5 cm

the likelihood of complex fault arrays in this tectonic environment, it is reasonable to propose distribution of fault orientations along two great circle girdles (A and B, stereonet C). This raises the possibility that the faults have been folded by the north and northwest-trending folding discussed above.

Stereonet D (fig. 3) presents the orientations of minor faults bearing quartz-fibre striations and one fault with spatially-related tension gashes; these structures occur on the upper and lower margins of the fault rock. Minor faults, carrying striations on which the sense of slip is known, have long been recognised as useful in identifying the regional stress tensor (Bott, 1959; Angelier and Mechler, 1977; Findlay, 1980; Etchecopar *et al.*, 1981; Angelier, 1984). Although the slip sense on the observed striations could not be determined, and the data in stereonet D are too few for adequate statistical analysis, these faults do suggest a dip-slip regime, given their present orientation. The fault-tension gash system is indicative of a NW–SE directed stress system. Combining the two sets of data leads to the interpretation that these faults formed in a reverse fault system with a NW–SE directed stress tensor. It is emphasised strongly that this interpretation rests on simplistic assumptions concerning the mechanics of faulting and that it does not take into account the previously described multiple folding.

NIKE MINE AREA

Blissett and Gulline (1962) mapped a sliver of Cambrian rocks striking west from Vanoaness Hill (fig. 1) to the Trial Harbour Road. The southern contact between these rocks and the Oonah Formation to the south is exposed in a track cutting at grid reference CP598604, due south of the Nike Mine (fig. 1). Here the fault contact dips steeply south, and the fault rock is relatively thin. At the contact, quartz-fibre striations on three minor faults indicate reverse dip slip (fig. 4), as does the geometry of the C-S fabric within the fault rock.

This fault was mapped initially as an inferred splay off the Balstrup Fault (Blissett and Gulline, 1962). However, given our conclusions that the 10th Legion Thrust controls the outcrop of the south-trending "tongue" of Oonah Formation in the Zeehan area (fig. 1), it is reasonable to regard the exposure at CP598604 as displaying part of the thrust, here tilted to a steep southerly dip. Note that simple rotation of the C-plane in Figure 4 to shallow or zero dips would produce a shallowly-dipping C-S fabric with the same movement sense (dextral) as that seen at the South Comstock Mine.

Age of 10th Legion Thrust

The 10th Legion Thrust cuts across units ranging in age from Cambrian to Lower Devonian, and appears to be folded on both a small and regional (fig. 1) scale by the same north and northwest-trending folds which occur in these units (Blissett and Gulline, 1962) and which are attributed by Williams (1978) to the late Early to middle Middle Devonian Tabberabberan Orogeny. The Oonah Formation is intruded by the Heemskirk Granite, which is likely to extend under and east of the thrust sheet to meet with the Housetop Granite some 60 km east (Richardson and Leaman, 1987). These two granitic bodies therefore

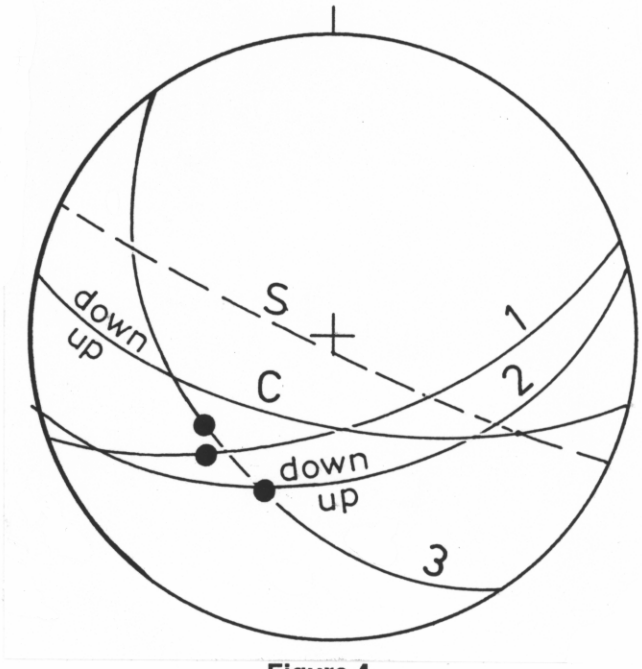

Figure 4.

Equal area lower-hemisphere stereographic plot of S and C-planes and fault (1, 2, 3) with quartz-fibre striations (solid circles) on faults at grid reference CP598604.

"pin" the thrust and as their ages range between 330 and 380 Ma, with the overlap in respective ages spanning the range 345–360 Ma (McClenaghan *et al.*, 1989), thrusting occured before Late Devonian/ Carboniferous times.

In the Zeehan district the extensive Sn-Pb-Ag-Zn mineralisation is associated with the Heemskirk Granite (Blissett, 1962). Many of the orebodies strike between NNW and NNE and follow zones of faulting, shearing and fracture resulting from the Tabberabberan deformation (Blissett, 1962); however Blissett also states that the orebodies have been dislocated by post-Permian faults and thrusts. As the relationship between the faults described by Blissett (1962) and the 10th Legion Thrust has not been determined, the relationship between the north and northwest-trending folding and the 10th Legion Thrust is critical; our present view is that as the thrust precedes these folds it represents an early phase of Tabberabberan deformation.

REGIONAL IMPLICATIONS

The recognition that the southern outcrop trace of the Oonah Formation is controlled by thrusting of probably Early to Middle Devonian age has major implications for the interpretation of the Precambrian to Upper Palaeozoic geology of western Tasmania. These implications include the following:

1. If the Oonah Formation is a thin thrust sheet, does it override Cambrian and Ordovician beds of economic importance? Note that:

   (1) acid volcanic rocks of probable Cambrian age and carbonate-bearing Ordovician units are known in the Dunkley Tram valley;