this part of the sequence is a further 2000 - 3000 m of dominantly massive, fine-grained dolomite with uncommon oolitic horizons, minor chert and mudstone, and several intercalations of mixtite. The mixtites contain angular and rounded clasts of up to boulder size, predominantly of dolomites lithologically identical to the enclosing sequence, but with minor extrabasinal constituents (mostly orthoquartzite). The mixtites are massive, have apparently abrupt top and bottom contacts and in some cases appear to be laterally impersistent.

Elsewhere in Tasmania, a thick Proterozoic dolomite sequence (the Smithton Dolomite and equivalents), in places associated with mixtites (Spry and Zimmerman, 1959; Griffin and Preiss, 1976), unconformably overlies older rocks (Williams, 1976). The dolomite and mixtite sequence of the Pedder Quadrangle is a possible equivalent of these rocks.

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[14 October 1982]



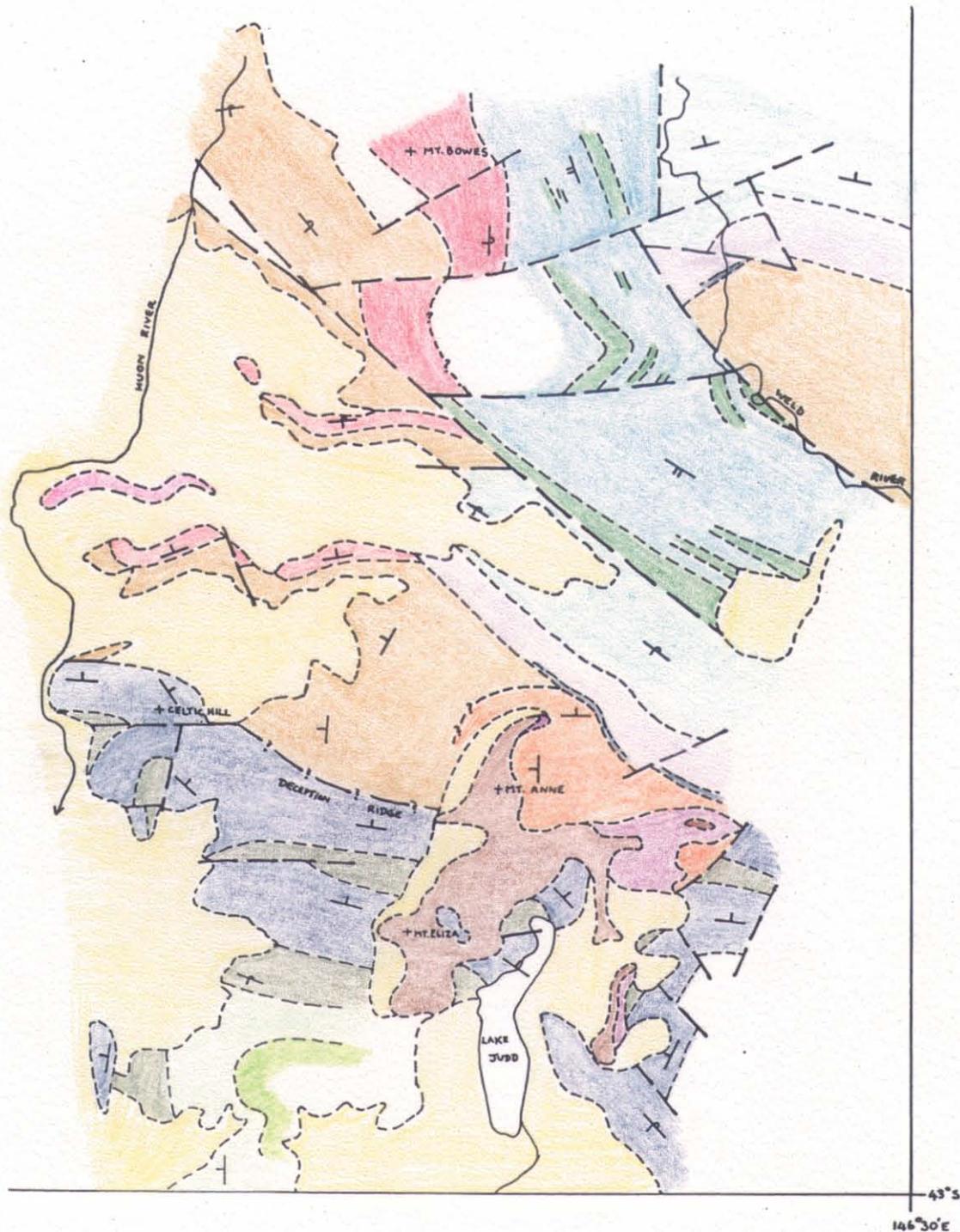
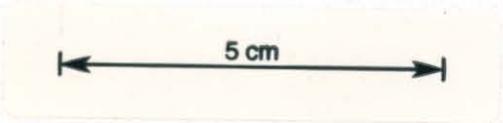


FIG. 1. 1:100 000 geological sketch map of the eastern part of the Pedder Quadrangle; based on 1:15 840 mapping. For legend see over.



