

1919.

NEW ZEALAND.

THE COAL INDUSTRY.

REPORT OF THE BOARD OF TRADE.

Presented to both Houses of the General Assembly by Command of His Excellency.

To the Hon. W. D. S. MacDonald, Acting President of the Board of Trade.

INTRODUCTION.

SIR,—

1. On the 10th September last the appointed members of the Board, together with James Hight, Esquire, M.A., Litt.D., of Christchurch, were authorized and empowered, by Warrant issued by His Excellency the Governor-General under section 6 of the Cost of Living Act, 1915, to inquire into and report upon the following matters :—

- (1.) The present cost of the production and distribution of coal in New Zealand.
- (2.) Any increases in the cost of such production or distribution since the commencement of the present war, and the causes of such increases.
- (3.) Whether the profits made in the production and distribution of coal are fair and reasonable.
- (4.) Whether the selling-prices of coal are fair and reasonable.
- (5.) Whether increased economy or efficiency can be obtained in the production and distribution of coal, and, if so, in what respects and in what manner.
- (6.) All other matters affecting the supply or price of coal.
- (7.) The increases since the commencement of the present war in the cost of living so far as such increases affect men engaged in the production of coal, distinguishing between increases, if any, prior to and subsequent to the industrial agreements made in the coal industry in the year 1917.
- (8.) The increases since the commencement of the present war in the earnings of men engaged in the production of coal, distinguishing between increases, if any, prior to and subsequent to the said industrial agreements.

2. The Board held sittings at Auckland, Huntly, Glen Massey, Wellington, Christchurch, Dunedin, Invercargill, Nightcaps, Kaitangata, Greymouth, Runanga, Blackball, Westport, Denniston, Millerton, and Ngakawau, and heard evidence from 112 witnesses, comprising coal-mine owners, managers and secretaries of coal companies, mine-managers, coal-merchants, dealers, and mine workers. Considerable evidence was also taken regarding the cost-of-living side of the inquiry from storekeepers and other tradesmen in the mining districts relative to changes in prices of commodities. An analysis of the occupations of witnesses is as follows: Mine-owners, managers and secretaries of coal companies, 16; mine-managers, 13; miners and mine workers, 22; wholesale and retail distributors, 31; storekeepers, &c., 22; other witnesses, 8.

3. The evidence of witnesses was taken mainly *in camera*. The Board felt that as it had to deal with matters of a highly confidential nature this was the best course to adopt. The result has amply justified the step, as witnesses answered all questions fully and frankly, and the Board would like to place on record its appreciation of the material assistance given.

4. After consultation with you it was decided not to print the evidence, mainly on account of its confidential nature.

5. At the request of the workers' representatives the Board inspected the working-places and labour conditions generally in the following mines: Taupiri, Rotowaro, Pukemiro, Waipa, Night-caps, Kaitangata, Point Elizabeth, Blackball, Denniston, and Millerton.

6. The housing-accommodation of mine workers was also inspected generally by the members of the Board in the coal-mining districts visited, but as a detailed inspection was deemed necessary the Board appointed Mr. S. Hurst Seager, architect, of Christchurch, to make a special inspection. The result of this is dealt with later in this report.

The mass of data accumulated in the inquiry was enormous and concerned every detail of the producing and distributing industries. The selection of facts and the generalizations necessary to answer the questions of the order of reference have been arranged, according to logical division of subjects, in the eight chapters of the report.

The first chapter is a brief summary or survey of the chief outstanding features of the coal industry of the Dominion, providing certain information necessary for those with no special technical knowledge of the industry who would make use of the body of the report, and stating a few general principles that should assist in its interpretation—in general depicting the background and atmosphere of the main subject. The second chapter examines and analyses the costs of mining coal, and traces and endeavours to account for the changes in these during the period under review—viz., since 1913-14. The third does the same in respect of the distribution of coal. In the fourth an attempt is made to assess the profits that have been made in the coal business, both mining and dealing, and to interpret their changes. A similar problem in regard to the earnings of mine workers is attacked in Chapter V, whilst the succeeding chapters, VI and VII, are devoted to similar treatments of the cost-of-living and housing and general social conditions on the mining fields. The final chapter discusses the possibility of improvement at all points in the industry and embodies the chief recommendations of the Board.

In order to facilitate reference to the more important findings and recommendations of the report there is included in Chapter VIII an abstract or synopsis, divided according to the numbered subjects in the order of reference. A short index and a contents summary are also attached. The most important findings of the inquiry are distinguished in the body of the report by means of italic type.

NOTE.—In all places where the information given was confidential, mines or companies are indicated not by name but by letter or number. Each mine or company is not indicated by the same letter or number throughout the report—i.e., in one context "A" may indicate a particular mine and in another context a different mine.

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CHAPTER I.

GENERAL SURVEY OF THE COAL INDUSTRY IN NEW ZEALAND.

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1. COAL RESOURCES, OUTPUT, AND CONSUMPTION.

DURING the process of its investigations the Board visited the chief coal-mining fields of the Dominion. These fields are widely distributed in well-defined areas.

(i.) CHIEF COALFIELDS.

(1.) *The North Auckland Field.*—The chief mines producing at present are those of the Hikurangi Coal Company (Limited), and the Northern Coal Company (Limited), near Whangarei. The coal is of good quality, and is largely used for steam-raising purposes, for which it is well adapted. The coal from this field is usually classed as pitch, glance, or semi-bituminous.

(2.) *The Waikato Field.*—The chief mines are those of the Taupiri Coal-mines (Limited), the Pukemiro Collieries (Limited), and the Waipa Railway and Collieries (Limited), producing brown coal, near Huntly and Ngaruawahia.

(3.) *The West Coast Fields.*—These fields are developed mainly in the Grey Valley, the Paparoa Range, and the districts between Westport, Mokihiui, and Karamea. The coals are chiefly bituminous, though there are also valuable seams of semi-anthracite in the Paparoa Range. The chief mines now worked are those of the Westport Coal Company (Limited), the Blackball Coal Company (Limited), the Westport-Stockton Coal Company (Limited), The Tyneside Proprietary (Limited), the Paparoa Coal-mining Company (Limited), (in liquidation), and the State Mines near Greymouth. On the Inangahua Coalfield, extending from the Buller River to Reefton, there are a few minor collieries producing a superior pitch-coal.

(4.) *Canterbury.*—There are a few comparatively small mines producing brown coal in the western foothills, the chief being that of the Homebush Brick and Coal Company (Limited), and the newly opened mine of the Mount Torlesse Collieries (Limited) at Avoca on the Midland line. Isolated deposits of anthracite are found in the Malvern Hills.

(5.) *The Kaitangata Field.*—This field contains a superior type of brown coal, as well as lignites, the chief mines being those of the New Zealand Coal and Oil Company (Limited) and the Taratu Coal-mines (Limited).

(6.) *Nightcaps*, about forty-five miles from Invercargill, producing a superior brown coal and lignites. The chief mine is that of the Nightcaps Coal Company (Limited).

(7.) *Central Otago and Southland*, where there are numerous small mines producing lignites.

The mines in the Mokau, North-west Nelson, and North-east Otago districts were not made the objects of special investigation, since they are as yet comparatively unimportant or present no features of peculiar interest.

(ii.) CLASSIFICATION OF THE COALS.

The coals mined in New Zealand are extremely varied in character and quality. A common classification is into hydrous and anhydrous coals, the former containing a high percentage of water in chemical combination, the latter a very small percentage. These classes may be further subdivided into five clearly marked kinds :—

(1.) *Anthracite* coal, which is anhydrous, contains a very high percentage of fixed carbon (over 85 per cent.), and is non-coking. Patches exist in Canterbury, in the Paparoa Range near Greymouth, and near Charleston. As yet the supply is of very little economic importance.

(2.) *Bituminous* coal, anhydrous (containing usually under 5 per cent. of water). "The only point in which, as a class, these coals are different in any of the characteristics which are laid down as requisite for a perfect steam-fuel is in the solidity and toughness which enable the coal to withstand the constant attrition it must experience from frequent handling. This defect is, however, comparatively insignificant, and is more than compensated for (except in a few instances) by the purity of the coal, its tendency to cake, and the facility with which complete combustion can be

effected, so that the loss by the formation of cinders will be much below the average.” (P. Galvin, in “New Zealand Mining Handbook,” p. 381.) The chief sources of supply are on the west coast of the South Island.

(3.) *Semi-bituminous*, or pitch-coal, friable, containing from 5 to 10 per cent of water, and forming a soft coke. The coals of this class show some variety; the pitch-coals are glossy and clean, and contain more water than the glance-coals. Semi-bituminous coals are used largely for steam-raising, and are mined chiefly at North Auckland, North-west Nelson, Reefton, and in parts of the Grey district.

(4.) *Brown* coal, containing from 10 to 20 per cent. of water, forming no coke during combustion, and desiccating rapidly on exposure to the air. The chief sources of supply are the Waikato, Kaitangata, and Nightcaps districts, with some localities in Canterbury and North-east Otago.

(5.) *Lignite*, an inferior coal with a high percentage of water (over 20 per cent.), a clearly marked woody structure, and light weight in proportion to its bulk. The chief lignite-mines are in Canterbury, Otago, and Southland, where in many cases the deposits are practically quarried and thus easily made available for local consumption.

Friability in the case of the bituminous and semi-bituminous coals, and rapid desiccation and disintegration upon exposure to the atmosphere, are general qualities of New Zealand coals which have an important bearing upon methods of mining, upon the problems of the storage and the transport of coal to the consumer, and upon the percentage of the total amount mined or of the total calorific value of the coal as it leaves the working-places that is really available for his use.

The classification of our coals is, of course, based mainly on differences in their chemical composition. These differences entail differences in calorific or heating power and evaporative power. The following proximate analyses of representative coal-samples are taken from a table prepared by Dr. MacLaurin, Dominion Analyst, of results obtained in his laboratories.

TABLE 1.—ANALYSIS OF NEW ZEALAND COALS, WITH SIMILAR ANALYSIS OF CERTAIN FOREIGN COALS FOR COMPARISON.

Description of Coal.	Locality.	Analysis.						Calorific Value.	Evaporative Power as determined by Calorimeter.	Evaporative Power.
		Fixed Carbon.	Volatile Matter.	Water.	Ash.	Total Sulphur.	Per-centage of Coke.			
Anthracite ..	Paparoa Coal Company (No. 1 seam)	78.90	16.93	0.40	3.77	0.37	82.67	8439	15.74	9.44
Bituminous ..	Paparoa (best) ..	62.90	33.53	0.67	2.90	0.33	65.80	8443	15.75	9.45
..	Mine Creek, Millerton Colliery (east) ..	57.67	41.14	0.91	0.28	4.62	57.95	8227	15.35	9.21
..	Coalbrookdale, Munsie's Section ..	55.73	40.08	2.37	1.82	0.55	57.55	7923	14.78	8.87
..	State Coal-mines, Point Elizabeth (best)	56.07	40.58	0.60	2.75	0.49	58.82	8213	15.32	9.19
..	State Coal-mines, Point Elizabeth (household)	48.70	41.52	8.36	1.42	0.82	50.12	7143	13.33	8.00
..	Tyneside Mine, Brunnerton ..	56.57	37.22	0.46	5.75	2.67	62.32	8064	15.05	9.03
..	Blackball Mine (lower seam) ..	46.67	48.66	3.52	1.15	4.70	47.82	7541	14.07	8.44
Glance ..	Puponga (west workings) ..	49.28	41.51	4.94	4.27	0.42	53.55	6921	12.91	7.75
..	Hikurangi Coal Company ..	44.56	47.17	4.06	4.21	5.81	48.77	6810	12.71	7.63
..	Northern Collieries, Kiripaka (Ngunuru)	43.08	44.79	4.65	7.48	1.03	50.56	6581	12.28	7.37
Brown ..	Taupiri, Taupiri Extended ..	43.73	42.12	11.72	2.43	0.32	..	6129	11.44	6.86
..	Nightcaps, Southland (new workings)	41.20	38.72	17.56	2.52	0.28	..	5737	10.70	6.42
..	Kaitangata ..	38.00	39.96	18.22	3.82	0.40	..	5553	10.36	6.22
..	Homebush, Canterbury ..	31.83	41.82	23.15	3.20	0.41	..	4953	9.24	5.54
Lignite ..	Bannockburn, Cromwell, Central Otago	23.75	43.83	26.12	6.30	0.32	..	4291	8.00	4.80
..	Mataura, Southland ..	19.01	40.77	35.65	4.57	0.31	..	3789	7.07	4.24
For Comparison.										
Anthracite*	Wales ..	89.07	6.51	2.27	2.15	0.86	..	8220	15.34	9.20
Bituminous ..	Sydney, Nova Scotia, Canada ..	60.70	34.93	2.62	1.75	0.41	62.45	8120	15.15	9.09
..	Aberdare Collieries ..	52.55	41.59	2.46	3.40	0.55	55.95	7900	14.74	8.84

* These samples were taken from coal that had been in store several months, and anthracite is said to deteriorate on keeping.

