

and Boston Bar (nearly opposite North Bend on the Canadian Pacific Railway), it breaks through the axis of the Coast Ranges, flowing in a series of wild rapids through a ragged gash in the mountains. Along the sides of this canon, a scarcely passable goat track existed when the gold miners first arrived on the scene. Beyond Boston Bar the valley becomes a direct and deep north-and-south furrow all the way to Fort George in latitude 54°. The southern part of this portion of the valley cuts obliquely through the inner tiers or flanking ridges of the Coast Ranges, but its northern and upper part is excavated in the plateau of the interior to the east of these ranges. From the point of view of the gold miner, the Fraser may be regarded as a gigantic ground-slucice. Its valley, originally excavated in Tertiary times, in the rocky substratum of the country, was subsequently, during the glacial period, largely filled with drift material; through which, at a later date, the river has had to re-excavate its bed, leaving great series of terraces or 'benches' along its banks in many places, as this was gradually accomplished. A portion of the gold now found in its bed and banks has without doubt been worn out of its rocky matrix directly by the action of the river and its immediate tributaries, while another portion may have been derived from the glacially transported drift materials. The first mentioned moiety may be supposed to include the 'coarse' gold, the last must be in great part 'fine' gold."

"The mode of working these gold deposits was comparatively a simple one. The so-called 'bars' were nothing more than portions of the river-bed, which, being left bare at low water, could be reached by the miner. They varied in richness, not only in different parts of the length of the river, but also in correspondence with the local relation of the currents and sets of the stream. They were worked generally to but a very limited depth, being often merely skimmed over, in consequence of the trouble from water and the cost of removing any considerable thickness of non-remunerative material to reach deeper underlying pay-streaks. Most of the work was accomplished with the primitive rocker, and in 1858 no other means was employed on that portion of the river below Yale. At Yale and further up, even in that year, sluicing was resorted to in some places, and a number of short ditches were constructed for the purpose of bringing water to the places washed, etc.

"A great number of the high benches have been in part superficially worked, and have in some cases yielded excellent results. In the bed of the river itself, at each season of flood, a particular rearrangement of material occurs, and additional supplies of gold are brought in by the wearing away of the banks, a feature having important bearings on the probable successful applications of hydraulic mining to some of these deposits. Though no longer exceptionally rich, the bars and branches of the Fraser seem to afford a practically inexhaustible supply of gold. Had no further discoveries occurred in the north, the Fraser would not so soon have been deserted by the energetic white population, but with the gradual improvement in methods of mining would have been made to yield a vastly greater amount of gold than it has yet produced. Nothing illustrates the fact more forcibly than the table given below of the annual yield of the river during late years. Hill's Bar, near Yale, has probably afforded more gold than any other single locality on the Fraser. It was estimated to have produced in all (to 1875) not less than \$2,000,000 worth of gold from a total area of less than half a square mile."

"It scarcely, I believe, admits of doubt, that extensive and successful mining enterprises, based on the application of the hydraulic method of working, will yet be instituted along a great part of the length of the Fraser valley, while dredging or other methods by which the materials of the bottom may be obtained and treated, may also be profitably employed. *The great extent of the bench or terrace deposits of the valley, with the excellent opportunity of disposing of the waste, offer exceptionally favorable conditions for hydraulic work, and tributary streams with a sufficient quantity and head of water for mining purposes are not wanting.*

"It may further be observed, that gold has been found on the Anderson River, on Lillooet River, and on Bridge River, all nearly on the line of strike of the Anderson River series and the overlying Cretaceous rocks, in such a manner as to mark out pretty distinctly the course of an auriferous belt to the east of, and parallel with, the axis of the Coast Ranges.

"The future of placer mining deserves consideration, particularly from the following points of view:

"1. In each proved auriferous district, the poorer or less concentrated gold-bearing ground must necessarily greatly surpass in area that of the very rich deposits which alone pay for work with primitive appliances and with the cost of supplies and labor at high figures. Thus the cheapening of these essentials, produced by improved means of communication and by the settlement of the country, coupled with the attendant facilities for bringing heavier machinery and appliances into use, will

enable the profitable working of greatly extended areas. These considerations apply particularly at the present time to the region of country in the vicinity of the railway, or connected with it by easily travelled routes. By the construction of the railway, a large part of the Kootenay district, together with that bordering upon the lower part of the Fraser, has been opened up for work of this kind, and deserve particular attention. The hydraulic method of mining will doubtless rank first among the means to be brought into use for the utilization of the poorer deposits.

