

vacuum and solution pumps. This machine, which has given great satisfaction on the New Zealand and Mexican goldfields, consists of a deep cylindrical-shaped vat, with a large pipe running up the centre, and it is by this means that agitation is carried out by the aid of air forced into the residues, no other power being required to operate it. This vacuum, applied as it is, causes the whole of the charge to boil up, in appearance similar to the more active of the boiling-mud pools in the thermal districts of this Dominion. A specially written paper on this efficient agitator, kindly contributed by the inventor and patentee, Mr. F. C. Brown, superintendent of the Waihi Grand Junction Mine, appears in Appendix E. The total extraction obtained at the Waihi Mine was, according to assay, 89 per cent. of the gold and 70·3 per cent. of the silver contents. During the year a settlement occurred on the hanging-wall side of the Martha vein above No. 5 level, but beyond the destruction of a small section of old timbering no damage was done, the old levels and depleted stopes having previously been almost completely packed to the surface. Subsidence of this nature may be expected after removing such large masses of solid vein-matter and replacing the same with mullock or any other packing, for, however carefully packing may be constructed, such stability as that given by the original vein-filling cannot be attained; moreover, the exploitation of the ramified veins at Waihi tends to partially detach large and weighty masses of country rock from the original formation. Every precaution that engineering skill can devise is being taken to secure this mine from injury by subsidences, and no fear need be entertained that these precautions will not be successful.

Waihi Grand Junction Mine: The opening-up of this mine has proceeded with very fair results, and there can now be no doubt but that the Waihi vein system exists in the north-west area of the property, and will be further developed as depth is attained; but as the mine is drained to a considerable extent by the pumps at the adjoining Waihi Mine, its development at depth is at present controlled by that company's unwatering operations. During the year the principal developments have been concentrated on the Nos. 2, 3, and 4 levels, at depths respectively of 500 ft., 636 ft., and 794 ft., and the whole of the milling-ore has been obtained from the Martha and No. 2 veins; but with the attainment of depth, on the evidence of discoveries which have been made during the early part of 1908, other veins will shortly contribute to the output, and with this end in view the main shaft is now being deepened to the No. 5 level. The reduction plant, which is electrically driven, is otherwise very similar in character to that employed at the Waihi Mine, and the process of treatment is almost identical.

The Talisman Consolidated (Limited) Mine is now the leading bullion-producing mine on the Karangahake Goldfield, and ranks second only to the Waihi Mine in this Dominion. A plan and section of this mine which accompany this report will serve to illustrate the magnitude of mining operations, and the engineering skill by which several small mines, which formerly were unsuccessfully worked as separate concerns, have now been consolidated and worked most profitably as one mine. The foregoing statistical tables show that during the past year there has been a substantial increase in production and value per ton of ore treated, likewise in dividends paid by this company. The feature of the year has been the exceptional richness of the ore in the lowest levels: at levels Nos. 11 and 12, Bonanza section, the rich sulphide-ore chute has been proved to extend much further southward than in the upper levels, where from a seam 2 in. or 3 in. in width it has strengthened rapidly in width and values; and in the No. 12 level it has been driven along for some hundreds of feet; at the No. 13 level, at a vertical depth of 1,700 ft. from the apex of the vein, this ore-shoot continues to be of exceptional richness, and a considerable quantity of it has been exported for special treatment on account of its refractory character. To enable the management to handle the increasing output from this mine, additional installations are being made to the power and treatment plant.

Waiotahi Mine, Thames Goldfield: Owing to the practical exhaustion of the "bonanza" which was discovered between the 4th and 5th levels towards the end of 1904, and from which ore approaching in value £400,000 has since been won, there has been a decline in gold-production and dividends paid during 1907, but this mine still produces profitable milling-ore of lower grade, and will continue to appear among the dividend-paying mines. The principal developments during the year have been devoted to the No. 6 level (500 ft.), and from thence a winze was sunk 80 ft. to the water-level, but as yet nothing of importance has been disclosed. The deep-sinking and unwatering operations at present being carried out at the adjacent Queen of Beauty shaft to the 1,000 ft. level will be of considerable benefit to this property by enabling continued development to the aforesaid depth.

West Coast Inspection District.

There has to be recorded a slight decline of £9,396 in the value of the gold-production during the year from the Reefton goldfield, but developments have been satisfactory, and it is probable that an improvement will occur during 1908.

The operations of the Progress Mines (Limited) continue to be very satisfactory, as proved by the regularity of the dividends, the sum of £34,375 having been so declared annually for the past three years. The most important feature at this mine during the year was the successful development of profitable ore-bodies on the Nos. 9 and 11 levels. On the latter (1,450 ft.) a vein of considerable value was proved for 140 ft. in length, and a quantity of high-grade ore was obtained from it.

The mines of the Consolidated Goldfields (Limited) have improved their position by an increase both in the quantity of ore treated and the value of the production. At the Wealth of Nations Mine developments were concentrated on the Nos. 8 and 10 levels, at the former of which a valuable but irregular and narrow block of ore was disclosed. The quartz mined was taken almost exclusively from the main reef on the Nos. 7 and 8 levels. At the Golden Fleece Mine, also the property of this com-