

On the ridge running south from Lake Mountain is a set of rocks differing entirely from any seen elsewhere in the district. They consist of medium- to coarse-grained, reddish weathering conglomerates. The rounded and sub-angular fragments range in size from grains up to boulders a foot or more in diameter. The most common varieties are quartzite, slate, chert and granite. The conglomerate area is small and is probably a fragment of a Tertiary plateau which has escaped denudation, but its relationship to the surrounding rocks was not clearly ascertained owing to the absence of good exposures along its border.

This series includes a great number of different varieties of massive, brecciated and ash rocks, and may possibly include rocks of different ages. The principal varieties represented are: augite-porphyrates, augite- and hornblende-andesites, fine-grained diabase, tuffs, agglomerates and slates. Near Rossland the porphyrites and associated rocks have been brecciated, and farther to the north on Stony and Murphy Creeks they have been crushed into a schistose condition. No precise line can be drawn between the gabbros of Rossland District and the surrounding semi-crystalline porphyrites, etc., and it is inferred that both series represent portions of the same magma cooled under different conditions. Tuffs and agglomerates are largely developed south and west of Rossland and in other places. They have an average strike of about 10° west of south and dip to the west. They occur as fine-grained dark and green slates, medium-grained greenish rocks usually indistinctly foliated and as coarse agglomerates carrying angular fragments of quartzite, slate, limestone, granite etc., several inches in diameter. On Sophie Mountain and in other places small bands of coal-bearing limestone are associated with the agglomerates. The coals are poorly preserved but are probably referable to the Carboniferous genus *Lonsdaleia*.

The altered basic igneous rocks included under this color are completely serpenitized in places, but over the greater part of the area the alteration is more or less incomplete. Sections of the partly altered variety show augite passing into serpentine, and it is probable that the greater part of the serpentine is an alteration-product of that mineral. The matrix of the agglomerates on Sophie Mountain and in other places shows partial serpenitization in spots.

The area marked gabbro on the map, represents, according to present knowledge, an ancient but now deeply eroded, volcanic centre from which issued, in part or altogether, the surrounding effusive and tuffaceous rocks. The gabbro has a more or less distinct diabasic structure in places and varies considerably both in texture and composition. They occur as a rule as a medium-grained, little altered greenish rock, consisting of plagioclase, pyroxene, biotite, iron sulphides, and occasionally quartz in appreciable quantities, with uranite and epidote as the principal alteration-products. A coarse-grained pegmatitic variety occurs in patches along the northern border, and irregularly shaped areas, more acidic than the ordinary form, are of common occurrence. The gabbro area is important from an economic standpoint, as most of the larger lodes of the district are situated either on or close to its border.

These rocks consist largely of foliated granites, contemporary in age with the main granite area of the district, but also include micaceous and other schists, representing highly altered portions of the formations through which the granites were erupted. Pegmatite dykes following the strike of the schists are of frequent occurrence in this area. The granite-gneisses and schists have a common north-and-south strike, and dip in an easterly direction, usually at low angles. The pegmatites also, are usually more or less distinctly foliated in the same direction.

The younger granites are medium to coarse-grained intrusives, differing in appearance from the older granites in their light pinkish coloration, and in the marked absence on the faces of the felspar crystals. The principal constituents are orthoclase, plagioclase, quartz, hornblende, biotite, augite, magnetite, apatite, zircon, titanite, and allanite. They have been subjected to considerable crushing, but no distinct foliation was noticed. They are probably Tertiary in age. Besides the areas marked on the map, a number of smaller bosses cut the older rocks in various places and it is probable that the numerous syenite-porphry dykes met with throughout the district belong to the same period of eruption.

The older granites have a light to dark grey color, a medium grain, although coarsely porphyritic and fine-grained varieties are of occasional occurrence, and consist of orthoclase, plagioclase, quartz, biotite and hornblende in varying proportions, with titanite, epidote and iron ore as the principal accessory constituents. They are massive as a rule, but in places, especially towards the borders of the area, show more or less foliation and pass into granite-gneisses. They are Post-Carboniferous in age and were probably erupted about the close of the Tertiary period, like the similar grey granites of the Kamloops District.