(iii.) SOME GEOLOGICAL FEATURES.

Geological facts, besides in some degree accounting for the chemical composition of the coals, control the amount contained in a given area and the methods of mining the coal. In the first place the seams of coal vary in thickness over a large range. Seams of about 30 ft. are not infrequent, and some of the lignite-seams run to 80 ft., whilst one of 100 ft. is on record; but the character of the strata immediately overlying is often such that a great deal of the coal has to be left *in situ* on working, in order to guard against subsidence. The hardness of the coal, too, often varies much in the same seam, and in many cases stone and dross render mining more difficult and reduce the value of the coal. In the next place, the coal deposits are marginal (see Park, “Geology of New Zealand,” pp. 281-4), which helps to explain the great variability in thickness. The coal thins out wherever the basement rock rises in ridges, and it thickens in the basins; this is a very noticeable feature of the coalfields of New Zealand. Denudation has in some districts worn away great amounts of the coal. “In no New Zealand coalfield are the effects of marginal thinning of the coal-seams and of denudation more apparent than in the Buller-Mokihinui district. Owing to these causes the workable area is not more than one-tenth of that originally occupied by the coal-measures. Again, owing to the great thickness of the seams in places and to other causes a very large percentage of the coal is lost, and it is doubtful whether the extraction reaches 33 per cent. Moreover, considerable areas are left

unworked owing to the friability of the coal.” (Morgan, “Coal Resources of New Zealand,” 1913, p. 19.) Much of the coal has been subjected to irregular folding and exhibits frequent faults.

(iv.) AMOUNT OF COAL RESOURCES.

The amount of coal available for mining in the Dominion has been estimated by different authorities at various times. Professor Park estimates the total quantity of available coal at about 1,100,000,000 tons, after making the necessary deductions for losses due to faults, disturbances, and mining. This total is made up of—Bituminous, 254,500,000 tons; pitch-coal, 306,700,000 tons; brown coal, 520,889,000 tons.

Mr. P. G. Morgan, reviewing the available data (Coal Resources, p. 5), estimates the total of coal proved to exist at 1,001,000,000 tons, and the probable coal at 2,385,000,000 tons.

TABLE 2.—ESTIMATE OF COAL IN NEW ZEALAND (MORGAN).

Class of Coal.					Proved (Million Tons).	Probable (Million Tons).	Possible.
Anthracite	..	..	..	..	Very little	Very little	Small.
Bituminous	..	..	..	..	374*	477*	Moderate.
Semi-bituminous	..	..	..	..	114	341	Moderate.
Brown coal	..	..	..	..	234½	728	Large.
Lignites	..	..	..	..	278½	839	Large.

* “These quantities rest to some extent on over-optimistic assumptions, and ought to be reduced rather than increased, especially in view of the fact that much of the coal is unmineable.” (Bulletin, No. 17, p. 43.)

No allowance has been made for loss in mining. “It is quite safe to say that not one-fourth of the coal in the ground is being mined under present methods. Even in the bituminous fields probably two-thirds of the coal in the areas actually being worked is not extracted, to say nothing of areas left unworked, owing to the coal being too friable to command an adequate market price” (p. 9). Within the seams actually mined in an area it is possible to win as much as 85 or 90 per cent. of the coal, as at Westport and Point Elizabeth, but that percentage does not represent the proportion mined over the whole lease, and in some cases even this percentage may be a very low figure, as low as 15 per cent.

Careful estimates of the amount of coal in the two most valuable fields—viz., the Grey field and the Westport field—have been made by the Geological Survey under the direction of Mr. P. G. Morgan. “The Grey Coalfield is estimated to contain 636,000,000 tons of coal, of which about 6,000,000 tons have already been mined, and a further 10,000,000 tons at least left as irrecoverable in worked areas. Of the remaining 620,000,000 tons, about one-fourth, or 150,000,000 tons, may be mined, provided that conditions as favourable as can reasonably be expected prevail in future. Under almost ideal future conditions possibly one-half, or 300,000,000 tons, may be recovered. These estimates assume that crushed coal will be profitably utilized in the future. The low possible percentage of profitable extraction is due mainly to faulting and irregular folding. The estimate of the quantity of coal in the ground, and of the amount that can be profitably extracted, is based on an interpretation of the field evidence as optimistic as is justifiable.” (Bulletin No. 13, New Series, Geological Survey Branch, p. 127.)

(v.) PROBABLE DURATION OF THE COAL RESOURCES.

The Director of the Geological Survey considers that the proved supplies of coal, more especially bituminous coal, are decidedly limited, and will approach exhaustion within one hundred years, or at most one hundred and fifty years from the present time. (Bulletin No. 17, p. 43.)

Writing of the bituminous coal to be found in the Westport district, he says, “The total amount of proved coal originally in the ground is estimated at 123,000,000 tons, of which about one-half, or 60,000,000 tons, may be considered extractable under present conditions, but of this 13,000,000 tons has already been mined, leaving only 47,000,000 tons as mineable. To the proved coal may be added a considerable amount of probable coal that may possibly be proved by boring to exist under the Westport flats and elsewhere. The whole situation, however, calls for the serious consideration of all interested in seeing that the far from inexhaustible coal resources of New Zealand are properly husbanded and utilized to the best advantage. In addition to bituminous coal, there are considerable quantities of brown and lignitic coal (in the district). The full extent of the areas containing these fields is not known at the present time.” (Bulletin No. 17, New Series, p. 190.) The same authority calculates that if the present yearly production (1913) increases at the rate of 5 per cent. per annum until half the coal is exhausted, and then decreases in the same ratio until the coal is worked, half the proved bituminous coal “will be mined in a little over fifty-two years, and all in less than one hundred and five years. If probable coal is included, almost half will be mined in seventy-five years, and all within one hundred and fifty-one years.” (“Coal Resources of New Zealand,” p. 8.) He expresses the opinion in regard to the Westport supply that “if the leases are taken as a whole, then, unless present conditions alter very greatly, not more than one-half, or possibly little more than one-third, of the coal in the mining leases will be extracted before the mines reach the stage of commercial exhaustion. An immense amount of coal will then be irrecoverably locked up in the forms of roof and floor coal not mined from thick portions of the seams, of pillar-stumps, of friable coal not mined because there would be a loss in so doing, of small isolated blocks which could not be economically reached by the transport roads, of thin portions of the seams (which would, however, be considered as of workable thickness in Europe and in most parts of the United States), of somewhat dirty coal (which in various parts of the world would be gladly accepted as fuel), &c. In addition, a considerable amount of coal will have been consumed or ruined by underground fires” (p. 43). The brown and lignite coals constitute the chief fuel reserve, and “quite possibly will be mined in considerable quantity two hundred or even three hundred years hence.”

(vi.) THE AMOUNT MINED.

In estimating the probable duration of the coal available for mining in the Dominion it is necessary to take account, among other factors, of the growth of the rate of production in the past in New Zealand. From the 1st January, 1853, to the 31st December, 1918, the quantity of coal mined in New Zealand amounted to about 48,000,000 tons, or nearly 5 per cent. of the total estimated proved coal. The following table shows the annual production of coal from 1878 to 1918 (inclusive) :—

TABLE 3.—YEARLY OUTPUT OF COAL IN NEW ZEALAND.

Year.	Tons.	Yearly Increase or Decrease.	Year.	Tons.	Yearly Increase or Decrease.
Prior to 1878	709,931	..	1898	907,033	Increase 66,320
1878	162,218	..	1899	975,234	.. 68,201
1879	231,218	Increase 69,000	1900	1,093,990	.. 118,756
1880	299,923	.. 68,705	1901	1,239,686	.. 145,696
1881	337,262	.. 37,339	1902	1,365,040	.. 125,354
1882	378,272	.. 41,010	1903	1,420,229	.. 55,189
1883	421,764	.. 43,492	1904	1,537,838	.. 117,609
1884	480,831	.. 59,069	1905	1,585,756	.. 47,918
1885	511,063	.. 30,232	1906	1,729,536	.. 143,780
1886	534,353	.. 23,290	1907	1,831,009	.. 101,473
1887	558,620	.. 24,267	1908	1,860,975	.. 29,966
1888	613,895	.. 55,275	1909	1,911,247	.. 50,272
1889	586,445	Decrease 27,450	1910	2,197,362	.. 286,115
1890	637,397	Increase 50,952	1911	2,066,073	Decrease 131,289
1891	668,794	.. 31,397	1912	2,177,615	Increase 111,542
1892	673,315	.. 4,521	1913	1,888,005	Decrease 289,610
1893	691,548	.. 18,233	1914	2,275,614	Increase 387,609
1894	719,546	.. 27,998	1915	2,208,624	Decrease 66,990
1895	726,654	.. 7,108	1916	2,257,135	Increase 48,511
1896	792,851	.. 66,197	1917	2,068,419	Decrease 188,716
1897	840,713	.. 47,862	1918	*2,034,250	Decrease 34,169

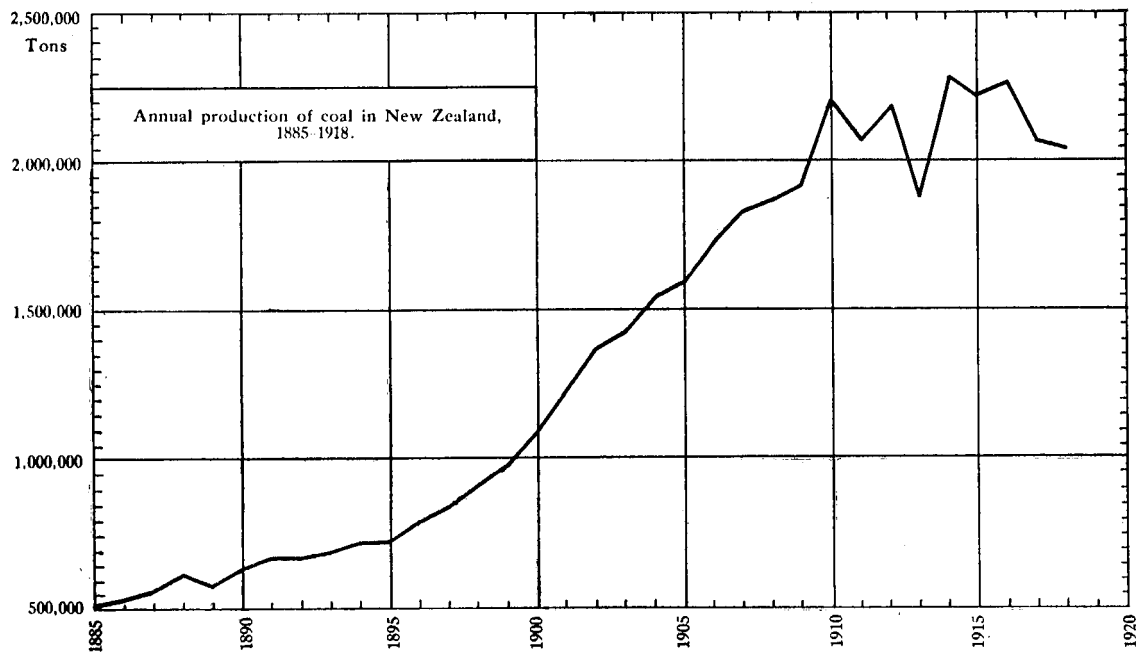
* Approximate.

With the exception of one year (1889) there is a continuous growth in the annual production up to 1910. The rate of this growth remained fairly even for the two decades following 1880. The output of 1881 was doubled by the end of the following decade, and the output of 1902 was double that for 1892. The decade succeeding 1902 showed a falling-off in the rate at which production grew—indeed, an absolute decrease for the year 1911, since which date there has been an alternation of annual increase and decrease till the last two years, which both show a decrease. Table 4 shows the annual production since 1885 and the moving averages for five-yearly periods so as to bring out clearly the general trend of the movement, which is well depicted on the accompanying graphs.

