

sandstone dominated interval, both in the Interlaken and Oatlands Quadrangles, but as evidence accumulated it became apparent that their stratigraphic position, where determinable, was at the top of the sequence and their possible equivalence with the Muddy Fluvial Plain facies (Rm) of the Oatlands Quadrangle (Forsyth, 1984a) was indicated. At that stage no biostratigraphic data was available to support that possible correlation.

A second feature noted at this horizon was extensive outcrops of thin-bedded to medium-bedded, bioturbated, silicified sandstone with at least four distinct types of trace fossils and rare layers with abundant conchostracans. Because of poor outcrop, the silicified sandstone was mapped in isolation (R<sub>pc</sub>) but in better exposed areas it was later found to occur within the lutite-dominant interval. In a shallow bore intersecting rocks including pale to medium, blue-green siltstone and purple-grey mudstone, small fossils (about 1 mm) with black chitinous or carbonaceous shells were numerous in thin beds of the silicified sandstone with narrow, vertical trace fossils (RG45) [273498]. This particular fossiliferous sandstone lithology is widespread, occurring west to the Tiers scarp [221479], south to beyond the map boundary [220224], east of Tunbridge [394328], and at numerous localities west of Kitchener Ridge to the Tiers scarp.

It has not proved possible to recheck all lutite-rich sections for the presence or absence of distinct silicified sandstone layers, but field notes indicate silicified bioturbated sandstone beds are present south of Kitchener Ridge [343421], and non-silicified bioturbated sandstone occurs 1.5 km west of White Lagoon. Silicified, bioturbated sandstone is widespread in the Oatlands Quadrangle in the Muddy Fluvial Plain facies (Rm), and also occurs near Kaoota (Farmer, 1985), and at Mt Wylly near the south coast. Silicified sandstone and bioturbated sandstone occur separately in the lower Cluan Formation at Poatina. The evidence to date suggests that the silicified bioturbated sandstone layers are restricted to the upper part of the quartz sandstone sequence.

Lutite-rich intervals were found near the top of the quartz sandstone sequence south of Table Mountain but all silicified rocks found were interpreted, at the time of mapping, to be contact metamorphic rocks. Outcrop is particularly poor in this area but some siltstone, resembling rocks normally found in the upper part of the quartz sandstone sequence (R<sub>p</sub>), have been indicated as R<sub>pc</sub>? [112227], whereas yellow mudstone exposed further north-west has been indicated as R<sub>u</sub> [105230]. Subsequent to map compilation, additional outcrops were found underlying the last locality, and are of a range of lutite lithologies typical of the upper lutite-rich interval of the sequence R<sub>p</sub>. At the western end of Mike Howes Marsh, beds including carbonaceous siltstone, quartz sandstone and arkosic pink sandstone should be indicated as R<sub>pc</sub>, but are depicted as R<sub>p</sub>? [187234]. Limited support for these beds occurring at the top of the sequence R<sub>p</sub> has been obtained by palynological confirmation that nearby beds are part of the overlying sequence (R<sub>ls</sub>) [185236].

The sedimentary structures found in the quartz sandstone sequence (R<sub>p</sub>) are closely comparable to those found in the Oatlands Quadrangle (Forsyth, 1984a) but the nature of the outcrop yields a greater number of plan views of festoon fields, especially on platforms near the Blackman River north of Tunbridge. Occasional steep-sided tabular cross-bedded bars overlain by festoon cross-bedding have been noted [331465, 386349]. The bar cross-beds range from inclined laminae to what appears to be inclined thin beds, but what may actually be groups of poorly defined cross-laminae. Bar amplitudes rarely exceed one metre, and the dip of the inclined bar layers trends obliquely to the palaeocurrent directions of the overlying festoons. The structures may be