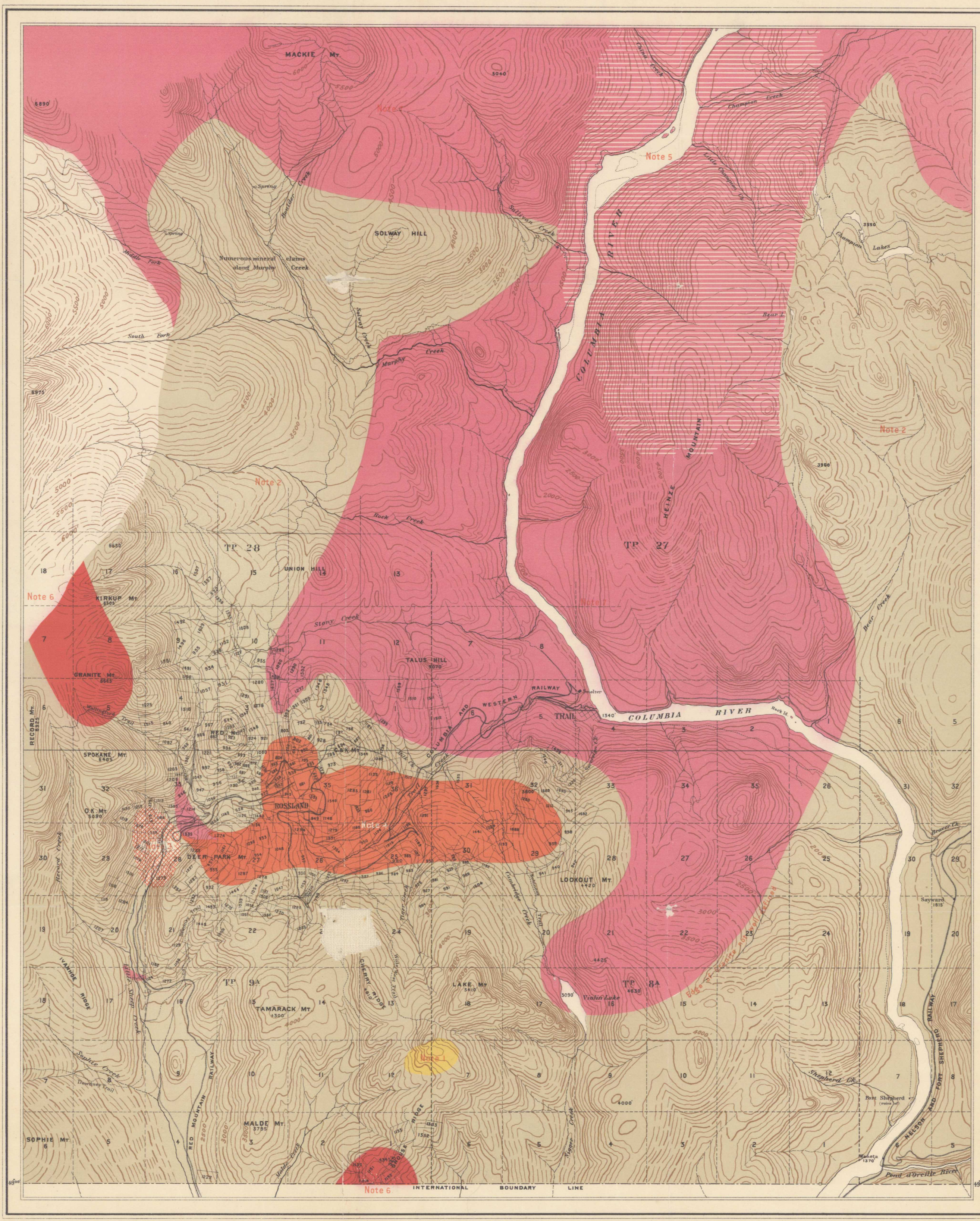
The sulphide ores of the district are associated principally with the basic igneous rocks, and especially with the central gabbro area, around which the principal mines so far worked, are grouped. The veins have an approximately east-and-west strike, and, with few exceptions, dip to the north at high angles. They follow lines of fissuring and, so far as present evidence goes, belong to the class known as "replacement veins." The lodes are somewhat irregular and vary in size from small stringers and disseminated grains to great ore-bodies, forty feet or more in width. The principal ores are pyrrhotite and chalcocite, often associated with pyrite and mispickel, and occasionally with molybdenite. Cobaltiferous mispickel or danite occurs at the Fleming Star; and perovskite, a sulph-arsenide of nickel, at the principal mine at the Columbia-Kootenay. Besides the above minerals, galena and blende occur in some of the mines situated near the outskirts of the main mineral area. The ores are often more or less siliceous and calcareous, and occasionally met with in seams and pockets, but, as a rule, the principal gangue is the ordinary country-rock of the district, usually only slightly altered. The gold contents of the ores are exceedingly variable, ranging from traces up to several ounces per ton. The smelter returns of 1,200 tons of Le Roi first-class ore are given by Mr. Carlyle as 2.5 oz. of gold, 1.8 oz. of silver and 2.5 per cent. of copper; and of 1,800 tons second-class ore as 1.34 oz. of gold; 1.4 oz. of silver; and 1.6 per cent. copper.

Fissure veins filled with quartz gangue are occasionally met with in this district. The best known of these is the O. K. mine, situated west of Sheep Creek, but a number of locations have also been made on Murphy Creek, Granite Mountain, and other places. The veins vary in size from a few inches to six feet or more and carry free gold and auriferous iron, copper and lead sulphides.

Geological Survey of Canada

GEORGE M. DAWSON, C.M.G., LL.D., F.R.S. DIRECTOR

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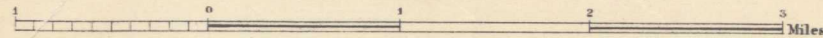
Compiled and drawn by Jas. M. Egan, B.A. Sc. from original surveys and plans of railways and Dept. of Lands and Works, B.C.

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BRITISH COLUMBIA PART OF TRAIL CREEK MINING DIVISION West Kootenay District

Natural Scale 63360

Scale 1 mile to one inch



Geologically surveyed by R. G. M. Connell, B.A.

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