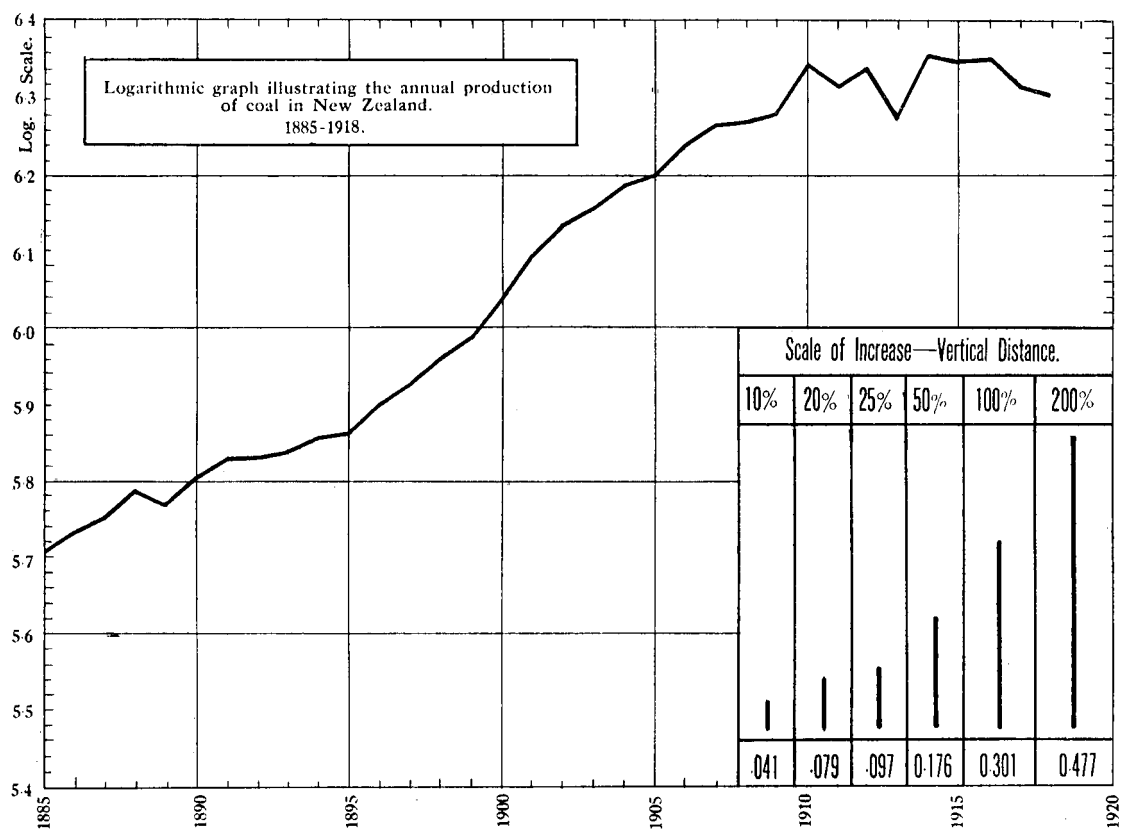
TABLE 4.—PRODUCTION OF COAL, 1885–1918.

Year.	Annual Production.		Quinquennial Period.	Average.
	Quantity.	Log. of Quantity.		
	Tons.	Tons.		Tons.
1885	511,063	5·70847	1885–89	560,875
1886	534,353	5·72783	1886–90	586,142
1887	558,620	5·74712	1887–91	613,030
1888	613,895	5·78809	1888–92	635,969
1889	586,445	5·76822	1889–93	651,500
1890	637,397	5·80441	1890–94	678,120
1891	668,794	5·82529	1891–95	695,971
1892	673,315	5·82822	1892–96	720,783
1893	691,548	5·83982	1893–97	754,262
1894	719,546	5·85706	1894–98	797,359
1895	726,654	5·86133	1895–99	848,497
1896	792,851	5·89919	1896–1900	921,964
1897	840,713	5·92465	1897–1	1,008,922
1898	907,033	5·95762	1898–2	1,113,319
1899	975,234	5·98915	1899–3	1,215,951
1900	1,093,990	6·03902	1900–4	1,328,472
1901	1,227,638	6·08906	1901–5	1,426,827
1902	1,362,702	6·13440	1902–6	1,527,207
1903	1,420,193	6·15235	1903–7	1,620,868
1904	1,537,838	6·18690	1904–8	1,709,025
1905	1,585,756	6·20025	1905–9	1,783,706
1906	1,729,536	6·23792	1906–10	1,906,026
1907	1,831,009	6·26269	1907–11	1,973,333
1908	1,860,975	6·26975	1908–12	2,042,654
1909	1,911,247	6·28131	1909–13	2,048,060
1910	2,197,362	6·34191	1910–14	2,120,929
1911	2,066,073	6·31515	1911–15	2,123,182
1912	2,177,615	6·33798	1912–16	2,161,394
1913	1,888,005	6·27600	1913–17	2,139,555
1914	2,275,593	6·35710	1914–18	*2,168,808
1915	2,208,624	6·34412	..	..
1916	2,257,135	6·35355	..	..
1917	2,068,419	6·31563	..	..

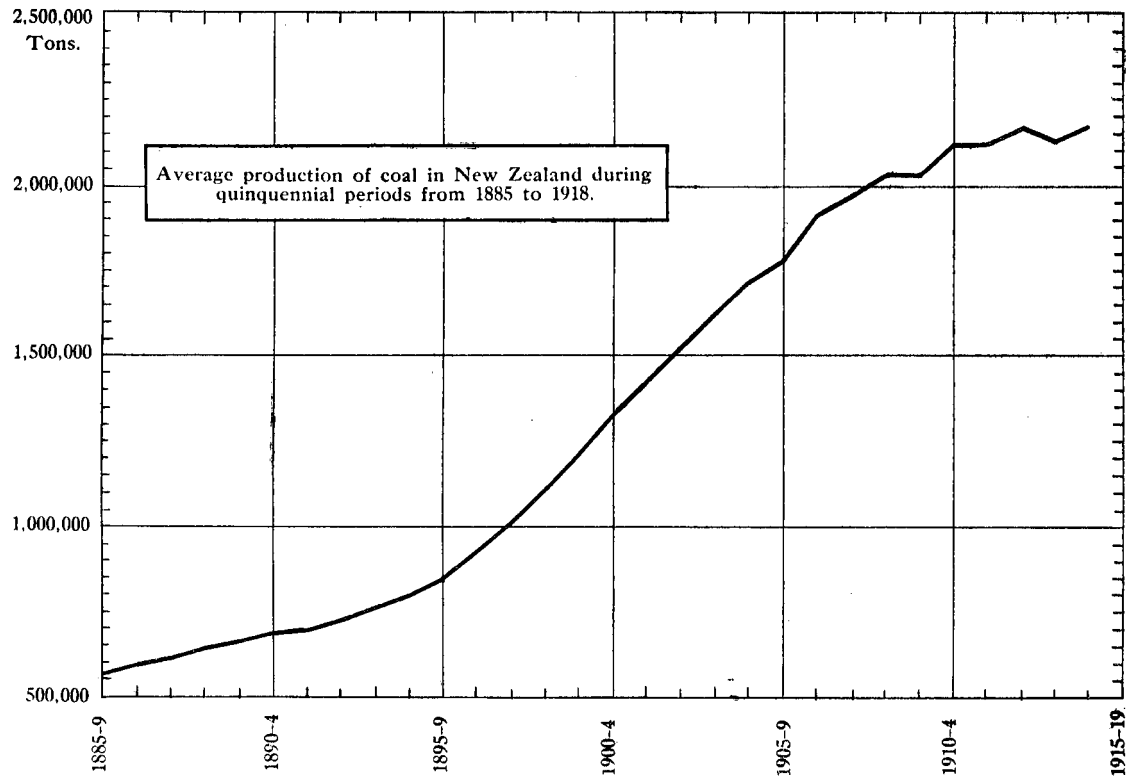
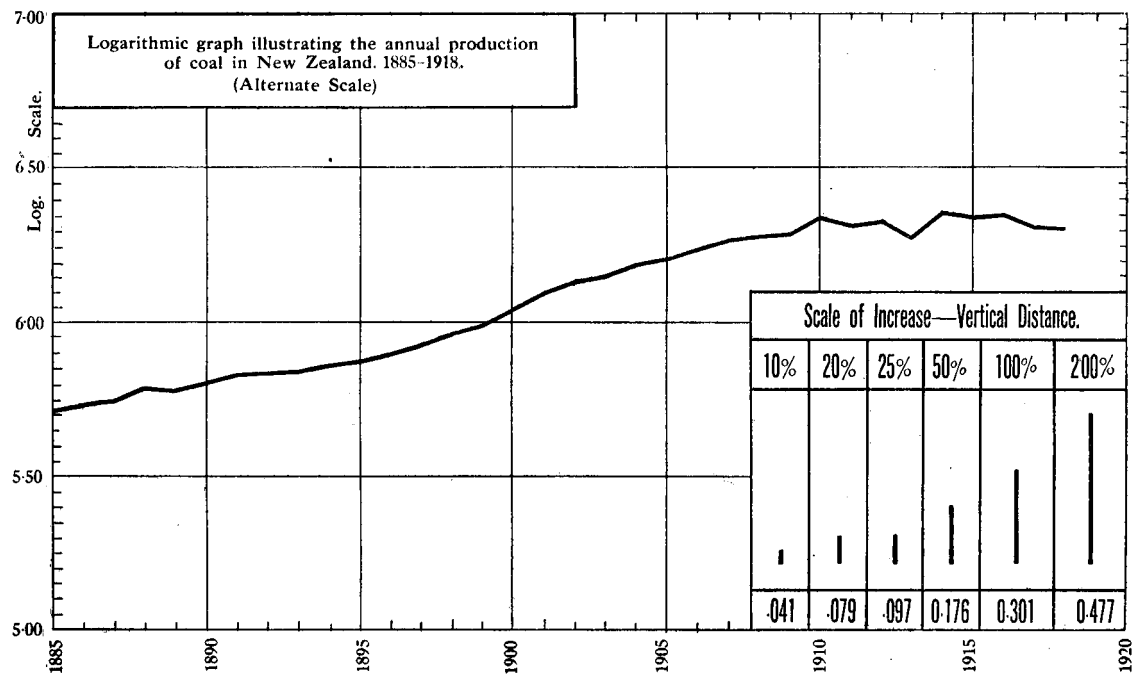
* Approximate.



This graph shows the actual increase or decrease in the production of coal, year by year.



This graph shows the *rate of increase* in the production of coal since 1885.



This graph shows the *general trend* of coal-production since 1885.

Professor Park ("Geology of New Zealand," p. 292) is of opinion that the choicest and most available half of our coal will have been consumed by 1970, and that the date of complete exhaustion should be somewhere about one hundred and thirty years from the present time; but this estimate is based on the assumption that the rate of increase in production indicated by the decade 1901–11 will continue in the immediate future. This assumption, however, has been temporarily falsified by the abnormal conditions created by the war.

The following table shows the contribution of each of the well-defined coalfields to the total output of coal in the Dominion up to the 31st December, 1918:—

TABLE 5.

Name of Coalfield.	Approximate Total Output up to 31st December, 1917.		Approximate Total Output up to 31st December, 1918.	
	Tons.		Tons.	
North Auckland	..	3,613,954	..	3,739,303
Waikato (including Mokau)	..	4,929,983	..	5,354,412
Nelson	..	328,287	..	342,241
Buller	..	15,053,254	..	15,634,050
Inangahua	..	279,275	..	395,512
Grey	..	9,170,671	..	9,566,773
Canterbury	..	736,660	..	757,135
Otago	..	9,127,443	..	9,443,892
Southland	..	2,919,063	..	3,069,522
Totals	..	46,158,590	..	48,192,840

The next table shows how the total output has been distributed over the different classes of coal:—

TABLE 6.

Class of Coal.	Approximate Total Output to the 31st December, 1917.		Approximate Total Output to the 31st December, 1918.	
	Tons.		Tons.	
Bituminous and semi-bituminous	..	30,048,697	..	31,171,005
Brown	..	13,774,384	..	14,480,157
Lignite	..	2,335,509	..	2,541,678
Totals	..	46,158,590	..	48,192,840

(vii.) THE RATE AND AMOUNT OF CONSUMPTION; EXPORTS AND IMPORTS.

The amount of coal annually available for consumption in the Dominion is ascertainable by adding the excess of coal imported over that exported during the year to the amount mined.

Tables 7 and 8 show this information as well as providing a means of comparison with the growth in population.

