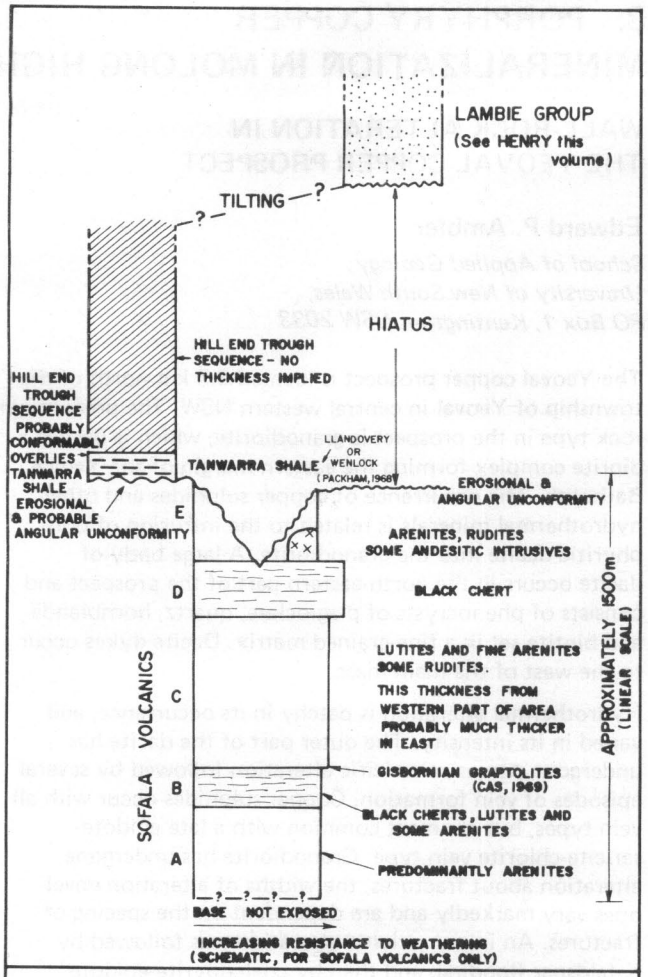

FIGURE 2 STRATIGRAPHIC COLUMN

Definition of the major structures of the Sofala Volcanics (Fig. 1) has shown a repetition of sequence which implies a thickness of about 1500 m for the exposed Sofala Volcanics (Fig. 2). The redefined Sofala Volcanic sequence shows that the Hill End Trough sequence and the rocks of the Lambie Group overlie the Sofala Volcanics at approximately the same stratigraphic level.

THE STRATIGRAPHY AND STRUCTURE OF THE UPPER DEVONIAN ROCKS BETWEEN MT. HORRIBLE AND THE RAZORBACK ROAD, AND THE IMPLICATIONS FOR THE TECTONICS OF NSW

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Recent mapping of Upper Devonian – ?Early Carboniferous rocks north of Mt. Horrible reveals a coarsening-upwards sequence showing a complete regression from neritic to fluviatile and piedmont fan environments. The basal marine and littoral sediments consist of indurated quartz-rich (60-80%) arenites with some *Cyrtospirifer* horizons. The lower fluviatile sequence consists of quartz-rich arenites and red oligomictic conglomerates with rounded quartzite clasts. The upper fluviatile arenites and rudites have variable composition and poor sorting. The uppermost sediments are characterised by an increased proportion of lithic detritus (Fig. 3).

Preliminary palaeocurrent measurements indicate a southerly source for much of the quartz-rich marine and lower fluviatile sediment. This trend overrides a prominent bimodal NW-SE trend (possibly related to alternating longshore currents parallel to the palaeostrandline) in the lower marine sequence. With the exception of the upper texturally immature sediments, the succession is similar to other Lambian Provinces. Palaeogeographic reconstructions of the eastern part of the Lachlan Fold Belt in the Frasnian suggest a NW-SE strandline which receded northeastwards contemporaneously with uplift in the south. The detritus was probably carried by large braided stream systems which deposited the material in a near-shore marine environment where longshore currents, waves and tidal currents could redistribute it.

