(Continued from page 3.)

simple stripping and opening sufficiently to prospect or locate the deposits. No exploration has been made for mineral-bearing veins, and no attempt made to arrive at the origin of the placers. Only two stamp-mills exist in all the Transbaikal and only in one place is there any attempt at deep mining.

In the Oural, where working has been continued for many years, the formations are well understood. In that region the formation is composed of chloritic, argillaceous and talcose schists, traversed by veins of eruptive rock, locally called berezite, which is, in fact, a granite from which the feldspar has disappeared, leaving in the remaining rock as constituent elements quartz and white mica. These veins of berezite vary in width from a four to forty meters. They are in turn divided by numerous small veins of quartz averaging perhaps five centimeters in thickness. These veins are generally distributed in groups separated by greater or less intervals, and their direction is usually almost perpendicular to that of the veins of berezite.

All these quartz veins carry some gold. It is accompanied by pyrites and by the ferruginous ochre and iron brown hematite resulting from the decomposition of the pyrites. Gold is scattered through the mass of quartz and in the hematite, but is rarely found with the other materials in the veins, which are numerous such as chalcopyrite, galena, etc.

The berezite, and sometimes the surrounding schists, carry also some gold in such a way that it would seem as if the quartz veins had concentrated the metal which originally impregnated the whole mass of rock. The deposits of this nature, that is where the gold is disseminated through the gangue or mother rock, have been explored to some extent, but generally they do not carry gold enough to warrant working them. Thus the berezites of the Ouspien and Kionetzeff mines carry only about 2.36 grains of gold to the ton. The microgranulites of Pisminskagora vary from 0.65 grains up to 10 grains per ton, while the serpentine gangue varies from 1.30 to 2.30 grains.

We shall see that a rock similar to berezite—that is, a rock derived from the original granite by the disappearance of one of its elements—is everywhere a mineral-bearing rock, like the berezites of the Oural. This rock is aplite, that is, granite without mica. The description of the veins found in this rock are almost exactly the same as that of the quartz veins in the berezite, with this difference only, that the mineralizing action in Eastern Siberia has apparently been much stronger than in the Oural, and that the veins of gold-bearing quartz reach an average thickness of at least an archine (0.71 m.) instead of 5 centimeters.

As to the gold in the aplite, I made a very interesting study on specimens of this rock heavily charged with pyrites taken from the mine of Baian-Zourga in the Onon group. In this case there were 5 kg.—0.5 per cent.—of pyrites to the ton. The quantity of gold to the ton was 0.50 grains.

The presence of gold in the aplite and the berezite, both rocks derived from granite by the absence of one of its constituent elements, and indicating in consequence the end of the eruptive period, permits us to believe that the gold was deposited at the same time with these rocks, and probably in a state of combination with iron pyrites. It was set free near the summit of the vein when the iron was converted into an oxide, and was concentrated with the silica in the crevices due to the cooling of the heating mass, as well as in those produced in the surrounding schists in the breaking up following the eruption of the igneous mass.

The cooling should, in fact, have affected equally the surrounding schists, which must have been highly heated and metamorphosed by contact with the eruptive rocks. It produced in them crevices which have also been filled with gold bearing quartz. This would explain the number of quartz veins which are observed in the schists. According to the theory which I have outlined, these veins are not necessarily continuations of those found in the mother rock. The vein filling is similar, but the causes of the formation are different. This is everywhere shown by observation.

Sevesal facts serve to confirm this description of the origin of the gold-bearing formation in Siberia. The first is the decrease of richness in depth which has followed in almost all mining in the Oural, and which we have to expect in Eastern Siberia. This theory would seem to prove that we shall not find free gold below the line where the iron has been transformed into oxide; consequently, it will be necessary to provide machinery and methods for treating ores carrying gold in combination with the pyrites whenever we pass below the line of oxidation.

We may say in conclusion that aplite is frequently found, especially in the vicinity of the quartz veins, as an altered rock transformed into a characteristic clayey mass, white or reddish in color. Elsewhere the rock, having preserved its hardness, has nevertheless lost a notable portion of the silica which it contains. Cracks, sometimes filled by ferruginous ocher, show the decomposition of the iron pyrites and the formation of a brown hematite, which in its turn has disappeared.

I hope that I have clearly shown the important part played by the phenomena of concentration posterior to the formation in the Siberian gold-bearing formations. Whether we talk of pseudo-granite rocks, such as aplite and berezite, or of more basic rocks, porphyrys and serpentines, the phenomena of the appearance of gold remain the same. The precious metal appears to have come at the same period as the eruption of these rocks, in combination with iron pyrites or according to more recent researches with silica itself, and it has been deposited by segregation in the cracks and crevices caused by the natural shrinking of the heated mass, or in those produced in the surrounding rocks by the disturbances which followed the eruption.

CERTIFICATE OF IMPROVEMENTS.

EMERALD MINERAL CLAIM.

Situate in the Trail Creek Mining division of West Kootenay district. Where located: East of and adjoining the town of Rossland.

TAKE notice that I, N. F. Townsend, acting as agent for Hirschel Cohen, free miner's certificate number 7584, intend, sixty days from the date hereof, to apply to the Mining Recorder for a certificate of improvements, for the purpose of obtaining a Crown grant of the above claim.

And further take notice that action, under section thirty-seven, must be commenced before the issuance of such certificate of improvements.

Dated this 23rd day of November, 1896.

69 N. F. TOWNSEND.