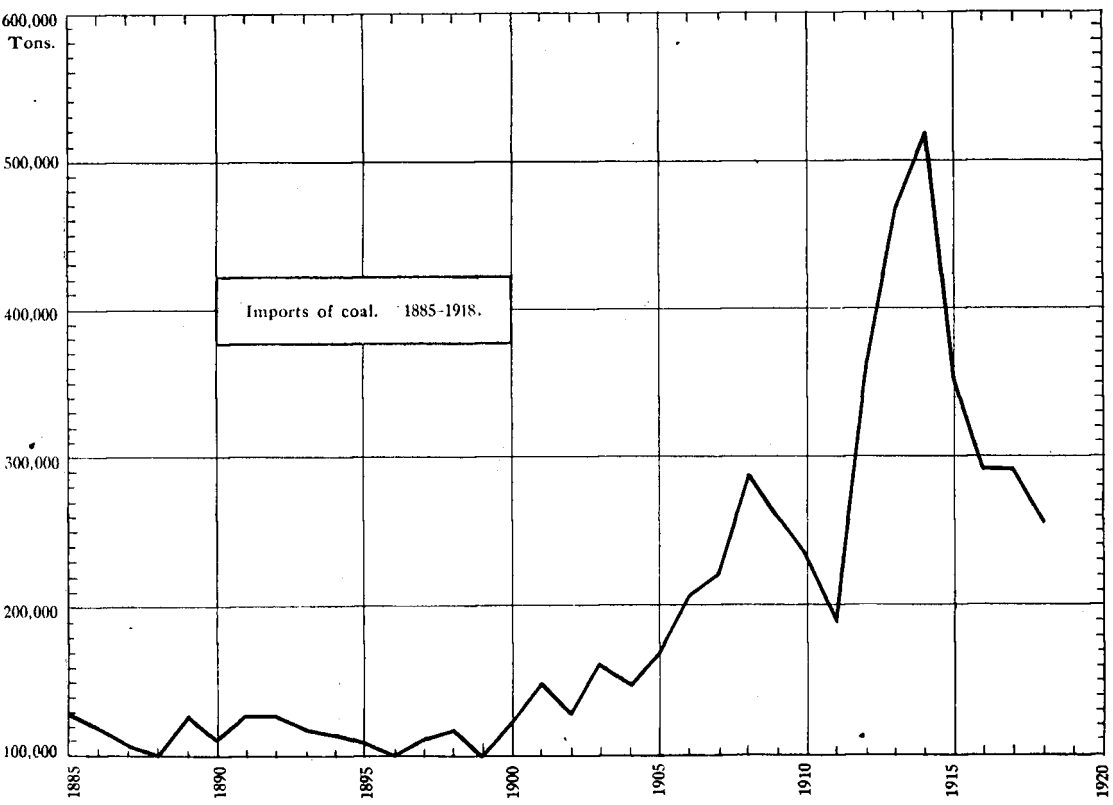
TABLE 7.—COAL-PRODUCTION, EXPORTS, AND IMPORTS.

Year.	Amount mined. 000 omitted.	Amount ex- ported. 000 omitted.	Amount im- ported. 000 omitted.	Year.	Amount mined. 000 omitted.	Amount ex- ported. 000 omitted.	Amount im- ported. 000 omitted.
	Tons.	Tons.	Tons.		Tons.	Tons.	Tons.
1878 ..	162	6	174	1899 ..	975	89	100
1879 ..	231	7	158	1900 ..	1,094	113	124
1880 ..	300	7	123	1901 ..	1,240	160	150
1881 ..	337	7	130	1902 ..	1,365	189	129
1882 ..	378	3	130	1903 ..	1,421	152	164
1883 ..	421	7	124	1904 ..	1,538	165	147
1884 ..	481	6	148	1905 ..	1,586	123	169
1885 ..	511	44	130	1906 ..	1,730	142	208
1886 ..	534	46	120	1907 ..	1,831	129	221
1887 ..	559	44	107	1908 ..	1,861	101	288
1888 ..	614	64	101	1909 ..	1,911	202	258
1889 ..	586	79	128	1910 ..	2,197	277	232
1890 ..	637	70	111	1911 ..	2,066	223	188
1891 ..	669	92	125	1912 ..	2,178	229	364
1892 ..	673	79	125	1913 ..	1,888	212	469
1893 ..	692	69	117	1914 ..	2,275	303	518
1894 ..	720	75	113	1915 ..	2,209	326	353
1895 ..	727	86	108	1916 ..	2,257	332	294
1896 ..	793	80	102	1917 ..	2,068	229	292
1897 ..	841	76	111	1918 ..	2,034	186	255
1898 ..	907	56	115				

Table 8 gives the imports in greater detail, and shows by means of the quinquennial averages and the accompanying chart the general trend of change.

TABLE 8.—IMPORTS OF COAL, 1885-1918.

Year.					Quantity.	Log. of Quantity.	Quinquennial Period.	Average.
					Tons.	Tons.		Tons.
1885	..	..	..	..	130,202	5·11461	1885-89	117,342
1886	..	..	..	..	119,873	5·07871	1886-90	113,489
1887	..	..	..	..	107,230	5·03032	1887-91	114,578
1888	..	..	..	..	101,341	5·00578	1888-92	118,223
1889	..	..	..	..	128,063	5·10741	1889-93	121,443
1890	..	..	..	..	110,939	5·04509	1890-94	118,423
1891	..	..	..	..	125,318	5·09802	1891-95	117,875
1892	..	..	..	..	125,453	5·09847	1892-96	113,163
1893	..	..	..	..	117,444	5·06982	1893-97	110,253
1894	..	..	..	..	112,961	5·05292	1894-98	109,850
1895	..	..	..	..	108,198	5·03423	1895-99	107,188
1896	..	..	..	..	101,756	5·00758	1896-1900	110,336
1897	..	..	..	..	110,907	5·04497	1897-1	119,957
1898	..	..	..	..	115,427	5·06232	1898-2	123,346
1899	..	..	..	..	99,655	4·99850	1899-3	133,046
1900	..	..	..	..	124,033	5·09353	1900-4	142,554
1901	..	..	..	..	149,764	5·17540	1901-5	151,556
1902	..	..	..	..	127,853	5·10670	1902-6	163,117
1903	..	..	..	..	163,923	5·21463	1903-7	181,696
1904	..	..	..	..	147,196	5·16791	1904-8	206,473
1905	..	..	..	..	169,046	5·22802	1905-9	228,671
1906	..	..	..	..	207,567	5·31716	1906-10	241,337
1907	..	..	..	..	220,749	5·34390	1907-11	237,438
1908	..	..	..	..	287,808	5·45911	1908-12	266,160
1909	..	..	..	..	258,185	5·41194	1909-13	302,386
1910	..	..	..	..	232,378	5·36620	1910-14	354,363
1911	..	..	..	..	188,068	5·27432	1911-15	378,582
1912	..	..	..	..	364,359	5·56153	1912-16	399,759
1913	..	..	..	..	468,940	5·67112	1913-17	385,207
1914	..	..	..	..	518,070	5·71439	1914-18	342,485
1915	..	..	..	..	353,471	5·54835	..	..
1916	..	..	..	..	293,956	5·46829	..	..
1917	..	..	..	..	291,597	5·46479	..	..
1918	..	..	..	..	255,332	..	..	..

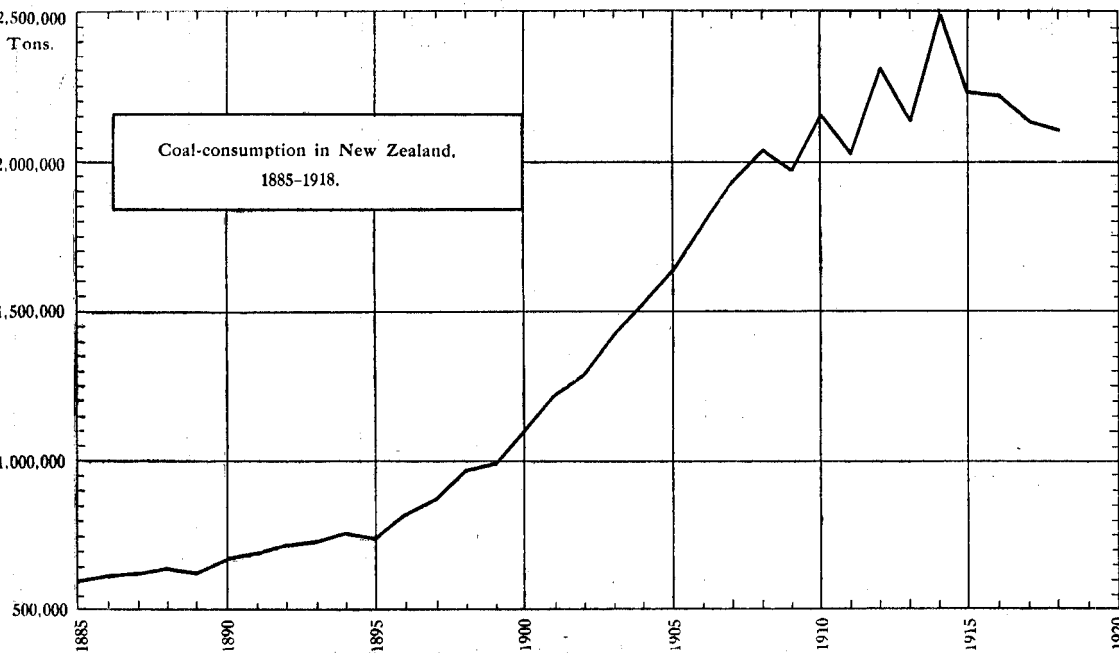


Graph showing changes in amount of imports of coal, year by year.

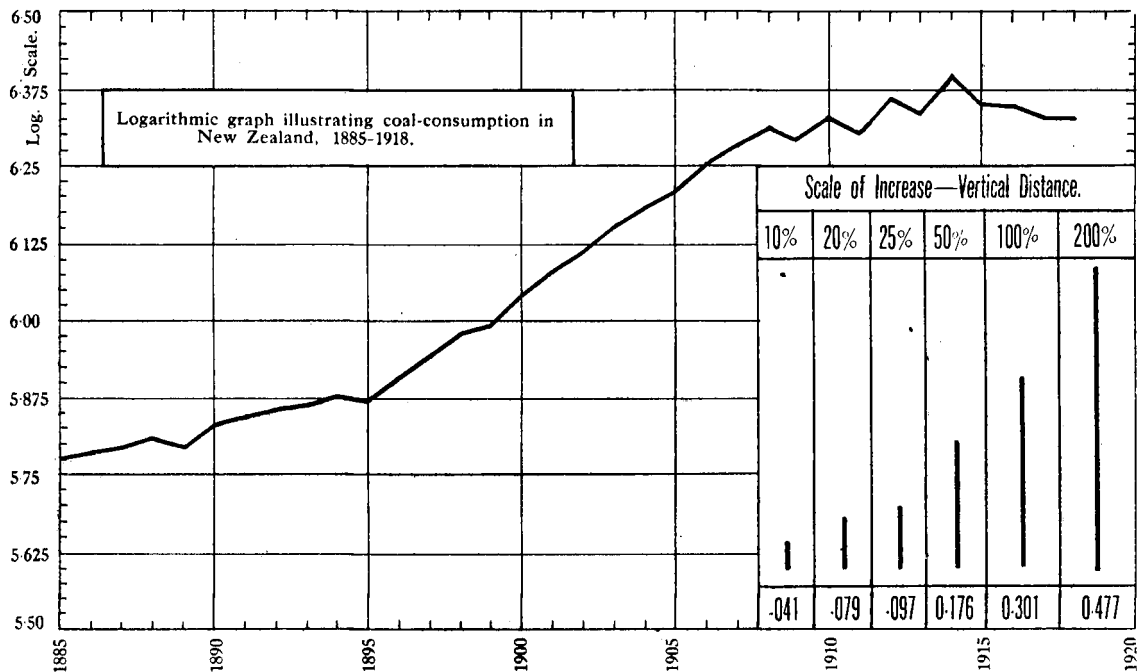
Table 9 shows particulars of the annual total consumption of coal in New Zealand since 1885, the annual consumption per head of population, and the general trend of consumption.

TABLE 9.—COAL-CONSUMPTION, 1885-1918.

