

on in another claim high up the eastern range, in a large landslip enclosing the reef, similar as in the case of the Nugget and Cornish.

The crushing stuff from these workings contains abundance of vein quartz, and is very ferruginous, resulting from decomposed pyrites, though the latter occurs also intact in pretty considerable quantity. The exact yield of the crushings was not given, but from what I could gather it does not amount to much above 5 dwts. of gold per ton.

The crushing plant of the Otago Company consists of sixteen heads of revolving stamps, in four batteries, fed by hand, and driven by a turbine at a speed of about 60 blows per minute; weight of stamps, 6 cwt.; lift, only 5 to 6 inches; gauge of gratings, which are punched, 122 holes per square inch. The arrangements for gold-saving for each battery are as follow:—The stuff passes in succession a shallow mercury ripple, two and a half feet of copper plate; two blanket-strakes, four feet long; a rather narrow mercury ripple, with a five-inch drop; and two blanket-strakes of six feet in length. Both the lower and upper strakes are two feet wide, and lie, in front of two batteries, at an inclination of one inch and a half per foot; in front of the other two, at one inch and a quarter per foot. The blanket-sand, which is very rich in pyrites, after being merely washed by tin-dish and in a strake, is left to decompose by exposure to the atmosphere, and is then passed again through one of the batteries, with gratings of 225 holes per square inch. Mr. Southberg knew that on account of the large quantity of pyrites much quicksilver was being floured and a great deal of fine gold lost, and he seemed inclined to adopt the Clunes system of appliances I recommended.

*Phoenix, late Scandinavian, Company.*—The ground of this company, also on Southberg's Reef, adjoins that of the Otago Company on the east, and, according to a plan and sections prepared by Mr. F. Evans, the consulting engineer of the company, has been extensively worked by and from several adits, driven from the steep slope of the range. As these workings were inaccessible, I could not examine them; but from what I learned from Mr. Evans, the reef, which averages in them eight feet in thickness, contains what appear like two large payable shoots (the yields varied from 6 to 25 dwts. of gold per ton), dipping eastward in strike, and there is besides the chance of the rich shoot coming from the Otago Company's ground, above mentioned. The quartz—and this is the case in the latter company's ground also—changes in character from crystalline and brown ferruginous in the higher to dense and bluish-grey in the lower parts of the workings—in fact, the latter quality represents a so-called "new," or "second make." On examination of specimens, I found it densely impregnated throughout (the cause of its dark colour) with extremely fine particles of pyrites (iron pyrites with much arsenical and copper pyrites), and showing gold in very fine specks. It looks in texture more brecciated than seamy. The reef will in future be worked by and from a new deep adit, which, at the advice of Mr. Evans, has been driven from Skipper's Creek, and struck the reef at a distance of 347 feet, from which level there would be about 160 feet height of backs available to rise upon. As regards the crushing machine of this company, erected about eight years ago, and at present much out of repair through long disuse, it is the largest in the province, and its system of gold-saving appliances resembles most closely that of the Port Phillip Company, Clunes. It consists of thirty heads of revolving stamps in six batteries, each of five heads, supplied with self-feeding hoppers and driven by a powerful turbine in the centre. The coffers are of the Clunes pattern; weight of stamps, over 6 cwt.; lift, 6 to 8 inches; gratings punched with 122 holes per square inch: at one time gratings of wire gauze were used, with only 81 holes per square inch. The stuff passes from each battery through three connected quicksilver troughs, with 8 inches drop, and supplied with splash-boards, and afterwards over blanket strakes of 14, 16, and 18 feet in length for different batteries; some with 1, others with 1½-inch fall per foot. The quicksilver troughs are rather narrow, and concave at the bottom, which is not as good as if they were flat, as the quicksilver is more liable to be splashed over in front. The stuff from the stamper-boxes is washed in a large tie. For the treatment of the blanket sand, which is very rich in pyrites, serve a large revolving barrel with a broad shaking table and rippled ties attached; and after passing these appliances, it is put aside to be ultimately ground with quicksilver in a large arrastra, for the purpose of extracting the gold from the pyrites. The yield of the sand by this latter process has varied from 3 to 12 oz. of gold per ton; loss of quicksilver not ascertained. There is also a reverberatory furnace built, after the old Cornish model, within the mill-house; but this has not been in action for the last six years, on account of the fumes being unbearable and dangerous to the men working in the building. According to what Mr. Evans told me, he understands the process of the extraction of the gold from the pyrites well, and intends to build and work another furnace after the Victorian model, outside the mill. Besides this, he purposes erecting in front of the batteries several Borlase's buddles, to insure a more satisfactory saving of the pyrites. With these contemplated improvements executed—considering the capabilities of the mine, as stated by Mr. Evans—it ought to rank soon amongst the dividend-paying ones of the province, more especially if the occasional short supply of water for the crushing works is obviated by the construction of the proposed new race. There have been a number of other claims and reefs worked in the district, of which Mr. Evans kindly gave me the following particulars:

*British American Claim.*—It lies on Southberg's Reef 600 feet east, up the range. The reef, being there 3 to 4 feet thick, was opened by a shaft, and the stuff obtained paid 11½ dwts. of gold per ton. The party then drove an adit to strike the reef about the site of the shaft; but having had no survey for guidance, went nearly 300 feet out of the line, and never reached the reef. There has been nothing done since in the claim. Between 300 to 400 tons of stone were crushed by the machine of the Nugget and Cornish Company, which once belonged to the party.

*Prince of Wales Reef* is a continuance of Southberg's Reef, westward, high up the range. It was from 15 to 20 feet thick where opened, and paid from 7 dwts. up to 1 oz. of gold per ton; but the stone crushed was mostly picked.

*Pactolus Reef.*—It lies north of the Prince of Wales Reef, is about 6 feet thick, and has a north and south strike. The prospectors opened it for 20 feet in length, and had a trial crushing which yielded at the rate of 6 dwts. of gold per ton. As this did not pay for working, it was abandoned, and has not been further tried.

*Sawyer's Gully Reef.*—It was 3 to 4 feet thick on the surface, but pinched in depth. Three tons were crushed, which yielded 4 oz. 12 dwts. of gold. There has been nothing done on it since.