LEGEND

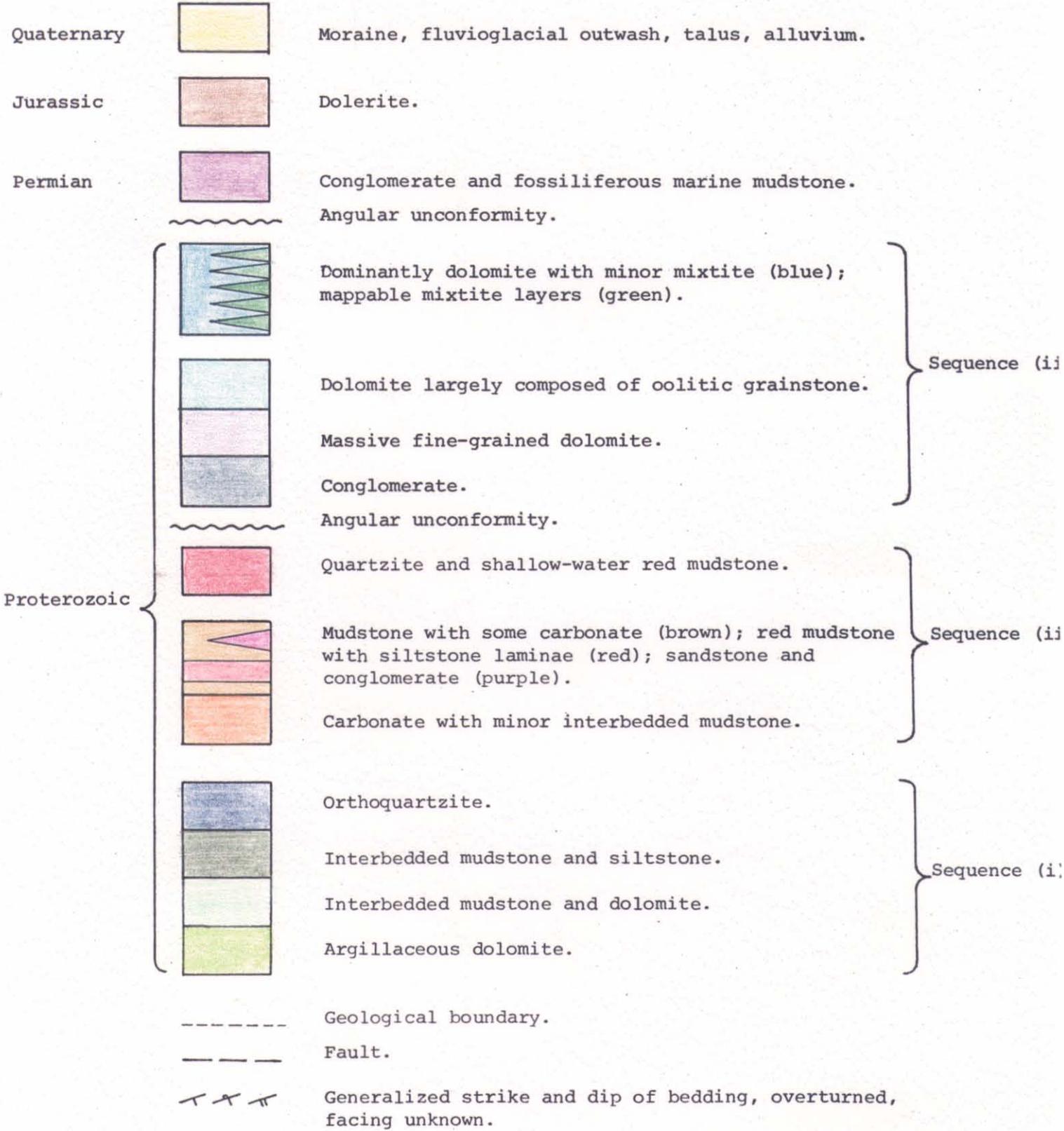


FIG. 1 (cont'd)