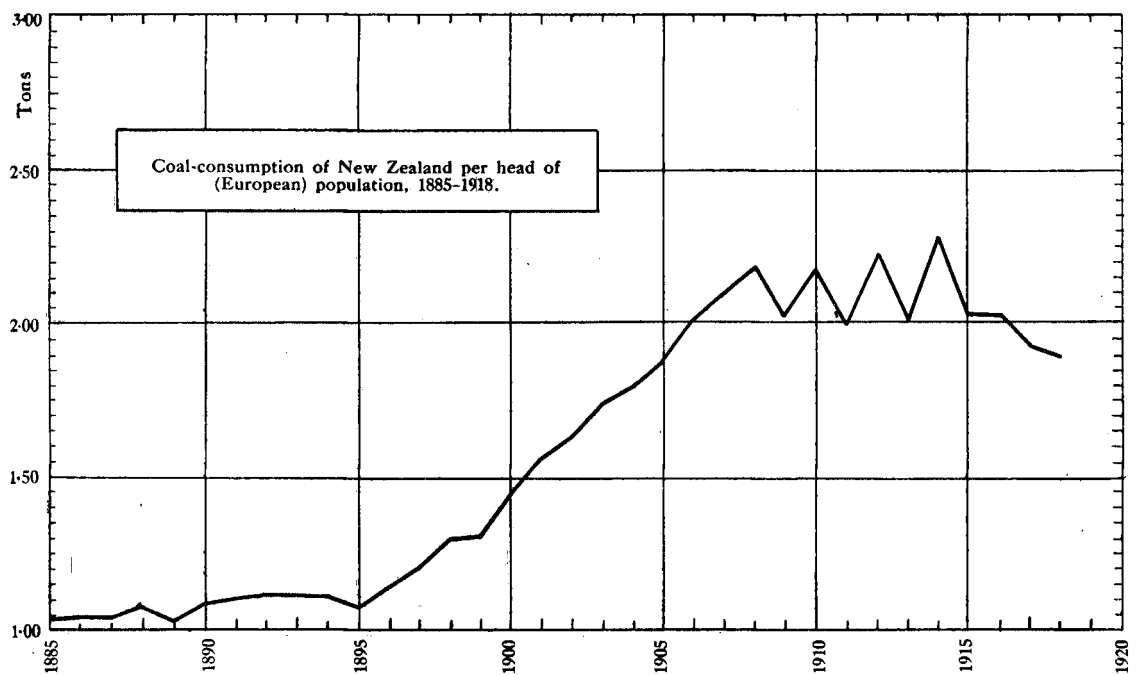
Year.	Consumption.	Log. of Annual Consumption.	Consumption per Head of Population.	Quinquennial Period.	Annual Average during Period.	
					Quantity.	Quantity per Head of Population.
	Tons.	Tons.	Tons.		Tons.	Tons.
1885	591,284	5·77179	1,038	1885-89	619,188	1,044
1886	607,686	5·78368	1,044	1886-90	635,321	1,053
1887	621,721	5·79359	1,043	1887-91	652,714	1,065
1888	647,149	5·81101	1,069	1888-92	671,240	1,079
1889	628,103	5·79803	1,027	1889-93	688,584	1,088
1890	671,948	5·82734	1,082	1890-94	713,476	1,103
1891	694,648	5·84177	1,103	1891-95	727,507	1,101
1892	714,354	5·85391	1,112	1892-96	750,243	1,109
1893	733,866	5·86562	1,110	1893-97	781,217	1,128
1894	752,562	5·87654	1,108	1894-98	825,898	1,168
1895	742,108	5·87047	1,072	1895-99	871,595	1,208
1896	808,327	5·90759	1,144	1896-1900	943,906	1,283
1897	869,224	5·93913	1,205	1897-1	1,024,032	1,366
1898	957,271	5·98103	1,300	1898-2	1,109,877	1,451
1899	981,046	5·99169	1,308	1899-3	1,204,019	1,540
1900	1,103,665	6·04285	1,445	1900-4	1,311,765	1,638
1901	1,208,954	6·08243	1,554	1901-5	1,417,370	1,724
1902	1,298,451	6·11344	1,628	1902-6	1,534,580	1,814
1903	1,427,980	6·15473	1,741	1903-7	1,659,436	1,908
1904	1,519,474	6·18170	1,798	1904-8	1,783,496	1,993
1905	1,631,994	6·21272	1,876	1905-9	1,873,129	2,035
1906	1,795,002	6·25406	2,004	1906-10	1,977,246	2,093
1907	1,922,728	6·28391	2,092	1907-11	2,024,290	2,090
1908	2,048,281	6·31139	2,167	1908-12	2,102,337	2,118
1909	1,967,642	6·29394	2,025	1909-13	2,121,720	2,085
1910	2,152,576	6·33296	2,168	1910-14	2,226,342	2,188
1911	2,030,223	6·30754	2,000	1911-15	2,243,448	2,112
1912	2,312,962	6·36418	2,226	1912-16	2,281,985	2,114
1913	2,145,196	6·33147	2,007	1913-17	2,245,627	2,058
1914	2,490,755	6·39634	2,284	1914-18	2,239,403	..
1915	2,238,103	6·34988	2,036	..	..	..
1916	2,222,908	6·34692	2,022	..	..	..
1917	2,131,173	6·32862	1,939	..	..	..
1918	2,104,075	..	..	..	..	..



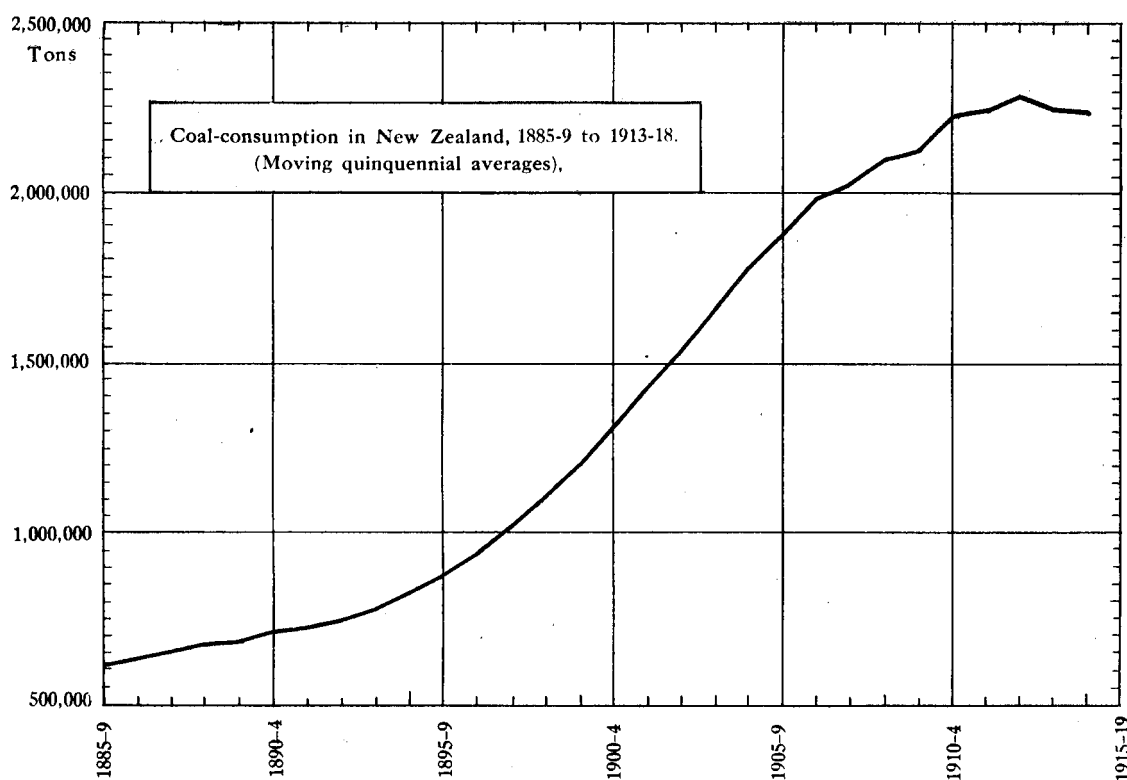
Graph showing changes in amount of coal-consumption, year by year.



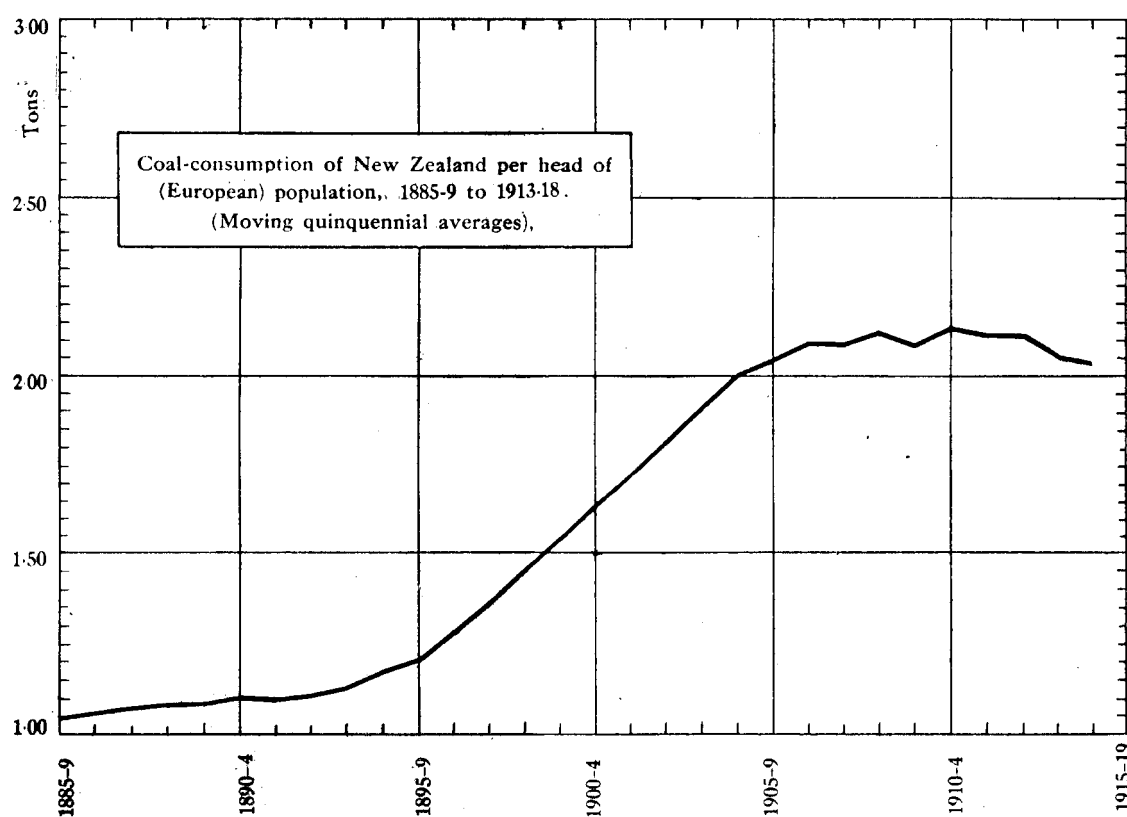
Graph showing *rate of increase* of consumption of coal.



Graph showing consumption of coal in relation to population, year by year.



Graph showing the *general trend* of total annual coal-consumption.



Graph showing the *rate of increase* of consumption of coal per head of population.

The coal exported is mainly for bunkering steamers trading to New Zealand, and for Admiralty purposes. The amount of exports has crept steadily up from the year 1866, when over a quarter of a million tons was sent away; but its value since the middle "eighties," when it attained 1 per cent. of the value of the total exports, has remained in almost constant ratio to that total. The marked increase in the "eighties" was due to Government endowment of the two West Coast coal ports, Greymouth and Westport, the institution of their Harbour Boards in 1884, and the improvements effected under the engineering schemes of Sir John Coode and the Boards' own engineers.

The amount of coal imported showed very little change till the last dozen years. In 1913 and 1914 the yearly figures were more than double those for 1878, and in 1912 and 1915 almost double. The value of the importation has increased in much greater proportion than the amount. The percentage which that value is of the value of our total imports has varied more than the corresponding figures for the export of coal.

TABLE 10.—RATIO OF VALUE OF COAL-IMPORTS INTO NEW ZEALAND TO VALUE OF TOTAL IMPORTS.

1882-83	..	..	..	..	..	..	2 per cent.
1884 ..	..	..	..	..	..	..	3 "
1885-95	..	..	..	..	..	..	2 "
1896-1907	..	..	..	..	..	..	1 "
1908-9	..	..	..	..	..	..	2 "
1910-11	..	..	..	..	..	..	1 "
1912-13	..	..	..	..	..	..	2 "
1914 ..	..	..	..	..	..	..	3 "
1917-18	..	..	..	..	..	..	1 "

Whilst the proportion which our coal-export is of our total exports has remained practically constant at 1 per cent., coal as an import has in recent normal years been slightly increasing its relative importance in the sum of imports. The proportion of the total coal consumed in the Dominion which is furnished by imported coal was comparatively large in early years (from one-third to one-fourth about 1880); it diminished till in 1900 it was about 10 per cent.; ten years later the proportion was much the same as in 1900; but subsequently it increased rapidly, and for 1914 imported coal provided more than one-fifth of the total consumption. During the war period, with the shortage of shipping, the proportion fell, till for 1918 it was not quite one-eighth. The great bulk of the imported coal comes from the Newcastle fields in New South Wales, and is specialized to certain uses, mainly railway transport and gas-making. The coal imported from 1878 to 1918 inclusive amounted to 7,524,000 tons, or a little over one-seventh of the amount of coal consumed in New Zealand during that period, and a little over 15½ per cent. of the amount produced within the Dominion.