"Another point deserving consideration is the further exploration of the already known rich deposits of gold confined principally to the old buried channels of the streams."

## British Columbia Creeks and Rivers.

Dr. Dawson speaks about a few British Columbia creeks and rivers successfully mined, as follows:

"CAYOOSH CREEK.—Diggings discovered in spring of 1886 by Chinese. Gold worth \$18 to \$18.50 per ounce. In 1886 yielded 725 ounces. Yield in 1888 estimated at about \$52,000. Remunerative work has been carried on here uninterrupted since the discovery. The gold obtained is on the lower ten miles of the creek, below the outcrops of certain gold-bearing quartz-vein, from which the placer gold is supposed to be derived. This creek affords a remarkable instance of rich placer deposits, which have remained long undiscovered in a country supposed to be well-known. Mr. Phair, Mining Recorder, writes: 'It seems almost incredible that this creek, within an hour's walk of the town of Lillooet, should have been passed by for a quarter of a century by hundreds, aye thousands of the best practical white miners and prospectors of the Pacific Coast, and now at this late date the prize falls into the hands of Chinese.'

"BRIDGE RIVER.—Discovered in 1858, and soon prospected nearly to its source and some mining done throughout. Coarse gold for ten miles up from mouth, further up generally scale gold. Some nuggets found in lower part of river of from one to seven ounces in weight, and one said to have been worth \$300. This stream was at first worked by whites, afterwards chiefly by Chinese and Indians. In 1866, Chinese said to have obtained gold to value of \$66,000 to twelve men, by wing-damming. A good deal of the mining has been done of late years on the South Fork, which is reached by a journey of three or four days from Lillooet via Seton Lake and across the mountains. Gold worth \$16.50 per ounce, coarse, nuggets worth \$10 to \$22 have been found.

"WILLIAMS CREEK (Cariboo District).—Discovered 1861, and has yielded more gold than any stream in British Columbia. As examples of the yield in early years, it may be stated that Steele's claim gave a maximum yield of 400 ounces, or \$6,524 a day. Over \$100,000 in all taken from this claim of eighty by twenty-five feet. In 1862, Cunningham's claim produced gold to the value of nearly \$2,000 a day for the season, while on several days as much as fifty-two pounds weight of gold was taken out. The Adams' claims yielded to each of its three partners \$40,000 clear. These claims were above 'the canon' in shallow ground. The deep ground below 'the canon' was first bottomed near the end of 1861 by the Barker Co. (whence Barkerville). The Diller Co. was the next successful in this, and it is credibly stated that here, on one occasion, 200 pounds of gold, worth \$38,400 was obtained in one day. In 1863, three claims below 'the canon' yielded \$300,000, and twenty claims were steadily producing from 70 to 400 ounces a day. Four hundred miners were at work on Williams Creek in this year—'the Golden year.' The aggregate of Williams Creek, for the first seven years of working, for which no returns are available, was very large. In 1888, about twelve hydraulic claims were being worked.

"LIGHTNING CREEK.—Discovered in 1861, and in that year \$200,000 worth of gold was taken from Campbell's Discovery claim, and the adjacent Whitehall claim. Attempts were made almost from the first to reach the deep channel of this creek, but after much work were abandoned in 1864. Sinking was, however, resumed in 1870, and, having proved successful, led to the subsequent great developments. The rich character of some of the ground on this creek may be illustrated by stating that at one time the Butcher claim yielded 350 ounces a day, the Aurora, 300 to 600 ounces, and the Caledonia 300 ounces.

"There are also quite a number of valleys in which, though the bed of the present stream has proved rich, the deep ground or old channel has not even yet been reached, or if reached, has not been satisfactorily tested. In all these cases it requires only more effective machinery and greater engineering skill to be brought to bear, to attain and work the deposits referred to, and it is likely that many of them will pay well when such means can be applied at a reasonable cost.

"Not the least important consideration, however, from the point of view of placer mining, is that of the probable existence of placer deposits differing in age and character from those which have so far been worked in the Province."