

## GENERAL GEOLOGY

Geology is a very complex subject. It takes a great deal of study, time, and field experience to gain the knowledge and ability to identify the natural environments in which minerals are usually found. It is not practical to write a complex chapter on geology for the purposes of this book. Although most common minerals can initially be identified by appearance it is also helpful to have a general understanding of the natural environment or rock formation that hosts them.

The primary mineral elements are identified in one of the three major groups. These groups are metals, semi-metals, and nonmetals. The metals group consist of six elements; Copper, Gold, Iron, Mercury, Platinum, and Silver. The semimetals group consist of two elements; Arsenic and Tellurium. The nonmetals group consists of three elements; Diamond, Graphite, and Sulfur.

Gold is found in a wide variety of environments. Gold located in rock formations is commonly referred to as 'vein' gold. Vein gold is most commonly found in quartz veins, sulfide veins, and iron stained rock that has been freed of sulfide. Displaced gold commonly referred to as 'placer gold', occurs when gold moves from it's original host environment. Placer gold is most commonly found in creek and river beds. The prospectors rule of thumb for looking for the vein source of placer gold is; 'the rougher the placer gold the closer the vein'.

Jackson clearly states in his letter that the gold carried quartz. Few will argue that this identifies a gold vein in the immediate vicinity of his placer discovery. His letter offers significant geological clues to the location, such as; 'The water was almost white, the formation for the most part had been slate and granite, but there I found a kind of schist slate formation'.

Gneiss, Hornfels, Marble, Phyllite, Quartzite, Schist and Slate are all members of the Metamorphic Rock family. Metamorphic rocks characteristically contain common high-temperature primary minerals such as quartz, feldspar, mica and garnets.

Metamorphic formations are stratified. Stratification is also frequently referred to as banding or banded rock. Metamorphic formations usually contain concentrations of a single mineral. The stratification gives the loose appearance of waves or twisting in the rock. An excellent example of stratification can be seen in the

mountains around Hedley, B.C. The vast amounts of gold extracted from the gold mine at Hedley over the years is also a prime example of the high concentration of mineralization found in such formations.

Schist is the third and final product of the geological evolution of clay to mica. The first stage in this evolution is Slate the second stage is Phyllite. Schist is distinct from any other primary rock because of its mica banding and domination of a single mineral such as garnets and kyanite.

Gneiss is also of interest because it is difficult to distinguish the differences between it and schist and gneiss can range from gray to white in color. Was Jackson confused about what type of rock formation he had found when he said, 'a kind of schist slate formation' or was he referring to a formation his friend could identify? When he states, "the water is almost white," a most curious reference, was he possibly referring to white gneiss which, again, he thought his friend could identify?

There are several Metamorphic rock formations scattered throughout the overall search area. Stratification is more prominent in some areas than others. As I pointed out in my introduction, nothing should be ruled out until the gold is literally in hand. However, after dismissing several areas, my own attention was focused on the stratification found in the Terrarosa Glacier area. 'Stu' Brown also made reference to this formation and it can also be seen very clearly from where 'Doc' Brown's last camp is believed to have been located.

In the context of Jackson's letter it is interesting to note that each quadrant of Terrarosa Glacier is bordered by a different geological formation. The north and south boundaries are a Hornblende Migmatite formation, the west boundary is a predominantly Hornblende Quartz diorite formation, and the east boundary is within the Fire Lake Group.

For reference purposes, I have included a basic geological map of the overall search area. The map is not to scale. The park boundaries are not included and some of the small geological outcroppings are not identified because of the map size.