The presence of large supplies of coal in Australia readily available for importation at a reasonable price has undoubtedly been one factor in preventing the appearance of monopoly in New Zealand coal-mining.

(viii.) OWNERSHIP OF COAL-SITES.

The land at present mined is owned in part by the Crown and in part by private individuals or corporations. The greater part of the more valuable coals are produced from Crown lands or lands vested in some public body, such as Harbour Boards, schools, and colleges. For some years past the policy of the Government has been to reserve to the Crown the ownership of all lands known to possess minerals or, wherever other rights appertaining to the land are alienated or temporarily transferred, to retain ownership of the minerals. The Coal-mines Act gives power to the Crown to resume private lands for coal-mining purposes on payment of compensation. Some of the companies at present operating own part of their fields, but the major portion of these are leased either from the Crown or private owners, in which case rents or royalties, calculated per ton mined, or rents merging into royalties, are paid.

2. HISTORICAL NOTE.

The existence of coal in certain parts of New Zealand was known shortly after organized settlement began. The history of the industry falls into three periods: up to the early "eighties," thence up to the end of the century, and from then to the present day. The first was a time of exploration, experiment, and many failures; the second, one of struggle against adverse circumstances, leading to consolidation of ownership of mines and the utilization of other valuable results of experience; the third, one of comparative but not unqualified success.

The first mention of coal on what are now the chief mining fields of the Dominion was made by Heaphy and Brunner in 1846, who discovered outcrops of lignite in the Westport district. Next year Brunner found coal on the Grey River on the present site of Brunnerton. Bituminous coal was discovered in the late "fifties"; and in the early "sixties" coal-mining began in both the Grey and the Westport districts. A certain amount of coal was exported from New Zealand in 1866.

TABLE 11.—EARLY EXPORTS OF COAL FROM NEW ZEALAND.

Year.		Tons.	Year.		Tons.
1866	..	261	1871	..	1,696
1867	..	973	1872	..	990
1868	..	1,027	1873	..	724
1869	..	750	1874	..	1,463
1870	..	1,672			

It was not, however, till the early "eighties" that coal-mining became of any importance. Up to that time the Maori troubles in the North, and the lack of communication facilities on the West Coast, as well as the small and sparsely distributed population, retarded its development. By the early "seventies" most of the important fields had been discovered, and at the middle of the "eighties" the making of the harbours at Greymouth and Westport cheapened the production and marketing of West Coast coal. The Homebush Colliery, in Canterbury, was opened in 1873; the Nightcaps Company, Southland, was formed in 1880, and the present Westport Company in 1881. The latter's newer mine at Millerton first produced coal in 1896. Towards the end of the "nineties" there was a tendency towards amalgamation of collieries; the present Taupiri Company was so formed in 1899, and the New Zealand Oil and Coal Company (Kaitangata) in 1898. In 1901 the State Coal-mines Act provided for the acquisition and working of State coal-mines under the direct control of the Minister of Mines; and two mines, the Point Elizabeth Mine, near Greymouth, and the Seddonville Mine, near Westport, were opened, the output stage being reached in 1904 and 1903 respectively. The Blackball Company had begun operations near Greymouth in 1893, and in 1905 the Paparoa Company was formed. In the latter year the Westport-Stockton Company began operations, and reached the output stage in 1908. Still newer collieries are those of the Pukemiro and Mount Torlesse Companies, which began to produce in 1915 and 1918 respectively.

The growth in the production, import, and consumption of coal has already been indicated by the statistics quoted in section 1 (vi) and (vii) above.

3. [CAPITAL] IN [THE COAL] INDUSTRY.

From the earliest days the coal industry has drawn a considerable part of the capital used in its development from sources within the Dominion. The necessary investments were made largely by men on the spot more or less familiar with local conditions. Even with the increasing scale of production the proportion of capital drawn directly from abroad is not large. Of the large mining companies whose affairs we investigated, all of which are of the joint-stock limited-liability type, only three have their headquarters situated outside the Dominion, and of these a considerable part of the capital is owned by local residents.

TABLE 12.—CAPITAL AND LOCATION OF THE CHIEF COAL-MINING COMPANIES OPERATING IN NEW ZEALAND.

Name of Company.	Situation of		Amount of Authorized Capital.	Amount of Paid-up Capital.	Residence of the Holders of the Majority of Shares.
	Head Office.	Mines.			
Blackball Coal Company (Limited) ..	London ..	Blackball, near Grey-mouth	£ 35,000	£ 28,330	New Zealand.
Hikurangi Coal Company (Limited) ..	Auckland ..	Hikurangi, near Whangarei	22,500	16,224½	"
Homebush Brick and Coal Company (Limited)	Christchurch	Homebush, Malvern Hills	17,000	17,000	"
Mount Torlesse Collieries (Limited) ..	London ..	Canterbury, inland	100,000	100,000	England.
New Zealand Coal and Oil Company (Limited)	" ..	Kaitangata ..	192,694	192,694	"
Nightcaps Coal Company (Limited) ..	Invercargill	Nightcaps ..	40,000	..	New Zealand
Northern Coal Company (Limited) ..	Auckland ..	Kiripaka, near Whangarei	49,500	42,797½	"
Paparoa Coal-mining Company (Limited)*	Wellington	Roa, near Grey-mouth	..	..	..
Pukemiro Collieries (Limited) ..	Auckland ..	Pukemiro, near Huntly	60,000	50,000	New Zealand.
Taratu Coal-mines (Limited) ..	Dunedin ..	Kaitangata ..	..	..	"
Taupiri Coal-mines (Limited) ..	Auckland ..	Huntly ..	150,000	141,000	"
Tyneside Proprietary (Limited) ..	Wellington	Brunnerton, near Greymouth	..	..	"
Waipa Railway and Collieries (Limited)	"	Glen Massey, near Ngaruawahia	80,000	79,905	"
Westport Coal Company (Limited) ..	Dunedin ..	Denniston and Millerton, near Westport	500,000	450,000	"
Westport-Stockton Coal Company (Limited)	Christchurch	Stockton, near Westport	200,000	179,191½	"
Government of New Zealand ..	Wellington	Dunollie and Rewanui, near Grey-mouth	..	..	..

* In liquidation.

A large part of the capital employed in coal-mining is fixed in form and specialized to particular uses. This fact, as well as the large amount of total capital required to open up and maintain a mine, makes it advisable, in order to minimize the cost of production per ton, to reduce the amount of time the mine is idle to the lowest possible extent. Every day of lost time piles up the standing or overhead charges connected with the capital cost, which must be borne by the output.

The interests common to the owners of capital invested in coal-mining are guarded by the New Zealand Coal-mine Owners' Association. This is a body consisting at present of eighteen members, all limited-liability joint-stock companies engaged in coal-production. Its activities are confined in

practice to dealing with industrial matters that closely affect the common interests of the members, including the demands of workers' organizations and proposed legislation dealing with coal-mines. It takes no part in the fixation of selling-prices, these being arranged by each company separately according to its own circumstances. Among its by-laws are enactments that "No commissions, bonus, rebate, fares, passages, hotel expenses, or allowances of any kind shall be made to any employee of any customer, either by any firm or member or their representative," and that "the provisions of the Secret Commissions Act must be strictly adhered to."

The income earned by capital in mining is subject to the ordinary income-tax. For local rating purposes it is the practice to assess the value of the coal presumed to be in the area worked by a coal company. In those cases where the land is privately owned the lessor's interest and the lessee's interest are separately assessed, but as leases invariably provide that the lessee shall pay all rates and taxes arising out of the mining operations, the payment of county rates usually falls upon the company. As soon as a colliery is opened up the Valuation Department assesses the value of improvements effected, and values the coal *in situ*. In those cases where counties impose rates on capital value, rates are paid on the valuation of the improvements, and on valuation of the coal presumed to be in the area. Wherever counties assess upon the unimproved value only, county rates are imposed upon the valuation of the coal.

A certain amount of dissatisfaction exists with the methods of the Tax Department in regard to allowance for depreciation in assessing income for tax purposes, and with the principle of assessing all the coal *in situ* for local rates.

4. LABOUR.

The number and classification of persons employed in the coal-mines of New Zealand for each year from 1878 inclusive are set out in Table 13.

TABLE 13.—LABOUR AND OUTPUT.

Year.	Persons employed.			Tons raised per Person employed Underground.
	Above.	Below.	Total.	
1878	147	366	513	443
1879	..	..	802	..
1880	..	..	1,038	..
1881	..	..	963	..
1882	..	..	1,043	..
1883	361	888	1,249	475
1884	393	890	1,283	540
1885	338	1,145	1,483	456
1886	392	1,213	1,605	440
1887	388	1,111	1,499	503
1888	414	1,275	1,689	481
1889	466	1,251	1,717	468
1890	512	1,334	1,846	477
1891	416	1,277	1,693	523
1892	485	1,196	1,681	563
1893	590	1,298	1,888	533
1894	506	1,393	1,899	516
1895	525	1,274	1,799	618
1896	590	1,347	1,937	588
1897	531	1,381	1,912	609
1898	556	1,447	2,003	627
1899	554	1,599	2,153	609
1900	617	1,843	2,460	593
1901	688	2,066	2,754	600
1902	803	2,082	2,885	655
1903	717	2,135	2,852	665
1904	763	2,525	3,288	609
1905	833	2,436	3,269	651
1906	1,174	2,518	3,692	687
1907	1,143	2,767	3,910	662
1908	992	2,902	3,894	641
1909	1,159	3,032	4,191	633
1910	1,136	3,463	4,599	634
1911	1,365	2,925	4,290	706
1912	1,130	3,198	4,328	681
1913	1,053	3,197	4,250	590
1914	1,176	3,558	4,734	639
1915	1,050	3,106	4,156	711
1916	988	3,000	3,988	750
1917	1,090	2,893	3,983	715
1918	1,102	2,892	3,994	703

The number of workers in and about the mines increased fivefold, comparing the average for 1879–81 with the number in 1914. The ratio of output to labour has increased at a still more rapid rate, so that the output per person employed underground increased nearly 70 per cent. between 1878 and 1916. It is worth noting that the three years of the war period, 1915–17, show the highest triennial average of output per man. The output per underground worker is higher than in most

other countries. Comparisons of this figure must, however, be taken together with information as to the height and width of the seams, the hardness of the coal, proportion of stone, the distances travelled underground, the amount of machinery used, and so forth, in the different localities or at the different dates compared, as well as the method of calculating the average number employed for the year. The number of mine workers decreased by 740, or nearly 16 per cent., from 1914 to 1918.

Table 14 shows how the labour-supply has been distributed over the principal collieries of the Dominion during the last two years.

TABLE 14.—LABOUR AT PRINCIPAL COLLIERIES.

