

first instance, and the headings are being pushed ahead to the boundaries. The fireclay roof of the coal-seam has been safely supported with timber systematically spaced and set throughout the roadways. An average output of 20 tons per day is conveyed to the Hikurangi Railway-yards.

*Northern Co-operative Colliery (Cunningham's Crown Lease).*—The available coal on this lease is almost exhausted, and there are only a few pillars of inferior coal near the entrance to the drive remaining for extraction. Surface boreholes put down during the year have not revealed further areas of workable coal.

*Glen Nell Colliery (Crown Lease).*—The seam is only 2 ft. 3 in. in thickness, and occurs at a shallow depth. It is overlain by a stony hard roof, which affords a safe cover for the workmen. Wide places are worked in reduction of the coal pillars, a few remaining for extraction. A new drive is projected for winning the rise coal.

*Hillside Colliery (Cummings and Party).*—A small colliery was opened up by a co-operative party on an isolated portion of the property of the Hikurangi Coal Co., Ltd., under contract and lease from the company. The area was much troubled by faults, and extraction of coal was confined to a rise area in close proximity to the main-rise heading. Shallow boreholes are being put down by the party on an adjacent property. The output is carted to Hikurangi Station, a distance of two miles.]

*Belton's Colliery (Freehold).*—The mine is situated on freehold land adjoining the Hikurangi Valley Road. Operations have been limited to the removal of a strip of coal abandoned by the Hikurangi Coal Co., Ltd., some years ago. Four miners have been employed during the year, and generally the mine has been well managed. The party operating the mine pays a royalty of 3s. 3d. per ton to the owner of the freehold section, and the output of approximately 20 tons per day has been removed by means of motor-lorries over the Town Board's Valley Road to the Hikurangi Railway-yards. The road is in a bad state of repair, and neither the miners nor the owner contributes toward its upkeep.

*Kuatangata Colliery (Freehold).*—During the year mining operations were suspended for four months pending the settlement of a dispute between the owners and a co-operative party in respect to the terms and boundaries of the lease. A Sirocco fan electrically driven has been installed in the return-airway shaft, resulting in a marked improvement of the ventilation of the mine-workings. A seam of fireclay 4 ft. in thickness has split the seam into two separate seams, 4 ft. and 7 ft. respectively, and it has been found more practicable to work off the top seam before opening out extensively in the bottom seam.

*Harrison's Waro Colliery, Whangarei (Freehold).*—This colliery was recently acquired by the British Standard Cement Co., Ltd. Boring operations have been conducted on the property in order to prove the existence of the seam eastward of the existing shafts. The branch railway to the mine, which has not been in use for several years, is being repaired and reconditioned for a train service to the mine. New pumping machinery is being installed underground, and generally the mine-workings are being extended to produce sufficient fuel for the company's cement-works when they are erected at Whangarei Heads.

*Ngunguru Fireclay and Coal Co., Ltd. (Fireclay-mine, Kiripaka).*—The company exposed an elevated outcrop of fireclay 10 ft. in thickness, intermixed with bands of stone and shale. A loading-bank for motor-lorries has been constructed in close proximity to the main county road within a quarter of a mile of Kiripaka Post-office. The fireclay is jiggled down a steep surface tramway to the loading-bank. Three large motor-lorries have been acquired for the purpose of conveying the output to Whangarei Harbour, a distance of ten miles. The clay is then shipped by sea to Auckland.

*Rotowaro Colliery.*—The workings of the company's three mine sections have been advanced, with encouraging results. In No. 1 mine section the pillars have been withdrawn, within the limits of the sectional barriers, to the roadways of the new engine section and the east section. The main endless haulage-rope has been extended beyond the pillared sections, and two new bord sections have been opened out on the east side of the mine. Several incipient fires have been detected and suppressed in their early stages, and the affected areas have been isolated by brick stoppings. A workable seam of coal has been proved by No. 3 dip heading to extend toward the west of the proved troubled area. The available air-current is judiciously divided into four separate splits, thus ensuring a fresh supply of air to each working-section. An additional pumping unit has been installed in order to cope with the increasing inflow of winter months. The electric transmission-cables have been carried over the surface to connect by boreholes at selected points with the motors and other apparatus underground. Sampling and testing of the mine-dust has been conducted in accordance with the regulations, and the roadways have been liberally treated with stone-dust, as evidenced by the whiteness of the walls and by the recorded analyses.

In No. 2 mine section the workings are confined to the lower seam. The seam is highly inclined, making the conditions rather difficult for face-work. Contour headings have been driven to provide access to the rise pillar coal. Marked progress has been made in the development of No. 3 mine (bottom seam). In addition to winning an output by machine mining, the main headings have advanced 20 chains through a disturbed seam containing numerous faults and drift stone. An extensive area of thick coal has been proved ahead by boring, and the main headings should soon provide room for the production of coal on a large scale. Surface developments in progress include the installation of another electrical generating unit, a 500 h.p. steam boiler, and reconditioned mine-workshops affording facilities for conducting all repairs to the plant and machinery.

*Pukemiro Collieries.*—An output of 149,272 tons was obtained from two separate mine sections, named the north and south. In the north mine section the pillars are being successfully removed from three branch sections. A high percentage of pillar coal is obtained by the method employed to remove the pillars. The roofs of the roadways surrounding the pillars are supported by additional rows of props set to prevent any roof-movement while the successive splits and slices are worked off the pillars. When the supports are efficient it is often possible to remove entirely all the coal in the pillar, and in coming back when the props are drawn off—a few at a time—much of the fallen top coal is recovered before the roof stone eventually falls. The driving of headings from the north-west section and from the Glen Afton side of the colliery to connect the brickyard section is proceeding, both headings being driven through the stone underlying the seam. In the south mine section the headings and bords of the first working of the seam are approaching the proved faults and boundaries. The pillars are intact and should be in a good state of preservation, as they have been enclosed within the rings of stoppings erected to seal off the panels of the first workings. The main south heading is standing on a fault of considerable displacement, and boreholes are being drilled from the surface at intervals to prove the depth of the disturbance of the strata. The roadways in both mines have been liberally treated with incombustible dust. The roadways and mine equipment have been maintained in good condition. The ventilation has been effective and adequate throughout the mine-workings. In the east section the seam was followed to the surface through an intervening gully to a higher outcrop, and preparations are now being made to grade the roadway for endless-rope haulage. A total of 280 persons was employed in and about the colliery in connection with the operation of the mine. Out of that number coal-miners averaged 110, and the daily average output of coal per miner was 6.9 tons.

*Glen Afton Collieries.*—This well-established colliery produced an output of 176,254 tons during the year. Headings of considerable length have been driven ahead of bord requirements for the formation of panels and barriers, and mine-development generally has been maintained in advance of possible output requirements. Eleven mine sections, known locally as A, B, C, D, E, F, G, H, I, J, and K, have been opened out, and six of the sections—namely, A, E, F, I, J, and K—are producing coal in required quantities. The other sections have been sealed off by stoppings at the entrances in order to isolate the old workings, and to arrest the loss of carbon by oxidation, which is considerable in mines of variable temperatures. The most important developments comprise the recovery of the seam through the 70 ft. upthrow fault, the formation of new bord sections beyond the fault-line, and the extension of the subsidiary haulage plant in E section to the inbye connected H section. A section continues to produce a high percentage of pillar coal under excellent pillaring conditions. The main headings in E section have reached the line of the thin coal area which is converging toward the workings of H section. The average temperature of the mine as recorded by hygrometric observations is 64° wet bulb, 66° dry bulb. A