

**Geology.**—The rocks which underlie most of the gold-bearing district consist of altered quartz-porphyrines, and porphyrites, probably of pre-Cambrian age, which have been squeezed and altered into chloritic and sericitic schists. In most places these are now standing at high angles and are striking in various directions.

Included in these schists, and usually running with their strike, are numerous veins and stringers of light coloured quartz. In some of these veins free gold has

would not appear to contain as much gold as the veins in the chloritic and sericitic schists previously mentioned.

Intrusive masses of igneous rocks, such as granite, peridotite, diabase, andesite, etc., occur here and there around the border of the chlorite schists, but as far as is at present known, there is no definite connection between any of these intrusives and the occurrence of gold-bearing veins.

Overlying all these rocks, except the andesites and their associates, Cretaceous or early Tertiary sandstones—and conglomerates occur to the north and south of the chlorite schists. In some cases they would appear to have been somewhat folded and contorted, though not to the same extent as the older rocks.

It has been claimed, apparently on good evidence, that some of these conglomerates contain gold, and they may thus be ranked as ancient placer deposits, but gold has never been found in them in paying quantities, and consequently they have not been studied as fully as the later gravels shortly to be described.

In all these rocks, but especially in the chloritic and sericitic schists, which have been called by Mr. McConnell, of the Geological Survey of Canada, the "Klondike Series," gold is found in greater or less abundance in the quartz veins which traverse them. It has also been found in the schist in minute quantities apparently not associated with the quartz at all.

These facts should be carefully borne in mind for all the gold in the detrital and placer deposits in the Klondike has been derived directly from these altered rocks occurring in the immediate vicinity of the alluvial deposits.

The gold of the Klondike occurs originally or primarily in quartz veins in the chlorite and sericite schist chiefly of the Klondike Series, as defined by Mr. R. G. McConnell.

These quartz veins are usually lenticular in shape, and rarely continue for more than a few feet in horizontal length. As a rule very little gold can be seen in them. As a result of a number of assays I found that while they usually showed traces of the metal, they rarely contained more than \$1 to the ton. In some cases, however, notably in some quartz veins near the heads of Gay and Victoria gulches, two tributaries of Eldorado and Bonanza creeks, these veins were seen to contain coarse nuggety gold associated with pyrite. Some of it was distinctly crystalline in character, and among the crystals were a number of small triangular plates representing "spinel twins," the twinning being parallel to the octahedral face of the crystal. I had found some of these crystals in gold dust brought from Victoria gulch in the early days of mining in the Klondike, and afterwards, while examining the quartz veins at the head of the gulch, in company with Professor Henry A. Miers, F.R.S., we found a few more crystals of a similar character. Some of the crystals found on Claim No. 7, Victoria gulch, are represented on Plate 1.

In addition to the gold found in the quartz veins it is possible that some is associated with the schist itself. But none of the quartz veins so far discovered have proven rich enough to be worked at a profit, and the gold production of the Klondike has been derived exclusively from its placer deposits.

**Placers.**—Placer deposits may be defined as "Detrital deposits of heavy metals or minerals mechanically concentrated by natural agencies."

The Yukon Placer Mining Law gives the following definition: "Placer ground means any natural stratum or bed of earth, soil or gravel, containing gold or other

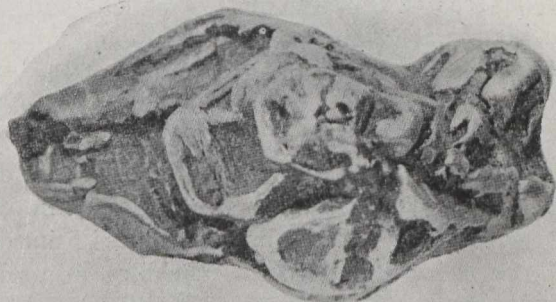


FIG. 1

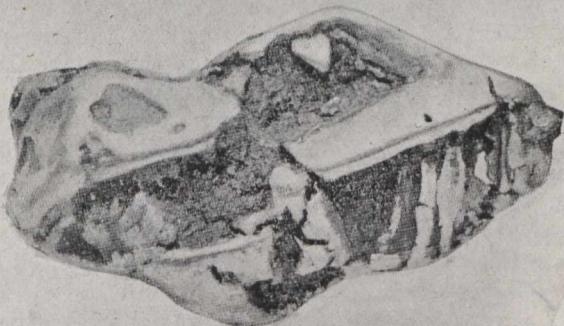


FIG. 2

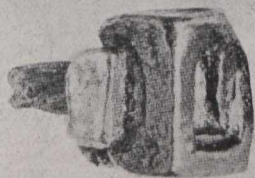


FIG. 3

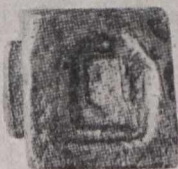


FIG. 4

**Figs. 1 and 2—Spinel Twin with hollow faces.**  
**Figs. 3 and 4—Cube with hollow faces, &c.**  
**Gold Crystals.—Magnified 2½ diam.**

been detected, and it would appear probable that most of the gold in the district has been associated with, or has been derived from, these quartz veins.

Both to the north and south of these fissile schistose the rocks are highly altered gneisses or hard quartz-mica schists, containing some bands of limestone. These gneisses, etc., also carry irregular quartz veins, and these veins doubtless also contain a little gold, but they