

Tudor and Brodie veins. Of nine shafts which have been sunk on the first of these veins, connected by a gallery of about 400 feet long, and have attained depths of from 100 to 250 feet, five have yielded mineral of great richness to considerable depths. That extracted from shaft No. 2, at a depth of 180 feet, gave over an ounce of gold to the ton. The quartz from all of these openings is extracted by underhand stoping; the plan of overhand stoping, at first adopted, having been quickly relinquished on account of the hardness of the rock. When we visited the property of Mr. Bürkner, all of the shafts on the Tudor vein were for the time abandoned, and of five on the Brodie vein, two only were being wrought, one at a depth of eighty, and one at thirty feet, which furnished eighty tons a month of quartz yielding 10 dw. of gold per ton; the whole cost of extraction and amalgamation not exceeding \$5.25, the working of these two shafts thus gave a monthly profit of \$400. Mr. Bürkner had also, at that time several trial pits on the South vein, about a quarter of a mile south of the Tudor vein, which had already given satisfactory results. This vein is observed, in its western prolongation, to turn towards the northwest, assuming a south-west dip, and will probably be found to join one of the veins on the north side of the anticlinal axis. Numerous other lodes have been observed in the Waverley district, some of them within, and others without the limits of the properties already mentioned, but they have not as yet, for the most part, assumed any special importance. The barrel quartz of Laidlaw's Hill, in the eastern part of the district, is, however, to be excepted. This has already been noticed, and its structure explained on page 7. It is apparently a quartz lode exposed on the crown of an anticlinal which runs a few degrees to the north of east. The corrugations generally present the form of wave-like undulations, rarely that of tight folds, and in one exposure, a little to the westward, the same, or another quartz lode, appeared as a nearly horizontal sheet. A shaft sunk about forty feet south of a point where the barrel quartz was found at a depth of twenty feet, failed to meet it at sixty feet, showing apparently a rapid southern dip of the lode on that side. A similar corrugated structure, to some extent, was observed in another lode farther west, which dipped about forty-five degrees to the southward. The barrel quartz is somewhat banded in its structure, and holds calcite in parts, apparently a subsequent deposit, filling fissures in the quartz. A similar case was observed in the highly laminated lode of barrel quartz from Upper Stewiacke, where both calcite and pyrites have evidently been deposited in irregular cross fissures in the lode. (See pages 8 and 9.)

In 1862 and 1863, this deposit was extensively mined, and offered great advantages from the facility and cheapness with which the quartz was extracted. Thus it appears, from the report of the Chief Commissioner of Mines for 1863, that during the last three months of 1862, the average product of each miner on the barrel quartz was nine tons a month, while in other localities it did not exceed two or three tons. Some portions of this quartz have been exceptionally rich. Thus a mass of about two cubic feet was extracted in 1862, from which gold to the value of \$4,500 was obtained, while the adjacent portions of quartz, for a considerable distance, proved to be quite barren. The average yield of the barrel quartz, in 1863, was said to be not over 5 dw. to the ton. The great loss of gold observed by Prof. Silliman, in the treatment of this quartz, has already been noticed on page 16. After having been abandoned over three years, the mining of the barrel quartz was resumed in 1866, by Mr. DeWolf. The previous workings had been by stripping off the overlying rock and quarrying the bed of quartz in the open air; but it is now extracted by means of narrow subterranean cuttings, the openings, after the removal of the auriferous quartz, being filled up with the waste rock. The ordinary thickness of the barrel quartz is from eight to twelve inches; but it is subject to considerable variations. Its ordinary yield in gold is said to be at present from 6 dw. to 10 dw. per ton; though rich specimens are occasionally met with. Mr. Bürkner, who has two areas of the barrel quartz, employed upon it, at the time of my visit, twelve miners, who got out 100 tons a month. The total cost of the extraction and treatment was \$4.50 the ton, which gave an average of 7 dw., giving thus a clear monthly gain of \$250.

We have already spoken of the stamp mill of Mr. Bürkner (page 15). It has twenty-four stamps, weighing 780 pounds each, with cast-iron heads. The lift of these is fifteen inches, and the number of strokes from fifty to sixty a minute. It is arranged with oscillating tables, and has for its motive power a water-fall, whose force is estimated at 120 horse-power. The total cost of this establishment has been \$20,000, but Mr. Bürkner