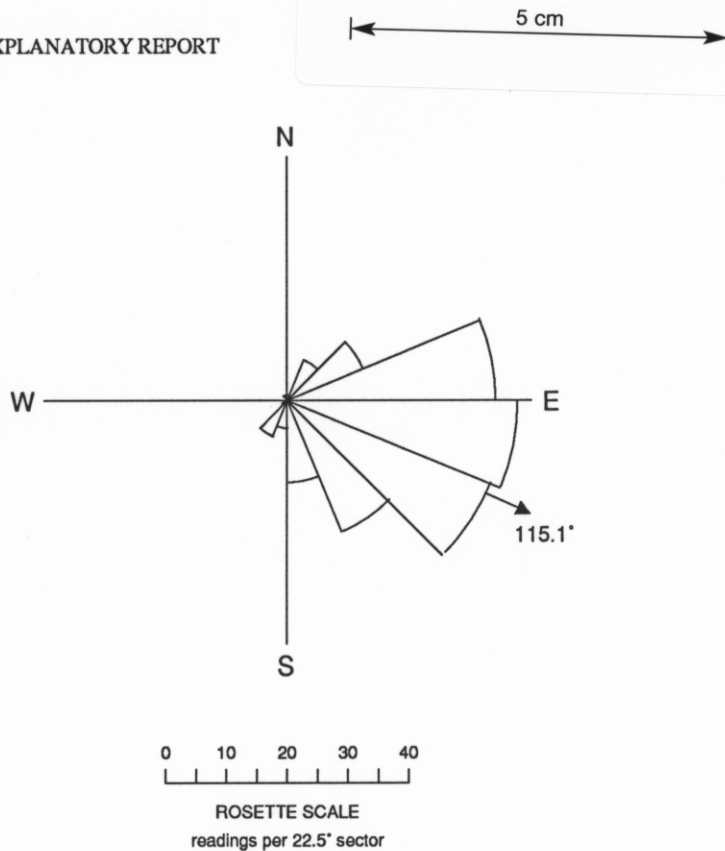


Figure 10. Palaeocurrent vectors in the quartz sandstone sequence (R<sub>p</sub>). Mean vector calculated from cross-bedding and festoon axis measurements of relative unit magnitude.

$$N=196, \theta=115.1^\circ, VMA=150.2, VMA/N=0.77$$

braided bars. The sandstone of the sequence R<sub>p</sub>, as in the Oatlands Quadrangle, is considered to be formed from the deposits of low sinuosity rivers. Average palaeocurrent direction lies between east-south-east and south-east (fig. 10).

Palaeocurrents depositing sandstone beds in the upper lutite-rich interval appear to show a greater degree of azimuth variations. This may be related to inclusion of data from an overlying sequence at one locality, where currents are directed westward [320493]. Westward palaeocurrents were also measured elsewhere, and could indicate overbank current directions without necessarily implying a significant change in palaeoslope.

The main quartz sandstone-dominated interval of the sequence R<sub>p</sub> is an extension of the quartz sandstone sequence (R<sub>p</sub>) of the Oatlands Quadrangle (Forsyth, 1984a), and is a litho-correlate of the Ross Sandstone at Poatina (McKellar, 1957). The litho-correlates outside of the Interlaken Quadrangle contain a microflora indicating correlation with Griesbachian to mid-Smithian rocks of Western Australia (Playford, 1965; Forsyth, 1984a). A broadly similar microflora was obtained from a shallow bore near Ross which intersected the quartz sandstone sequence. This microflora lacks *Aratrisporites*, contains species found in the Western Australian floras, and appears to be younger than the *Protohaploxylinus microcorpus* zone (RG28) [391473]. The microflora is dominated by cavate spores, especially *Lundbladisporea brevicula* Balme, 1963, with *Densoisporites playfordii* (Balme) Dettmann, 1963; *Densoisporites nejburgii* (Schulz) Balme, 1970; circular and subtriangular cingulate spores including *Limatulasporites fossulatus* (Balme) Helby and Foster in Foster, 1979; and *Playfordiaspora crenulata* (Wilson) Foster, 1979. Bisaccate forms are not common but include *Falcisporites australis*, *Protohaploxylinus* spp. and *Lunatisporites*. Microfloras of this type extend virtually to the base of the quartz sandstone