PETROGRAPHIC REPORT
ROGUE FORMATION SECTIONS,
SOUTHWEST OREGON

Five hand specimens were submitted by Ronald C. Parker which had been collected from a locality underlain by rocks of the Rogue Formation in southwest Oregon. The specimens were in the size range of about 2 x 3 inches. Each specimen was cut so that a slice approximately $\frac{1}{4}$ inch thick was available for sectioning. A standard petrographic slide was subsequently prepared from each specimen and examined microscopically.

Rock A

In hand specimen the rock is light greenish-gray, fine-grained, compact and hard, with no discernible planar structure. A few small areas or "spots" 1-2 mm in diameter are light colored and at first glance resemble phenocrysts. On examining a sawed surface of the specimen under a binocular microscope it appears that the spots are actually ovoid shaped areas lacking in darker mineral content. In a few of the ovoid spots cavities were observed with interior coatings of red-brown iron oxide. When the slide itself was examined in reflected light, red-brown oxide was noted along some intergrain boundaries as thin ribbon or thread-like coatings. Except for the iron oxide, which quantitatively amounts to only traces on the slide, no other opaque minerals are present.

In transmitted light, under crossed nicols, the rock exhibits a xenoblastic granular, or very intimately intergrown, texture. This feature largely accounts for its rather hard character. The grain size is very fine, averaging from about 0.1 mm and less.

The observed essential minerals are epidote, quartz, and plagioclase.

Epidote and possibly some clinozoisite constitute 50% or more of the rock. Brownish isotropic patches or grains of allanite occur with the epidote. Plagioclase and quartz make up the remainder of the rock. Quartz is most prominent in a veinlet 1.5 mm wide and extending across the slide and also in a 10 mm band across one end of the section which is a portion of another quartz veinlet. In the veinlets quartz displays a mosaic texture, almost ribbon-like and has a faint undulatory extinction. A few scattered subhedral to euhedral grains of fresh appearing epidote occurs with the veinlet quartz. The quartz veinlets comprise about 7% of the slide. Plagioclase content is difficult to estimate because it is alkalic, has low relief and lacks twinning, but it is probably dominant over quartz in the remaining 40% or so of the slide. Alteration is confined to a very little chlorite occurring with the epidote. Curiously, not only does the rock lack opaque minerals, it also lacks noticeable accessory minerals.

Petrologically, the rock would fit nicely in the epidote-albite-amphibolite metamorphic facies. However, lack of any noticeable lineation, foliation, etc., seems to mitigate against regional metamorphism. Conversely, an intrusive origin does not appear likely because of the fine grain size with a very shallow hypabyssal emplacement a possible exception. The presence of epidote most likely denotes alteration of pre-existing plagioclase. The soda plagioclase now present is a product of recrystallization. Therefore the rock has apparently undergone a thermal metatmorphic event and its metasomatic effects.

Rock B

In hand specimen Rock B is a light green-gray, fine-grained rock cut by a few irregular quartz veinlts about 1 mm thick, There is some suggestion of a planar structure.

Under the microscope the rock exhibits the characteristics of a flow. Feldspar laths are aligned in a parallel to sub-parallel manner which imparts the quite distinctive "fluid-banding" effect. The rock is fine-grained, averaging about 0.1 mm. Compositionally, the rock consists of about 60% plagioclase, 15% chlorite, 15% epidote, and less than 10% quartz. Plagioclase occurs as well crystallized laths, a few show twinning. Chlorite and epidote are generally interstitial to the feldspar, but some areas have a heavy chlorite concentration. Quartz is nearly lacking in the rock, but a veinlet about 0.6 mm wide extends through the section. About 3% of the section consists of opaque minerals. These appear to have a chalky white surface under reflected light and probably are leucoxene alteration.

The rock has been slightly metamorphosed. If it has been taken to amphibolite grade, then it has been retrograded. The chlorite could have been developed from original hornblende. In any event, the rock is an andesite flow.

Rock C

Rock C in hand specimen is gray, fine grained, and somewhat foliated. The rock has the characteristic silvery sheen of a phyllite on the folia. Noticeable quantities of fine grained sulfide minerals are present generally concentrated along crude layers or bands parallel to foliation.