Name of Colliery.	Locality.	Class of Coal.	Output for 1917.	Total Output to 31st December, 1917.	Total Number of Persons ordinarily employed.	Output for 1918.	Total Output to 31st December, 1918.	Total Number of Persons ordinarily employed.
<i>Northern District.</i>								
Hikurangi ..	Hikurangi ..	Semi-bituminous	Tons. 31,881	Tons. 1,099,922	95	Tons. 65,361	Tons. 1,165,283	109
Taupiri Extended ..	Huntly ..	Brown ..	192,205	2,182,181	339	234,633	2,418,470	442
Pukemiro ..	Pukemiro ..	" ..	89,375	181,966	145	114,458	296,424	160
Waipa ..	Glen Massey ..	" ..	81,718	319,699	100	69,085	388,784	73
<i>West Coast District.</i>								
Coalbrookdale ..	Millerton ..	Bituminous ..	279,760	5,252,425	440	240,096	5,492,521	406
" ..	Denniston ..	" ..	200,950	7,601,588	409	179,630	7,781,218	391
Westport-Stockton ..	Mangatini ..	" ..	167,122	1,203,492	280	154,120	1,357,612	276
State Coal-mines—								
Point Elizabeth ..	Dunollie ..	Semi-bituminous	119,411	2,255,717	189	95,106	2,350,823	134
Liverpool ..	Rewanui ..	Bituminous ..	145,856	472,471	302	113,013	585,484	298
Blackball ..	Blackball ..	" ..	132,515	2,588,380	286	121,259	2,709,639	234
<i>Southern District.</i>								
Kaitangata and Castle Hill	Kaitangata ..	Brown ..	107,274	3,507,495	288	124,985	3,632,480	293
Nightcaps ..	Nightcaps ..	" ..	73,133	1,254,144	116	53,805	1,307,949	109
Other New Zealand collieries	All coalfields	Various ..	445,519	18,329,110	994	434,554	18,408,459	934
Totals ..	..	..	2,068,419	46,158,590	3,983	2,034,250	48,192,840	3,994

The efficiency of the coal-worker in New Zealand, in the opinion of competent authorities, compares favourably with that of similar workers in the leading fields of other countries. A fairly large proportion of the miners are immigrants from the mining districts of England, Scotland, and Wales, many of them arriving after having worked for some time in the mines of Canada, the United States, and New South Wales. The coal-miner has strong migratory habits, developed, according to the opinion of the president of the Miners' Federation, largely by the rapidly changing nature of the conditions in which the miner works; he moves from one place to another to escape bad conditions or to discover better, and these conditions change more rapidly than is the case with most other workers. A classification of the miners in respect of birthplace promises interesting results. A witness of the widest experience and high authority was emphatic in the expression of his opinion that the native-born and locally trained New-Zealander makes the best miner. (On the other hand, the opinion of traders was just as emphatic that the immigrant miner excels in thrift and punctual payment of debts.)

It was interesting to find that a very large proportion of the management posts (mine and administrative) are filled by men who have risen to them through the ordinary grades of labour.

The employments in and about and essential to a coal-mine are many and varied. The following is a more or less complete list, excluding the clerical operations, as described by Mr. J. Bishop:—

Underground Labour.—Hewing (contract work), timbering, trucking and hauling, crushing, baling water and pumping, overmen and deputies, maintenance work, ventilation, lamp-trimming, mine-management.

Overground Labour.—Tipping, loading, screening, weighing, blacksmiths and fitters, carpenters, enginemen and stokers, engine-wright, tub-cleaning, general labour.

In the personal qualities that control the efficiency of an individual's work the average miner does not appear to fall below the level of other workers. The character of his work, much of which is by no means of a routine nature, calls for the exercise of intelligence, initiative, resourcefulness, and adaptability, whilst the fact that he is in continual contact with his fellow-men conduces to the discussion of ideas, though the position of the mining settlements, and their uniform class constitution, tend to narrow their views. The character of the underground work draws heavily on the mine worker's store of physical and nervous strength; and the light and air underground, even where conditions are most favourable, can never be as satisfactory as on the surface. The special dangers of mining help to develop certain generous traits of character, and the aggregation and isolation together breed a strong communal spirit; but the general environment is, in present conditions, not such as to moralize the work and the life—both individual and social—to the full extent that should be possible. Whether these conditions are capable of improvement or not is an important subject for consideration in the main part of the report. (See Chapters VII and VIII.)

Where conditions are favourable a few miners combine small farming with their mine-work, or alternate between farming and mining. Surface work, however, whether in town or country, is often repellant to the miner, who has grown accustomed to the even temperature of the pits.

The coal-mine workers are organized into unions. There is, generally speaking, a union in connection with each of the principal collieries, a local federation of such unions occupying a well-defined mining field, and finally a national federation of the unions of the Dominion. These unions discharge all the usual functions associated with trades-unions, and in one or two cases promote the organization of co-operative stores.

5. ORGANIZATION OF COAL-PRODUCTION.

(i.) The factors determining the *localization* of most industries are many and of varying force; with coal-mining they are few, simple, and direct in their action; coal must be mined where nature has placed it, and only there. The geographical distribution of the industry in New Zealand has already been indicated. The fact that it is not concentrated in one small area is another reason why the production has not been monopolized.

(ii.) The *scale of production*, too, depends largely upon natural conditions; one essential condition is a plentiful supply of coal. Wherever this exists, together with a large market for the product, the desire to reduce the cost of production per ton will extend the scale of operations of a particular colliery to the point where the maximum net return is reached. This point will not generally be attained until the original output has been enlarged by successive increments. Whether the scale of production be measured by coal produced, amount of capital used, or number of men employed, the mines in New Zealand do not provide examples of the large scale reached in many of the important fields abroad. Reference to Table 14 above will show that the two main mines of the Westport Coal Company (Limited) at Millerton and Denniston are on the largest scale found in the Dominion; then follow those of the Taupiri, Westport-Stockton, Blackball, and Kaitangata Companies, and the State, all of which are large mines, measured by local standards. Of the newer mines, the Pukemiro promises to grow most rapidly. There have been no recent amalgamations of companies with the view to establish economy of production by reducing the costs of management and administration per ton, or by concentration of the labour available upon the most promising parts of a given field instead of the most profitable parts of the several mines. In some cases—*e.g.*, the Westport, Blackball, and Northern Companies—the companies' activities include the carriage of coal at sea by their own colliers; in other cases, as at Kaitangata and Waipa, they provide railways for its transport to the most convenient point of loading in the State railway system.

(iii.) In connection with existing mines a considerable amount of *development work* is carried out in the shape of boring, tunnelling, &c., in order to test the nature and disposition of the coal-measures on the field and to ascertain the direction in which the most promising results may be expected.

(iv.) *The specialization or division of labour* has been already referred to in the preceding section, and appears to be as highly developed as circumstances warrant. In the strict sense of the term the coal-miners are the workers who hew the coal from the face of the seam. They work in pairs, each pair at a face, and the Coal-mines Act provides, in the interests of safety, that no man may be put in charge of a place until he has worked two years underground. His mate may have had no previous underground experience.

(v.) *Methods of Working*.—The methods of winning the coal, after the shafts and drives have been made, fall into two main classes: the bord-and-pillar method and the longwall method. The former is the one in general use in New Zealand, owing to the height of the seams and the weak character of the roof. The longwall system is used to a very slight extent in some small mines; and in some other cases the coal is merely quarried in an "opencast" mine. The following description of the common method, as followed on the Grey field, is taken from Bulletin No. 13 of the Geological Survey (p. 23):—

"The standard width of bord is 16 ft. to 18 ft., and that of pillars may be from 30 ft. to 75 ft. Thus the bords may be set out from the headings with centres varying from 48 ft. to 90 ft.

"Owing to the seams hitherto worked being as a rule over 8 ft. thick, longwall working has been little employed. This method, however, has been used in the Point Elizabeth State Mine No. 1 for thin portions of Nos. 1 and 2 seams.

"In breaking down coal the miner uses the time-honoured method of cutting and holing, followed by wedging, as little as possible. Holes having been bored by auger-drills, and the minimum amount of other preparation done, an explosive is employed to break out the coal. After cleaning and squaring up the face, the coal-getter repeats the various operations of cutting (if necessary), boring, and blasting. Where the seam is thick he works with a rough kind of bench, keeping the upper part of his face well forward.

"The method of working the pillars is to remove slices or 'lifts' 14 ft. to 15 ft. wide, starting from the end or stenton farthest in and working backwards to the main headings. As a rule, the removal of the last part or stump is troublesome, and it is in places necessary to leave a portion of the pillar on account of the danger or expense of removing it.

"The broken coal is filled into small trucks (tubs, boxes, skips, &c.), containing from 10 cwt. to 15 cwt. From the working-face the coal is transported by hand-labour, and in most cases with the aid of a jig also, to the level below. Hence it is hand-trucked, or drawn by horses, to the main haulage-road, and finally is conveyed to the surface by some form of rope haulage. On the surface the coal may or may not be passed over a picking-belt and through sizing-screens before it reaches the railway-trucks."

A modification of the ordinary bord-and-pillar method is that of the panel, which is followed in the Blackball Mine, with a view to reducing the loss from spontaneous combustion of the coal and from uplifting of the floors.

"The panels are 200 yards in length on the level, and extend to the rise till the old workings are nearly reached. At 50 yards on either side of the centre-line of each panel well-timbered headings (usual grade 1 in 6 to 1 in 8) are driven in the main or lower seam, and 18 ft. bords with 48 ft. centres are set off on either side. The inside bords are driven till they meet in the centre of the panel, but the outer bords are stopped about half a chain from the boundary. Thus a 66 ft. pillar is left between the panels.

"All or nearly all the bords in a panel having been driven, the pillars are drawn as quickly as possible. This work starts from the boundaries of the panel, and the coal is removed in 'lifts,' each about 30 ft. long, this being the width of the pillars, and a convenient length for handling trucks.

"When a panel has been worked out, stoppings are put in all the headings. These and other stoppings intended to wall off fires are built of stone with a fireclay centre. As the weight of the roof comes on the stoppings, they are so squeezed as to become airtight, if not so before."

On the Westport field the seams are "more or less variable in dip, strike, thickness, and quality, subject to rolls, intersected by numerous faults and stream-valleys, &c.," and the workings are therefore somewhat irregular. "The coal is won in the first place from bords" (Bulletin No. 17) "16 ft. to 18 ft. in maximum width, driven on the average 1 chain apart. They are sometimes broken away with a width of 12 ft. but in many cases are begun with the full width of 18 ft. The bords are connected at intervals of 1 chain by cut-throughs, ends, or stentons, which are usually of the same widths as the bords. Thus the pillars are normally 48 ft. square, but in practice there is considerable variation. Where the seam is thick, head coal is dropped, usually simultaneously with the working of the pillars, which are removed in 'lifts' or slices. In the Mangatini section of the Millerton Mine, where the coal reaches 50 ft. and more in thickness, the pillars are first split, then a small slice or lift is taken off each end. The top or head coal is then shot down (blasting-powder being the explosive*), and after the broken coal has been filled, another lift is removed in the same way as before. Great falls of coal often take place, and a pair of miners have been known to fill coal for several weeks from one place without ever having to break coal from the face. This process of working the pillars is continued until it is deemed unsafe to proceed any farther. In very thick seams there may be two or even three drifts one above the other, but there cannot well be more than one set of bords and of pillar workings. Necessarily a large percentage of the coal cannot be recovered from those portions of the seams with thickness exceeding, say, 16 ft. or 18 ft. Only by a filling-in method could all the coal be removed without frequent loss of life, but the cost of such a system renders it impracticable for the Westport district or any other locality in New Zealand until the selling-price of coal increases very considerably."

Although the use of machines for cutting and holing is now common in the collieries of the United States of America, New South Wales, and other coal regions, this work is still done by hand in our mines, except in parts of the Taupiri Extended Mine. Machines were introduced by the Westport Coal Company into their mines and used for some years, but were ultimately discarded because of the men's objection to the contract system under which they were worked, and the introduction of the eight-hours bank-to-bank rule rendering them a costlier method than hand-hewing. Machines were also used in the Westport-Stockton mines for some years, and abandoned owing to the difficulty of fixing a rate of pay for the men working the fillers.

The ventilation of the mines is regulated by statutory enactment, which prescribes a certain standard; so, too, is the method of lighting, which varies with the character of the gases. Where naked lights are used, carbide or colza-oil are the common illuminants. "Taken as a whole," says one authority, "the atmosphere of the mines more than favourably compares with that of the general run of workshops, mills, factories, &c." (Inspecting-Engineer Hayes, in "New Zealand Mining Handbook," p. 386.) Inflammable gases are present in some of the mines, and there have been three colliery explosions with large loss of life—at Kaitangata, February, 1879, thirty-four deaths; at the Brunner, near Greymouth, in March, 1896, sixty-six deaths; and in the Taupiri Mine, 1914, forty-three deaths.

Timbering is also regulated by law, the amount required necessarily varying with the nature of the roof, walls, and floor.

The legislation requiring lighting, ventilation, timbering, safe and dangerous places, &c., is strengthened by an elaborate system of periodical Government inspection, and of "check inspection" by employees of the unions, as well as by the daily rounds of the underviewers and the vigilance of the men themselves and the underground mine-managers.

(vi.) *Haulage*.—The transport of the coal from the face to the pit-mouth has already been described. More unusual and noteworthy as engineering feats are the systems of haulage from the pit to the point of rail embarkation, particularly at the three bituminous mines near Westport, and, until the opening of the Ngahere Railway, at the Blackball Mine. In the former case the coal is lowered over steep inclines from a height up to 2,000 ft., and in the latter it was conveyed by an aerial tramway over three miles long.

