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Myrmekites From the Haast Schists, New Zealand: A Discussion

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Abstract

The hypothesis suggested by Shelley (1973) for the origin of a quartz–plagioclase symplectite in the Haast Schists, which are poor in K-feldspar, contrasts markedly with that initially proposed by Shelley (1964) for the genesis of myrmekite. If it is accepted that the intergrowth comes within the term myrmekite, then Shelley (1973) has presented further evidence that myrmekite is polygenetic.

In his paper on the Haast Schists, Shelley (1973) has described rocks containing "myrmekite" in which he can find no evidence for the former presence of widespread K-feldspar (see also Cooper, 1972, p. 483), nor does any clear association occur between the "myrmekite" and muscovite. Further, he suggests that the so-called negative evidence presented in Phillips *et al* (1972) casts some doubt on the representativeness of the quartz-plagioclase proportionality relationship reported by Phillips and Ransom (1968). However, good demonstrations of the validity of the proportionality relationship are given by Barker (1970) and Ashworth (1972) who lend support to the results obtained by Ransom and myself. In addition, Ashworth (1972, p. 46) says that Shelley's (1964) original hypothesis ". . . fails to account for the quartz proportionality relations which are more consistently observed in myrmekites than is any structural association." It seems evident that some myrmekite does display a proportionality relationship between the amount of quartz present and the An content of the associated plagioclase.

Shelley (1973) also believes that ". . . resorting too frequently to the answer that myrmekite is . . . polygenetic . . . may often mean nothing but special pleading. . . ." I cannot agree with this statement, and evidence presented elsewhere (*e.g.* Phillips, 1964; Phillips and Ransom, 1970; Ashworth, 1972; Phillips *et al*, 1972) strongly suggests that myrmekite is polygenetic and that this is not a matter of special pleading.

In his first paper on myrmekite, Shelley (1964) proposed that the intergrowth developed its distinctive habit by the constriction of pre-existing strained quartz which was enveloped by albite exsolved from contiguous K-feldspar. In his recent paper Shelley (1973) states that the Haast Schist "myrmekite" is a special type of poikiloblastic texture which is completely dissociated from any adjacent K-feldspar. He admits that his original hypothesis creates some problems with regard to the proposed presence of intergranular marginal quartz at myrmekite sites and notes in this regard that for some granitic myrmekites ". . . no solution immediately presents itself." One answer may be that "granitic" myrmekite forms by exsolution (Phillips, 1964). I cannot agree that both his propositions (1964 and 1973) are essentially the same and submit that because of Shelley's differing views, he must, despite his comments, be regarded as an advocate for the polygenetic origin of myrmekite. Further, it is difficult for me to accept that all myrmekite can be simply regarded as a special type of poikiloblastic texture, however versatile a notion this may appear to be to Shelley.

I wonder if in fact the Haast plagioclase-quartz intergrowths really fit the usually accepted definition of myrmekite. This textural term is generally applied to synantectic intergrowths between vermicular quartz and plagioclase where these minerals occur *in contact* with K-feldspar, or where it can be shown that the quartz and plagioclase (commonly with muscovite) have pseudomorphed K-feldspar (Ashworth, 1972; Phillips *et al*, 1972). Such a practice is quite clearly indicated in Sederholm (1899, 1916, especially p. 62); Williams, Turner, and Gilbert (1954, p. 20); Hatch, Wells, and Wells (1961, p. 173); the *Dictionary of Geological Terms* prepared by the American Geological Institute (1962, p. 338); Deer, Howie, and Zussman (1963, p. 75);

Read and Watson (1968, p. 561); and Joplin (1971, p. 25), to list only a few references. Shelley (1973) is undoubtedly dealing with some kind of poikiloblastic symplectite but I would hesitate to refer to it as myrmekite.

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