The upper part of the sequence is less characteristic of Lambian sedimentation, and some palaeocurrent data suggest a northwestern provenance. This change in palaeotopography may be related to uplift associated with the emplacement of the Yeoval Granite (Henry, 1975).

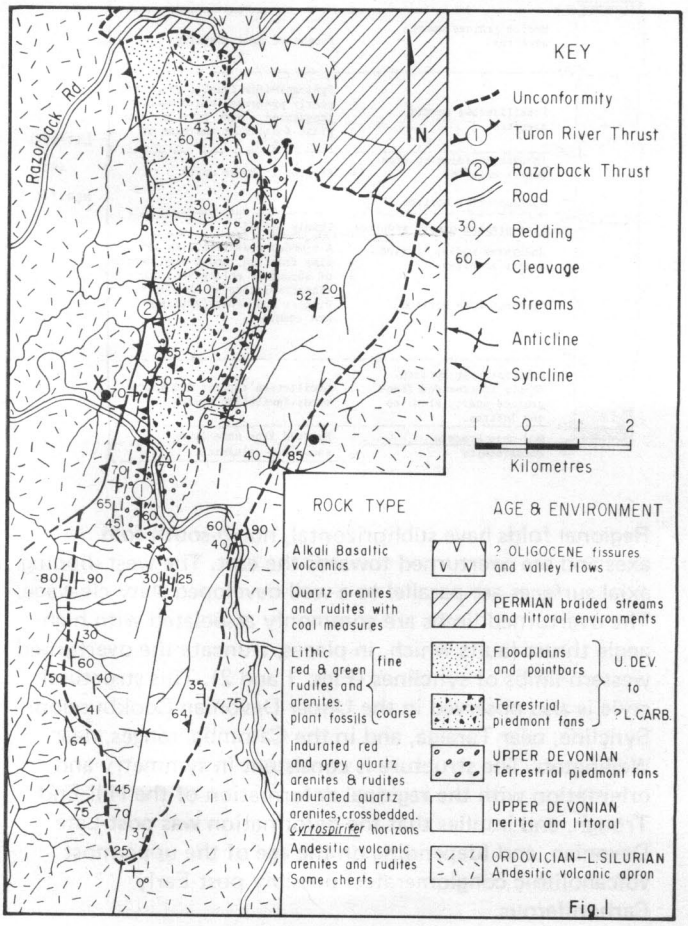
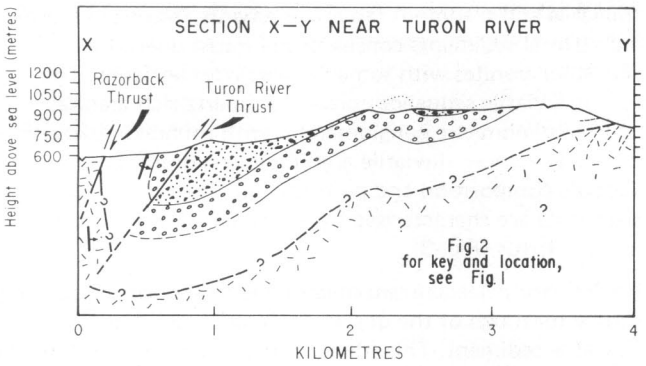
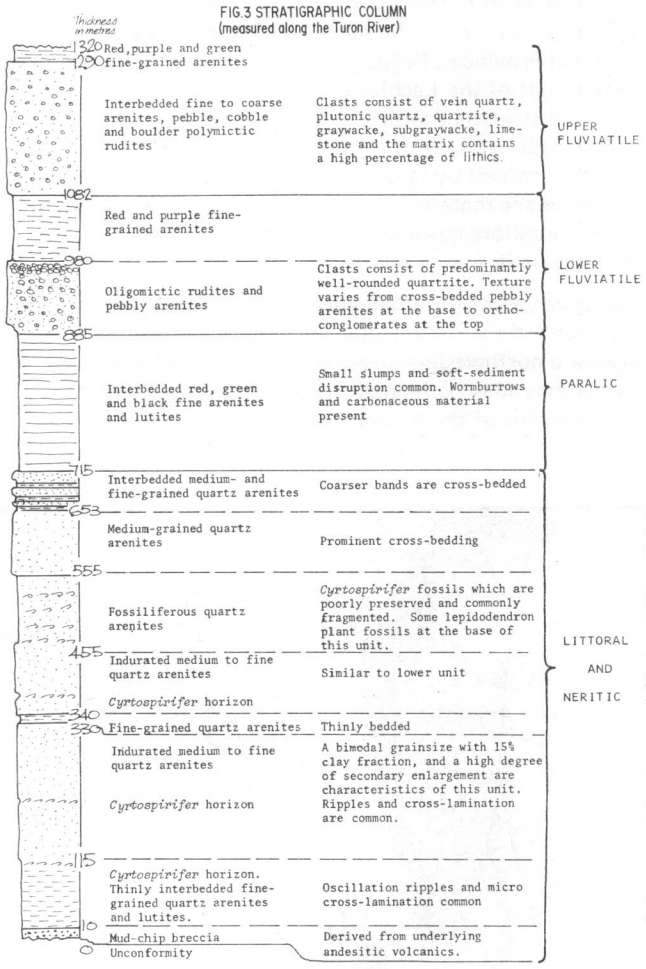


