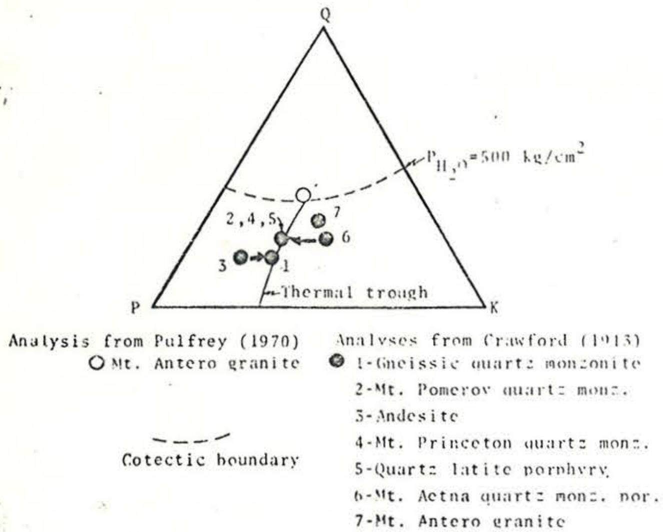

Fig. 2 Normative Quartz-Plagioclase-Potassium Feldspar System.

appears to be contaminated with SiO_2, because the liquidus phase suggested from thin section data is microperthite. Petrographic data of other Mr. Antero granite samples indicate that simultaneous crystallization of quartz, orthoclase, and albite occurred after initial alkali feldspar development. Final crystallization of the magma proceeded at the cotectic minimum (Fig. 2). Unmixing of the alkali feldspar occurred below 660°C (Tuttle and Bowen, 1958), resulting in development of the microperthite. Extrapolation of the data of Jahns and Burnham (1969) with an average muscovite plus biotite content of 5.5 percent in the Mt. Antero granite (assuming an original content of 1.0 percent water in the magma after Holland, 1972) indicates that when the Mt. Antero magma was 90 percent crystallized, the water content of the rest-liquid would be about 7 percent. This indicates that the rest-liquid was unsaturated (Jahns and Burnham, 1969, Fig. 2, p. 850) with respect to water.

The small genetically-related pegmatites occur in the upper part (Hood zone) of the Mt. Antero granite and indicate that some segregations of supercritical aqueous fluid occurred. The separation of aqueous fluid was facilitated by the low confining pressure of the crystallizing system, and by fractures in the outer part of the crystallized granite mass. Similar but smaller segregations are indicated by miaroles and accessory beryl. Resurgent boiling of the aqueous fluid promoted some resorption of the Mt. Antero granite, but, more importantly, promoted large crystal growth and concentrated molybdenum in the pegmatites. Molybdenite is present in a pegmatite vein which intrudes the Mt. Pomeroy quartz monzonite west of the Antero granite. The vein is believed to be related to the pegmatites of the Antero granite because of similar mineralogy, particularly of beryl (var.-aquamarine). Molybdenite has not been identified in any of the other Antero pegmatites.

Separation of the aqueous fluid from part of the melt apparently occurred rapidly as indicated by the fine-grained mass of the Mt. Antero granite and the aplitic dikes. Pressure loss with the separation left the rest-liquid in a subsolidus position; rapid crystallization with resulting fine-grained aplitic textures occurred.

The temperatures of crystallization of the final phases of the Mt. Antero granite were relatively low. Muscovite and biotite were parts of the final interstitial crystallization products and are indicative of a subsolvus granite (Tuttle and Bowen, 1958).

CONCLUSIONS

Fractionation of the Mt. Princeton quartz monzonite magma appears to have been responsible for generation of petrogeny's residua, represented by the Antero granite (Fig. 2). It appears that the magma was deficient in metals as well as water and sulfur. As a result, the trace metals were incorporated in silicates until the final residual fluid concentrated molybdenum, sulfur, and other volatiles in sufficient concentration to form the mineralized pegmatites.

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