Microscopically, the rock displays a very prominent lineation which is probably a primary feature, and could even represent flowage. Chlorite as very fine grained (0.05 mm) flakes constitutes about 40% of the rock. Quartz

is intermixed with chlorite. It is also fine grained, about 0.05-0.1 mm. Additionally, larger quartz mosaic aggregates or blasts up to 2.5 mm form rounded "eyes" which suggest infilling of amygdules. Quartz comprises about 30% to 35% of the rock. A little muscovite, 7% to 10%, occurs as tiny flakes in the chlorite. Epidote occurs in traces as widely scattered grains. About 15% of the rock is opaques, nearly all sulfide minerals. Pyrrhotite is dominant over pyrite and very minor chalcopyrite. Pyrrhotite occurs in somewhat scaly patches while pyrite occurs as smaller grains often exhibiting the characteristic cubic form. Chalcopyrite occurs as patches within pyrrhotite or as adjacent grains. A few tiny, dark amber, resinous grains were observed under high power in reflected light. These are believed to be sphalerite and constitute no more than a mere trace in the section.

The rock has evidently been silicified as a phase of the mineralization process. The original could have been an andesite, but a slightly more felsic composition, possibly dacitic, cannot be ruled out.

Beaver Springs Mine

In hand specimen, the Beaver Springs Mine sample (labeled ES on slide) is a gray, hard, compact rock with a fine lineation or lamination. Sulfides occur throughout the rock, and particularly along certain layers.

Microscopically, the Beaver Springs specimen shows a very fine scale lineation or lamination. The predominant mineral is quartz with an admixed mica-like mineral which is extremely fine grained with no discernible characteristics and a wavy undulatory extinction. It is believed that the mineral is sericite. The silica has a very slight undulatory extinction, less so than in other specimens in the suite. About 55% to 60% of the rock is composed of quartz, generally very fine grained, but some single crystals range up to 0.2 mm.

About 35% of the rock is composed of sericite(?) and perhaps some kaolinite may be included. The remainder of the rock consists of fine grained opaques, mostly sulfides. Pyrrhotite is seemingly more abundant than pyrite and chalcopyrite occurs with pyrrhotite and on sawed surfaces is noticeable as occasional coarser aggregate grains. Some dark resinous grains which are probably sphalerite are also present.

The rock, as now constituted, is an intimate admixture of quartz + sericite(?) with about 5% or so sulfides. This suggests that the rock has been severely altered by hydrothermal processes from an original andesitic or dacitic type. Alternatively, the high silica content could be explained by direct deposition by siliceous thermal waters in a hot springs system and subsequent metamorphic recrystallization which would yield a metasiliceous sinter.

Gold Note Intrusive

In hand specimen the rock is gray, tough, hard, and cut by a number of quartz veinlets 1-2 mm thick. There is no distinguishable structure and the grain size is very fine.

Under the microscope the rock exhibits a poorly developed sub-ophitic texture. About 70% of the rock consists of plagioclase, mostly in the form of laths about 0.4-0.5 mm in length. Chlorite and lesser muscovite and very little quartz are interstitial to the plagioclase. The plagioclase gives the impression of being of an intrusive origin and has been moderately epidotized. Chlorite occurs as ragged flakes and constitutes about 15% of the rock. Muscovite is prsent in the range of 7% to 10%. Quartz is present primarily in a few veinlets about 1 mm thick that extend through the section. It is definitely secondary, has a slight undulatory extinction, and is in part crowded with clusters of a fine, hair-like mineral which is probably rutile.

Quartz is not prominent in the rock itself. Accessory minerals and opaques are less than 1 %. Sphene was the most noted accessory and only a few grains of iron sulfide were seen in the slide.

The rock is apparently an intrusive, possibly a dike or sill. Dominant plagioclase and low silica content place the "Gold Note Intrusive" in the diorite classification.

Summary and Discussion:

Of the five samples studied, only Rock B presented few problems in interpretation. It is definitely a flow of andesitic composition. Rock C and the Beaver Springs Mine sample are both mineralized and even Rock A could conceiveably owe its abundant epidote content to alteration processes. The Gold Note sample is probably an intrusive rock in contrast to the others which are metavolcanics.

Rock C and the Beaver Springs Mine rock are the most important from the standpoint of mineralization. It seems likely that Rock C was originally a flow or ash flow tuff although subsequent metamorphism has masked and obscured the evidence. The layered sulfides are volcanigenic, or some related process, in origin. The Beaver Springs Mine rock is very interesting from several standpoints. It is considered possible that the rock marks an area of hydrothermal activity associated with a hot springs system. An interesting question in this regard is what is the precious metal content of this rock? Also, if this is the situation, what precisely is the relationship of this rock with the nearby Rock C. If they are more or less coeval, then a definite period of mineralization occurred during Rock C - Beaver Springs time and it may therefore be interesting to speculate on the potential existence of massive base metal

sulfide deposits off the flanks of the silicified Beaver Springs Mine (sinter?).

I. T. K.

IRVING T. KIFF
CONSULTING GEOLOGIST
418 SALUDA AVENUE
COLUMBIA, S. C. 29205