Fig. 1





Regional folds have subhorizontal, north-south fold axes and are overturned towards the east. The west-dipping axial surfaces are parallel to a well-developed slaty cleavage. The overturned limbs are commonly associated with high-angle thrust faults which, in places, truncate the overturned western limbs of synclines (Figs. 1 and 2). This structural style is also observed in the Upper Devonian Cookbundoon Syncline, near Taralga, and in the Catombal ranges, near Wellington. The structure is consistent in symmetry and orientation with the regional deformation of the Hill End Trough, and implies that the deformation was post-Late Devonian, and (depending on the age of the uppermost volcanolithic conglomerates) possibly post-Early Carboniferous.

3. PORPHYRY COPPER MINERALIZATION IN MOLONG HIGH

WALL-ROCK ALTERATION IN THE YEOVAL COPPER PROSPECT

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The Yeoval copper prospect is located 3.5 km north of the township of Yeoval in central western NSW. The predominant rock type in the prospect is granodiorite, which is part of a diorite complex forming the eastern margin of the Yeoval Batholith. The occurrence of copper sulphides and other hydrothermal minerals is related to the intrusion of porphyritic dacite into the granodiorite. A large body of dacite occurs in the north-eastern part of the prospect and consists of phenocrysts of plagioclase, quartz, hornblende and biotite set in a fine-grained matrix. Dacite dykes occur to the west of the main mass.

Hydrothermal alteration is patchy in its occurrence, and varied in its intensity. The outer part of the dacite has undergone pervasive sericitic alteration followed by several episodes of vein formation. Copper sulphides occur with all vein types, but are most common with a late epidote-sericite-chlorite vein type. Granodiorite has undergone alteration about fractures; the widths of alteration envelopes vary markedly and are dependent on the spacing of fractures. An initial sericitic alteration was followed by K-feldspar flooding, and then by chalcopyrite-epidote-sericite vein formation. In both dacite and granodiorite, barren calcite and calcite-sericite veins are the last to form.

Sulphide mineralogy is simple: chalcopyrite is the most common sulphide present with minor amounts of bornite, molybdenite, digenite and galena. Pyrite is very rare and has been observed only in zones of intense potassic alteration. Sulphides occur as vein minerals and as disseminated grains at sites of mafic mineral alteration.

The occurrence of prehnite and clays as common constituents of alteration mineral assemblages suggests an upper temperature limit of approximately 350°C for the formation of the deposit.

THE GEOCHEMISTRY OF THE COPPER HILL DEPOSIT

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The Copper Hill Igneous Complex (near Molong) has three major phases – a quartz diorite and two dacites with