

crystals are smaller than the pyroxene, lath-shaped, and near andesitic in composition. Orthoclase is abundant. It has a mottled appearance and contains a great number of inclusions of the other minerals. Alteration has been very slight. A few fibres of sericite have developed in the feldspars and a little kaolin and the pyroxene phenocrysts are bordered by a narrow fringe of secondary hornblende. Some introduced sulphides are present.

Centre Star Dyke.

The deeper parts of the *Centre Star* dyke consist of a rock very similar in appearance to porphyritic monzonite, but less distinctly porphyritic. Mineralogically it is in parts somewhat similar, but in depth it becomes more basic. A slide taken from a specimen on the eighth level of the *Centre Star* consists of plagioclase, biotite, pyroxene, magnetite, and apatite, with a little olivine. Plagioclase and pyroxene make up the bulk of the rock, but biotite is prominent. The plagioclase, andesitic labradorite in composition, is considerably altered to sericite. The pyroxene is in light green, well-formed crystals twinned and zonally grown. Some chlorite has developed. Most of the small amount of olivine is altered to serpentine. A specimen from presumably the same dyke on the fourteenth level differs in having in it a considerable amount of deep-brown hornblende. Some calcite and green hornblende have developed as secondary products. In both samples there is a tendency toward ophitic structure.

Angite-Camptolit.

From rocks like those just described are gradations towards angite-camptolite. One of these has been called for reference the *Spokane* type because typically developed in the tunnel of the *City of Spokane* mine. It is strikingly porphyritic, with phenocrysts of brown hornblende and feldspar an inch across. The ground-mass is fine-grained. Microscopically it is seen that the hornblende forms the larger phenocrysts, but plagioclase is more abundant. Pyroxene is also in some quantity and the ordinary alteration products are present. The plagioclase is in stout tabular crystals considerably altered and surrounded by reaction rims. Lath-shaped plagioclase of the variety andesitic, pyroxene, and both green and brown hornblende form the ground-mass. A dyke 90 feet east of the *Centre Star* dyke, on the thirteenth level of the *War Eagle*, is somewhat similar. In this case the plagioclase is labradorite and some biotite is present. Alteration has produced considerable epidote, most of which is in radiating aggregates.

A dyke west of the *Centre Star* dyke, on the fifth level of the *War Eagle*, has a few large phenocrysts of white, zonally grown pyroxene and badly altered andesitic in a fine ground-mass composed of rods of brown hornblende and feldspar. Considerable magnetite is present. A dyke 50 feet west of the *Tramway* dyke, *Josie* 100-foot level, differs only in having more plagioclase as well as some orthoclase and an extremely fine ground-mass. Other similar dykes are found 250 feet from the west end of the crosscut to the *War Eagle* on the ninth level of the *Centre*, and 175 feet west of the *Centre Star* dyke in the south workings of the fourth level of the *War Eagle*.

Vesagite.

By decrease of plagioclase and increase of orthoclase, camptolites pass into vesagites. A rock that may be classed as the latter is found in a dyke in the *Iron Mask* tunnel, *War Eagle* fourth level, 340 feet from the portal. It is very fine-grained with rods of brownish hornblende and unstratified feldspar. Magnetite is abundant and alteration has produced calcite and epidote.

Kersantite.

Kersantites are dyke rocks characterized by the presence of biotite and plagioclase. A rock fitting this description occurs as a small dyke cutting the *Nickel Plate* dyke on the fifth level of the *Centre Star*. It has a strike parallel to the big dyke. It is composed of lath-shaped feldspar crystals that approach labradorite in composition and fibres of biotite. The two form a felt of thin needles. A little serpentine and calcite are present. A mica dyke from the tunnel of the *Jumbo* mine near the pulaskite-contact consists of biotite, pyroxene, plagioclase, orthoclase, and apatite in order of their abundance. The plagioclase is andesitic and the pyroxene a light-green variety. The interstices are filled by orthoclase. A fine-grained specimen of the *Josie* dyke on the third level of the *War Eagle* has a similar composition.