Reply by S. S. Webster

I am pleased that Yeates *et al* have replied to my brief comment (Webster 1984b) on their articles as it is convenient to use this journal as a forum for open discussion on geophysical matters, especially those requiring adaptation to our environment.

My comments were primarily directed towards an alternative interpretation of their data which they "purposely avoided". My discussion, concerning the two currently accepted granitoid classifications and related mineralization, was brief as a more exhaustive discussion appeared in the same issue (Webster 1984a) and a subsequent issue (Webster 1984c). As these were referenced, I did not feel it necessary to repeat myself, yet their reply selects this point as an error in the discussion and imply I cite "unsubstantiated sentences". However, I stand by the above referenced articles to fully argue my case.

The short note was written due to my concern that their main recommendation of a panacea parameter (4 or 5 p.p.m. eU) to indicate a prospective "tin granite" was not the only conclusion from their data.

As my comments have been misinterpreted I shall explain below:

(1) In my tin exploration experience I know of no significant occurrence where the source of the tin mineralization outcrops. In most cases there are multiple intrusions with different chemical and physical parameters, thus 3–6 samples of a granitoid, as used by Yeates *et al*, cannot be used to classify the intrusion(s) as prospective. Recent work by Criss and Champion (1984), though dealing with magnetic properties, shows the inhomogeneity of granitoids and batholiths.

To conclude that the outcrop available for spectrometric sampling is diagnostic of the granitoid(s) is optimistic but often necessary. To further conclude that a panacea cut-off estimate can be used to indicate prospectivity is perhaps a little more ambitious, especially if one does not consider alternative interpretations, as proposed in my short note.

(2) I am concerned that many of their type examples of mineral prospects are merely small localized occurrences, or occur within complex intrusions, which cannot be used to refute a more general classification. For instance, the examples in their reply are not clear situations:

(a) the Black Andrew Mountain wolframite occurrence, within the Burrinjuck Adamellite, is hosted by a narrow quartz vein "developed in a high temperature hydrothermal environment" where "acid intrusions . . . intrude earlier granodioritic intrusions" (Bowman 1974), with Bi and Mo also present.

(b) the mineralization cited for the Gumble Granite occurs within the contact metamorphic aureole over a shallowly dipping contact intruded by another smaller granite stock. The mineralization is complex with host rocks being granite, skarn, marble and related volcanics (Stevens 1975). The Gumble Granite has several other minor mineral occurrences of which Cu–Au and Mo are the common minerals.

In their reply is a reference to "one of the great geophysical boundaries" of Wyatt *et al* (1980) and the fact that the division of zones 1 and 2 was only cited out of convenience. This geophysical feature reflects the Gilmore Suture (Scheibner 1982) along which the Ordovician Wagga–Omeo metamorphics are in contact with the Ordovician volcanic arc complexes in the east. Relative tectonics, structure and mineralization contrast across this boundary and explain the noted geophysical and geological characteristics. Such a feature must be considered in interpreting the data sets, not merely used "for convenience".

A combination of geophysical techniques (Webster 1984d), can be used in granitoid related mineral exploration to define target areas for follow-up. Such an integrated approach is preferable to using one technique in isolation. The identification of regional signatures for:

(1) tin deposits in south-east Australia;
(2) porphyry copper systems near Parkes;
(3) hydrothermal gold at Stuart Town and elsewhere in the Lachlan Fold Belt;

may lead to the discovery of additional deposits without surface expression.

The future of exploration requires an open-minded approach with consideration of as many concepts and search techniques as economically possible.

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