

# Mining in New Zealand.

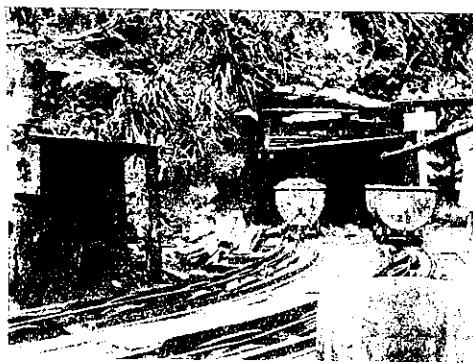
## The Denniston Collieries.

(By G. L. Hereus, A.O.S.M.)

Westport Coal is a household word throughout the Dominion, and a short description of the premier mines of the New Zealand field might be of interest to readers of PROGRESS.

The Denniston Coal Field lies at the top of a bare plateau, about 1800ft. above sea level, and is situated about 14 miles from the town of Westport. The Westport Coal Company's Denniston leases comprise an area of 2500 acres, lying between the head waters of the Wareatea and the Waimangaroa rivers, and these leases are worked as two distinct mines, viz., the Coalbrookdale Mine and the Ironbridge Mine, both working in the Coalbrookdale seam. The output from this field has risen from 35,000 tons in 1883, to 347,719 tons in 1910.

**GEOLOGY.**—The Denniston field is evidently an upthrow from the measures nearer the coast line. It is traversed by



ENTRANCE COALBROOKDALE MINE.

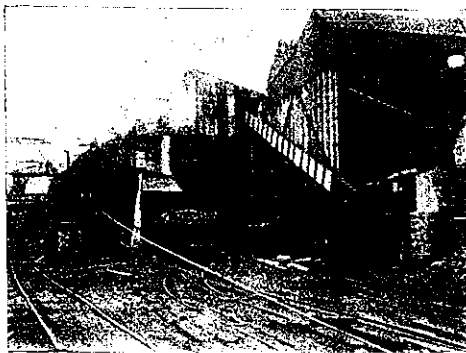
several big faults running parallel with the coast line. The age of the coal measures is generally considered lower Eocene. The typical succession of strata of the Buller Coalfield is—

1. Black slaty clays.
2. Brown and grey sandstones.
3. Grits and sandstones with seams of coals.
4. Coarse grits and conglomerates.
5. Gneiss or granite.

but in the Denniston field the clays are absent.

**HAULAGE.**—The great height of the plateau above the level of the railway, and the abruptness of the rise below, naturally afforded a pretty difficult problem in the way of haulage. This has been solved by the construction of an incline from the crest of the plateau where the bins, etc., are situated, to the valley of the Waimangaroa River below at Conn's Creek, from whence a short line of private railway connects with the Government Railway at Waimangaroa Junction, ten miles from Westport. This incline presents a very pretty piece of engineering, and is worked in two sections on the three-rail jig principle. The gauge is the standard Government railway gauge, and railway trucks carrying eight tons each are run down. The lower jig is 50 chains long, with a fall of 864 feet and a maximum grade of

1 in 2 1/5, and is controlled by hydraulic brakes on the cataract principle with two cylinders 13in diameter, with 3in. stroke, operating on a 10ft. 3in. drum. The upper jig is 33 chains long, with a fall of 834 feet, with a maximum grade of 1 in 1 1/3,



BINS AND HEAD OF INCLINE, DENNISTON.

and is controlled by a similar brake operating on a 9ft. diam. drum.

**BINS AND SHOPS.**—The town of Denniston is situated on the crest of the Mount Rochfort plateau, as also are the screening plans, bins, fitting shops, offices, etc. The bins have a storage capacity of 2000 tons steam coal, 700 tons slack, and 500 tons unscreened coal, and are completely fitted with up-to-date screening and picking tables. At the shops, all the light repairs are carried out, and the steel mine tubs constructed. The Company intend extending these shops, and also installing a foundry to do their own light castings. The power for driving all machinery, and also for lighting the works and township of Denniston, is derived from four 120 h.p. Babcock and Wilcox boilers, which supply steam to the different units. Owing to the increased demand for power, two addi-



ENTRANCE WAREATEA SECTION, COALBROOKDALE, WITH COAL OUTCROP.

tional boilers of the same type are to be added.

**SUBSIDIARY HAULAGE.**—The surface haulage from the bins to the mines is all on the endless rope principle, divided into two units. The first, three-quarters of a mile long, connects with the Ironbridge underground system, and to the second unit at Ironbridge. It is operated by a 200 i.h.p. engine, geared 7 to 1, working at the Denniston end. The roads are laid on a 2 feet gauge, carrying steel trucks with

a capacity of 11ewt. of coal each. This endless rope has a capacity of about 270 tons per hour. The second unit is about a mile long, and is worked by a compound engine, 12in. by 14in. diameter, working at the Coalbrookdale end. The Ironbridge underground haulage, 74 chains long, is operated by a compound Archer engine, 10in. by 16in. diam. working at 120lbs., and connects through an incline, directly with the horse roads and underground jigs, while the Coalbrookdale underground haulage is 55 chains long, operated by a vertical compound Tangye engine, 8in. by 9in., at 120lbs. pressure, and connects with the underground horse roads and jigs in the Coalbrookdale Mine.

**VENTILATION.**—The ventilation of the Ironbridge Mine is effected by means of two 7-foot Schiele fans, each driven by a 35 h.p. engine, and supplemented by two Roots blowers. The Coalbrookdale Mine is ventilated by means of a Hayes Fan, designed to give 150,000 cubic feet per minute, driven by a 40 h.p. engine. Gen-



ENTRANCE IRONBRIDGE MINE.

erally speaking, the ventilation of the Denniston Mines is perfect.

**METHOD OF MINING.**—Both the mines are worked on the bord and pillar system, with pillars generally 22 yards square, except where excessive roof pressure demands a larger pillar. The headings are driven 9 feet wide, and the bords six yards. The system of pillar extraction is of interest. The pillars are split by a well-timbered heading, six to nine feet wide. When this split is through, the top coal on either side is shot away, and the place gradually worked back. In this way the coal runs down to the men who are practically always under cover, the coal thus being left without any support, and worked up to 17 feet high. There has been some criticism as regards to this method; as, to one not thoroughly conversant with the conditions, it looks unsafe, but the best index of its safety lies in the comparative absence of accidents in pillar workings, and also the fact that the miners in the State Colliery at Point Elizabeth are themselves agitating for this system to be adopted there. All the actual coal cutting is now done by hand. The management installed electric coal cutters, but these proved unsatisfactory, and compressed air pick machines were installed. It has, however, been found that the economic margin is in