

hotite is also present and may increase with depth. A quantity of these ores have been packed out to Hope and providing a good waggon road were built could with advantage be shipped to the coast.

A little further east and abutting on this slate belt is an ancient crystalline mass of very basic rocks (2). This is represented on the river by a rock of coarse crystallization of quartz, lime and pyroxene. At the head of Slate Creek this is almost a pure pyroxenite, is placed shered to a schist and much serpentinized with many small and at least one workable vein of fibrous serpentine unscaled asbestos. Quartz veins are numerous, and in all cases carry values in gold and copper. The country rock is heavily impregnated with chrome iron and magnetite and there is little question but that this is the mother country of the platinum which is found in all the creeks draining this watershed. Numerous assays have, however, failed to prove the existence of this metal in situ on the veins and it is probably scattered through the country rock in fine grains or in conjunction with the chromic iron. The adjoining hill between Cedar Creek and Collins Gulch are as illustrating the curiously broken character of the geology covered with a heavy capping of volcanic breccia and trap which outcrops in the Tulameen River just above the junction of Otter valley and immediately east of this is a considerable basin (part of it possibly underlying the volcanic rocks) of early Tertiary coal measures carrying a very good class of coal with 60 per cent. of carbon (4 on map).

It is quite possible that these measures may overlie the original drainage channel of Granite Creek which is at present undoubtedly flowing in a recent channel. This could only be proved by boring.

The configuration of the ground at the heads of these creeks, which have all been valuable placer grounds, would seem to indicate that apart from later erosion from visible quartz veins there has been considerable concentration going on from some long existing drainage system which has left patches of an ancient valley filled with gravel on the tops of the highest mountains and which it would appear ran in an opposite direction to the present drainage. Parts of this old channel are probably covered both by the coal measures and the adjoining volcanic rocks, which, it is possible, may have been the means of directing the direction of the drainage. This is particularly applicable to area 5, which is largely granitic, and where swamps and small lakes are filled with gravel. In this area, as in 3, numerous quartz veins are found carrying sulphides of iron and copper with varying values in gold. Serpentinization is everywhere apparent, and erosion has been so great that the present quartz veins probably represent a section of the veins thousands of feet below the original surface. Between 5 and 6 the Tulameen River has cut deeply into a series of green stone and dioritic rocks which are capped by heavy masses of porphyritic rocks which show in the river further down towards Princeton as filling the whole valley with very high perpendicular bluffs in the canyon. The green stones, etc., show numerous iron croppings of veins along the bluffs, some of which are being exploited as claims. This portion of the river bed was rich in gold probably due to these veins. The volcanic rocks mentioned above cover both the edge of this series and also of the tertiary basin surrounding Princeton and

filling the valley of the upper Similkameen. Going down the Tulameen we meet the first outcrop of coal measures about two miles above Princeton in the form of an immense bluff of very highly colored rocks varying from the deepest vermilion to salmon pink, orange, blue and deep black.

The shales of which this is composed are interspersed with thin layers of silicious sinter, evidently due to thermal action. It is from this coloration that the old name of the junction of the Tulameen (Red River) and Similkameen (Yellow River) takes its name of Vermillion Forks. It has evidently been caused by the burning of underlying seam or seams of coal which has oxidized the contained sulphides, something perhaps also being due to thermal action by which the silicious sinter and adjoining volcanic breccia were formed.

It was at one time a source of considerable profit to the Indians who traded it as war paint, etc., with neighbouring tribes, the deepest tint being exactly that of Indian red. It makes very good paint, which has been used locally, but there being no facilities for grinding, it remains gritty. For exploiting on a large scale it would probably be difficult to obtain enough of one tint. On following down stream to Princeton many outcrops of coal are seen in the river bed, their strike approximating east and west. These same outcrops appears in the Similkameen River on going south from Princeton. Immediately at Princeton an eight-foot seam of coal has been to some extent developed by a 60 foot drift and though owing to the proximity to the surface it has probably not reached the extreme of surface oxidation it gives an analysis as follows, an average of many:

Moisture	4.5
Volatile matter	37.5
Fixed carbon	50.0
Ash	7.5
	<hr/>
	99.5

Burnt in an open fire it leaves a small quantity of white and pink ash, throws out a good heat and lasts a long time. It makes a very good blacksmith's coal, giving a good heat, and the small percentage of sulphur not materially affecting the weld. It clinks under the blast and requires stirring. It has made good coke in the laboratory. The outcrops of four seams of workable thickness are exposed in the river banks over a distance of nine miles south of Princeton, though owing to the folding these may be only the outcrops of two seams. The basin in which these coal measures lie is about nine miles long by four broad and the edges being on three sides overlain by later volcanic rocks, it is probably much larger. Owing to its being surrounded on all sides by mountains carrying minerals in paying quantities any question of fuel for the reduction of these ores becomes of great interest and in this connection should be noted the existence of several excellent beds of fire-clay. Some of the sandstone makes excellent building stone. The coal measures are the bedrock for benches of gravel all more or less auriferous. These benches have been and are the subject of exploitation by hydraulic companies. Water is fairly plentiful and the gold content quite enough under ordinary conditions to pay well for hydraulicking on a large scale. The gravel is very heavy and there being no clay or