Views on the Bowser Creek Area
McGrath A-2 Quadrangle, Alaska

I have not had the pleasure of examining the Bowser Creek area. My Alaskan experiences have been confined to iron ore and base and precious metal prospects in the Alaska Range and in the Dillingham district and to geological engineering work on the Talkeetna-Willow section of the Anchorage-Fairbanks highway. Research was also carried out leading to the selection of Cape Thompson as a potential site for harbor excavation by operation "Plow Share".

All statements submitted and views expressed herein, therefore, are based on maps and reports provided by Mr. William B. Murray of Portland, Oregon (see attached list.)

General Geology

As shown on the attached map, the Bowser Creek area is as geologically complex as most of the mineral districts distributed along the length of the cordilleran ranges from Alaska to Tierra del Fuego.

Sedimentary rocks, principally limestone and siltstone, have been tightly folded and locally broken and dislocated by faulting. Igneous breccia has been injected into two structurally weakened areas, forming large breccia pipes, or chimneys, measuring several thousand feet in diameter. Four other localities have been invaded by granodiorite stocks of smaller dimensions. Felsite and mafic dikes also cut the sediments and are recognized as the youngest members of the igneous series.

Metal-bearing fluids have mineralized the sediments near the igneous bodies and minor mineralization has been found in the breccia pipes themselves. The more chemically reactive limestone strata have apparently been the most receptive to attack and replacement by mineralizing solutions.

finally, weathering effects, plus stream and glacial action, have loosened and removed a considerable thickness of the upper material, thereby decapitating the known breccia pipes and granodiorite stocks and exposing some of the mineralization associated with these intrusive bodies, but also destroying the mineral deposits that must have existed in and above the upper reaches of the pipes and stocks. It is discouraging to speculate that perhaps the best, or the cream of the mineralization, has been skimmed off the top of the pipes and stocks by erosion, but it is also tempting to speculate on the possibilities for similar bodies lying at no great depth and with their tops and caprocks still more or less intact.

Mineralization

Mapping and prospecting thus far have revealed fissure-replacement veins and skarn zones in limestone near the breccia pipes and granodiorite stocks. Locally, zinc, lead, copper and silver values are attractively high. The habit of the mineralization seems to be one of small discrete veins and of skarn lenses and pods containing scattered ore deposits of insufficient size and grade, either individually, or in aggregate, to offer promise for a sustained, viable operation. Vein-replacement deposits and/or contact metamorphic deposits of attractive grade and volume could exist in the zones prospected thus far, but I find it perplexing, on the basis of the data available to me, to offer intelligent suggestions on a drilling, trenching or additing program designed to explore for such deposits.

It is assumed likely that the source(s) of the metallizing fluids was at some depth below the intrusive breccia pipes and granodiorite stocks, and it is further assumed that such fluids were released upward from their deep-seated reservoir(s) in the direction of decreasing pressure. Escapeways for the fluids were fractures and other openings in the consolidated hoods of the intrusives, as well as in the overlying country rock. Deposition of

metallic sulphides by fracture filling and/or by replacement of adjoining rocks started when temperature, pressure and concentration relationships were in favorable balance and ended when such balance shifted or ceased. Doubtless, a fourth essential factor was a more or less continuous fresh supply of metal-bearing fluid flowing through a system of openings with inlets and outlets.

Fractures that offered restricted inlets or outlets, or that soon became plugged by mineral deposits, were bypassed before the ore-making fluids could penetrate into all of the ramifying openings and hairline fractures and to continue from these to the replacement of large volumes of rock. It is possible that the mineralization observed to date in the Bowser Creek area falls in this category. The veins and skarn deposits lie in limestone along the flanks of the intrusives, and possibly represent the products of a more or less "one-shot" treatment due to early blockage of passageways with no or inadequate outlets for spent fluids or solutions.

Assuming the above concept is correct, or essentially so, the problem of orebody hunting becomes one of looking for a locality where all four of the ore-fluid properties (temperature, pressure, concentration and persistency of flow) were in optimum balance for a long enough period to build a substantial orebody. The most likely hunting place, in my opinion, would be in the hoods of intrusives, particularly in the hoods of breccia pipes and in the country rocks resting on these hoods. Unfortunately, the hoods have been removed from the two large pipes exposed in the area, as well as from the larger three of the exposed granodiorite stocks. However, chances of finding concealed mineralized hoods are judged to be good enough to merit further exploration.