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NOTES ON THE GEOLOGY OF THE GOLD FIELD OF CRIPPLE CREEK, COLORADO.

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THE granites surrounding the mineral district of Cripple Creek are of the ordinary types common to the Front Range. They vary from moderately fine to coarse grained in texture. Bedding structure is generally rather indistinct, but in places is strongly marked, and the rock may be more correctly styled gneiss. The quartz in these granites is either of a vitreous translucent or milky variety; the feldspar (orthoclase) usually pink. Biotite is the common mica, but other micas are met with, especially close to the mineral belt; one of these varieties being a black mica with splendent lustre, sub-translucent and dark green by transmitted light. It is strongly iron-bearing, very easily fusible to a black globule and is undoubtedly closely allied to, if not identical with, lepidomelaur.

In the granite ridge bounding the town of Cripple Creek on the west, are seen veins of amorphous, white or rose quartz, often six inches or more in thickness, apparently dispersed without relation to bedding structure, or order of any kind. Similar veins consisting wholly of pink feldspar occur in the same manner. Nests of large tabular prisms of a black mica (lepidomelaur) are also met with. Much of the granite here is of a very coarse texture, the various constituents being often an inch or more in diameter. These veins of quartz and feldspar, the nests of mica, as well as the very coarse textured granites, may all be attributed to a common cause, and have every appearance of having been formed contemporaneously with the consolidation of the containing granite. To the east of this ridge, in the town, as well as in other parts of the district, there occur "endogenous" veins of quartz, associated with parallel veins of feldspar, which are two or three feet in width and may be traced some distance in approximately straight courses. These veins are probably of secondary origin—concretionary veins—due to causes similar to those to which the various alteration belts of rock of the mineral area may be attributed. From the normal granites surrounding the district, towards the centre, occur innumerable phases of altered granitic rocks. Schists, aplites, felstones, conglomerates and breccias abound in numberless varieties, and transition rocks have been observed linking together rocks of very different appearance. Although this region is laid down on Hayden's maps as "eruptive," no true eruptives were seen *in the mineral belt proper*, with the exceptions of a black magnetic dyke in the town, and the rock composing what is known as "Bull Cliffs." These eruptives will be discussed further on. To give distinctive names to the various altered rocks of the district would be as difficult a task as attempting to name the shades from blue to green. Some sort of a classification of the most marked types should, however, be made. The nomenclature in use by the miners is confusing in the extreme and renders an attempted description of the country rock of a mine unintelligible. Granite, schist, porphyry, quartzite and trachyte are the miners' rocks. The term granite is applied to the binary granites as well as to the normal granites, if the rock is coarse-grained and the feldspar still pinkish, but if the feldspar is white, some call it "porphyry," while others speak of it as "quartzite," the choice of terms depending, probably, on their individual preference for the one or the other as a country rock for their claims. These micaless granitic rocks are from course to fine granular in texture—some even passing into a microcrystalline aggregate. In color they range from white, through bluish-gray and gray, to yellow or brown. Some are pyritous, some mellose, in a fine grained magma, porphyritic crystals or blotches of white feldspar; while others have a leached-out appearance and are often colored yellowish or brownish by iron oxides. Curiously, this last-mentioned type is the one universally called "porphyry" by the miners. It composes the walls of many of the best mines (especially near the surface at depth passing into a grayish, often pyritous felstone) and is a favorite country rock. In the veins it often forms a veinstone, seamed with secondary quartz carrying gold. This so-called "porphyry" is sometimes beautifully zoned with concentric rings of brown or yellow, due to the oxidation outward of iron salts—the rusty bands giving the rock a riband appearance. The interior of such rocks is generally found to be a fine granular, gray material somewhat resembling sandstone, and often containing small grains of white iron pyrites. The micaless granites, where coarse in texture, might be termed "aplites," the fine-grained varieties "felstones." By prefixing descriptive adjectives, such terms as porphyritic gray felstone, pyritous felstone, yellow or brown felstone, etc., etc., would convey some idea of the character of the rock under discussion. There are two distinct mica schists in the camp. In one the mica is a black iron-bearing variety, the rock often appearing to be a disintegrated granite with schistose structure and very friable. This rock is considered an unfavorable country rock. The other schist is a tough, laminated, white rock, the mica being in large leaves of glistening, silvery-white muscovite (or a hydrous alteration variety of muscovite). This latter rock occurs in bands through the heart of the mineral area and in one or two instances was seen apparently bedded with beds of coarse granular, white "aplite" lying conformably upon its dipping surfaces. Some good mines are found in this rock, or rather on its contact with other rocks. The "Bull Cliffs" eruptive is locally called trachyte. The term is not, however, confined to this eruptive, but is given to many dark varieties of rock, of various structure, some of which bear a strong eruptive appearance in hand specimens. Some of these rocks are hard and compact, ring when struck with a hammer, and often contain small grains or prisms of hornblende. These rocks are usually in dark shades of gray and are occasionally exquisitely traced with imitative figures resembling trees, ferns, etc., due, doubtless, to a saturation of the rock with water, which, acting on