(vii.) *Wages and General Conditions of Work*.—Both the piecework and time-wages principles are applied in mine wages. The miners or hewers are generally paid so-much a ton for hewing (see Chapter V), this standard rate being varied according to the industrial agreement in operation, to allow for differences in height of coal, width of drive, amount of stone or water, &c., as the work

* "Permitted" explosives are now used.

progresses. In some cases wherever the difficulties of working a place reach a certain degree, the miner is paid the standard daily wage of his mine, which is in general 12s. a day plus bonuses. The miner pays for his tools, light, and explosives, some of which, however, are provided him by the company at prices much lower than the market prices. The miner is paid at an agreed rate for all timbering he may do. In addition to hewing he has to fill his trucks and take them to the flat, any distance up to a chain. Every three months there is held a cavel or ballot, according to which the working-places are allocated among the miners.

In some mines the truckers, who take the coal out from the miner's face to the pit-mouth, also work on contract at piece rates, but most truckers, as well as the other workers about a coal-mine, are paid a daily wage. All the mine workers obtain coal for their own use at a price much lower than the local market prices.

The eight-hours bank-to-bank principle is generally applied, with slight modifications in certain cases. The time actually put in at the working-faces varies with the travelling-distances underground. Double shifts are worked in some mines.

Wages are paid fortnightly. The miner's maximum working-time per fortnight is by custom regarded as eleven shifts, since "pay-Saturday" is traditionally an off day. The largest proportion of voluntary absence from work occurs during the early part of the week following pay-Saturday. This has sometimes been used as evidence in support of the contention that such absence is caused mainly by intemperance, though it is obviously the period during which the miner would find it most convenient to take time off voluntarily from whatever cause.

Disputes regarding wages and general conditions of work are settled by the process of collective bargaining between the company and the representatives of the men's union. Recently a system has been adopted for the reference of a dispute in the first instance to a local council of representatives of workers and employer, then, if necessary, to a similar district council, and in the last resort to a national council.

(viii.) *Housing and General Social Environment.*—The present condition of the housing-accommodation available for mine workers is described with some detail in Chapter VII. It is unnecessary to say more here than that a considerable number of the married miners live in their own houses, that at some of the mines a certain amount of house-room has been provided by the companies themselves for sale or lease to the workers, and that, however satisfactory the position is at some centres, in general it urgently demands improvement. This is true not only of the housing-accommodation itself, but also of drainage and other sanitary arrangements. The situation of the townships is in some cases such that many of the workers have an unduly long distance to travel, often over very inconvenient ways and with no satisfactory means of transport available. Generally there has been in the past insufficient co-ordinated efforts by all concerned to provide for needs beyond those of the moment.

Many of the mining townships are remote from the larger centres and the amenities of social life which they provide, with little or nothing to compensate for the absence of these or of the opportunities of enjoying them by means of rapid and cheap travel. In general, the companies have done a good deal to ameliorate the social conditions by providing recreation halls and grounds, clubs, libraries, &c., out of their own funds, but the general problem is too large to be solved by their resources alone, and is one, too, in which the whole community is concerned.

In only one or two cases, notably at Runanga and Blackball, has there been any attempt on the part of the miners to establish co-operative stores with the object of obtaining common commodities and services at the lowest possible prices.

Primary education is provided in the mining townships as part of the system common to the whole Dominion, no differentiation being made either against or in favour of these settlements. The miners in some of the townships share the serious disability in regard to the opportunities for the secondary education of their children which all people of similar means suffer in the more remote and sparsely settled districts. Technical instruction in mining and allied subjects is provided at those centres where there is a School of Mines (Westport, Huntly, Reefton) or Technical College, but these are few, and the majority of the mining population is without opportunities of this kind. Almost nothing has been done in the direction of instituting, even on the larger fields, some systematic general education of a nature suitable for adult workers, and the demand for W.E.A. and University extension classes, as well as for the lighter recreative forms of education, remains unsatisfied, largely because of lack of funds to provide the necessary teaching and equipment.

The health of the mine worker and his family, and his support during illness and injury, are the joint care of the workers themselves through their Medical Associations, the coal-mine owners, who contribute a statutory payment of $\frac{1}{2}$ d. a ton to the Coal-miners' Relief Fund, and the Government and local bodies, which may subsidize or otherwise supplement the provision thus made. There is hospital accommodation on most of the coalfields, but in one or two instances local needs are not satisfactorily provided for. The provision that no worker shall be entitled to payment out of the Relief Fund unless he shall have been so disabled as to prevent him from working for not less than a week is both an encouragement to the malingerer and a grievance with the more conscientious miners.

(ix.) *State Aid in Mining.*—This is given directly, as by subsidies in aid of prospecting, loans for the development of mines, subsidies to Schools of Mines, the free loan of prospecting-drills, the advice of its Inspectors and officials of the Mines Department, or indirectly, as by the comparatively low rate of duty imposed on the import of mining machinery. The legislation affecting coal-mining is embodied mainly in the Coal-mines Act (1908, No. 24), and its amendments, and the regulations made under their authority.

6. THE ORGANIZATION OF THE DISTRIBUTION OF COAL.

The great bulk of the coal disposed of is sold by the mines wholesale, the companies arranging contracts, as with gasworks, shipping companies, the railway, &c., or selling either directly or through agents to merchants or other purchasers f.o.b. or f.o.r. In only a few cases does the coal company retail part of its own coal, the Westport Coal Company, the Blackball Coal Company, the Pukemiro Collieries, and the State mines being the chief examples. The coal is in each instance graded according to size as it comes off the mine screening plant, the selling-price varying with the grade. In the majority of cases there are only three or four grades—viz., house or best screened; steam-coal (of smaller size); slack or small; and through coal or the run of the mine (the coal as it comes from the working-face). It has already been noted that the small coal is difficult to sell; the price obtained for it is low and inelastic; and as it costs the same to mine as the large coal, much of any increase in the cost of mining must be borne by the grades other than small, for which the demand is less elastic. In many of the mines a very great amount of small coal is absolutely wasted for lack of a market.

The freight charges from the mine to the merchant's depot are usually paid by the merchant. In some cases (the Westport, Blackball, Northern) the coal companies own colliers that carry part of their own coal, but in general the coal is transported by carriers separate from the mining companies. The impossibility of the mines obtaining the controlling interest in the internal means of transport in New Zealand has been a third powerful obstacle to the growth of monopoly in mining.

The process of distribution to each of the chief consuming centres is described in detail in Chapter III. Only the most general features need mention here. At some of the West Coast mines the coal is stored in bins whilst waiting shipment. It is run down to the wharves in railway-hoppers carrying about 8½ tons, which are lifted over the steamer's hold and emptied by automatic opening of the lower part, and then replaced on the body of the truck. At the port of arrival, discharge may be into either hulks, or trucks, or drays, by the slow sling process. In most cases the retailer carts from ship or truck, as the case may be, to his yard, loose or bagged. In his yard the loose coal is trimmed, screened, and bagged, after which it is carted to the consumer. Cartage is mostly by horse and dray. The wholesale merchants have contracts with large consumers requiring coal all the year round for industrial or semi-industrial purposes, and in most cases they also compete as retailers for the house trade. In very few cases is the business of a coal merchant or retailer restricted to dealing in coal; it extends usually to other forms of fuel, to general carrying, and to produce. In only two or three cases is the distribution of coal undertaken by a co-operative society.

7. SOME CHARACTERISTIC FEATURES OF COAL AND THE COAL TRADE.

Before passing on to the main topics of costs of production, prices, profits, and earnings, we should mention certain leading facts regarding coal itself, and the trade in it, that must be borne in mind in considering these subjects.

(i.) In the first place the definition of "coal" is not so clear as it appears at first sight. When the "man in the street" talks of coal, he has in mind the coal he burns at home in the range and grate; but this is only one out of many "coals," several of which are used for the same purpose he has in view. There are the coals differentiated according to chemical composition—anthracite or semi-anthracite; bituminous; semi-bituminous, glance, pitch; brown; and the lignites; and these are in reality, from the economic standpoint, different commodities. But in addition there are the imported coals; and, in respect of nearly every class of coal as defined, there are the further distinctions alluded to in the previous section between large coal, steam-coal, through coal, and small coal or slack. These classifications or grades of coal may be combined in all possible ways. It should therefore be recognized that before any deduction be drawn from the mention of "coal," inquiry must be made as to the precise thing meant. From some mines seven or eight kinds of coal are obtained. These have all different uses, though, with relative prices changing, one may be substituted for another. The demand for them is of varying elasticity, elasticity of demand being measured by the degree to which it changes for a given alteration in price.

(ii.) Comparison of the prices of "coal" cannot be trustworthy unless the facts under (i) are taken into consideration. But when comparing prices at one date with those of another we must further ascertain whether there has been any change in the nature of the particular kind of coal in question. For example, the house coal of 1918 in many localities was different from the house coal of 1915 or 1916, even though from the same mine, because of the omission of the second screening in the dealer's depot, thus resulting in a much larger proportion of small. In comparing prices it is also necessary to ascertain any alterations in quality, or in the amount of discount allowed, or in the arrangements as to who shall pay carriage or incidental charges.

(iii.) The New Zealand coals are peculiarly friable, breaking easily at every handling. Some are so friable that they cannot be screened with profit. It is therefore necessary to reduce handling to the minimum, from the desire both to keep down cost and to preserve the quality of the coal. If, for example, a certain coal is screened at the mine, it may yield 40 per cent. large and 60 per cent. small. The large, after being handled *en route* to market, when screened in a dealer's yard may yield 15 to 20 per cent. of small.

(iv.) The high water-content of many of our coals unfits them for storing anywhere for any appreciable period except in the mine itself. The best brown coal will not last even under cover from four to six months without very considerable waste. Consequently, even when production is abundant, the stock of such coal in existence at a given date can never be a large proportion of the total amount

required during the season. This quality of the coal, conjoined with the last mentioned, makes the problem of storing coal at the mines or ports during waits for shipping a very difficult one.

(v.) Though the ultimate market values vary according to the different kinds of coal and their different uses, many of the costs of production and distribution are the same per ton, irrespective of the kind. Much of the cost of transport, for example, is the same whether the coal be large or small bituminous, or large bituminous or small brown. (The Railway Department charges differential rates: the highest on Australian coals, the medium on New Zealand bituminous, and the lowest on native brown coal.) One hewing-rate is paid for all coal in the same mine, with slight variations already pointed out in section 4 (vi) above. Many of the costs of distribution are the same whatever be the kind of coal traded in.

(vi.) It may be useful to set out here some of the main factors determining the price of coal as a preliminary guide to the subsequent more detailed treatment of prices in Chapters II, III, and IV.

It is a truism to say that the price is determined by supply and demand; it is necessary to analyse the conditions governing both supply and demand, and to ascertain how changes in these may affect one another and the price. On the side of demand the leading idea is utility, on the side of supply it is cost; price is fixed by the balancing of considerations of utility against those of cost. The utility of coal to the purchaser depends on the degree to which it serves his particular needs, and the intensity of his needs are determined largely by individual taste, habit, and fashion. But mere desire or need alone is insufficient to constitute an effective economic demand for coal; it must be accompanied by the offer of something in exchange—a price. Purchasing-ability is therefore an essential condition of demand, and, obviously, the total amount demanded at a given price will also depend on the number of persons who enter the market as purchasers. The price which purchasers are willing to pay for a given amount of the commodity is the *demand price*. But the amount of the price actually paid cannot be fixed solely by the intensity, effectiveness, and amount of the demand. The conditions which govern the supply of coal are also effective factors in fixing the actual price; the amount demanded may be producible at a high cost or at a low cost, and it is obvious that the higher the cost the higher the price that will evoke that supply and make it available to purchasers, and, conversely, the lower the cost, the lower the price. The cost of production varies according to the degree to which supply is limited. Supply may be limited by nature, by the great cost or effort involved in production, by monopoly, or by legislation restricting the action of producers. These are the broad factors that determine what may be called the *supply price*—that is to say, the price which will just satisfactorily remunerate those who are producing the commodity.

The price actually got in the market, where bargaining is free between producers and dealers and consumers, will in the long-run tend to coincide with the supply price or cost of production. But over a short period which is not sufficient to allow the producers to readjust their factors of production to changes in demand the price may depart much from that point. If the demand rises, then until such time as the supply can be increased by the existing means of production or their extension higher prices will be paid, because increased demand implies a greater effective desire to purchase. The tendency to a rise in price will be strengthened if at the same time there is a change in the conditions of supply leading to a decrease in the amount produced. Such actually were the broad features of the situation in the coal trade in New Zealand during the period under review. Supplies fell off owing to certain causes, mainly lack of shipping and shortage of mine labour, whilst the demand increased through a more intense need for coal, coupled with greater purchasing-power to attain that end. The coal-mining businesses of the Dominion in general conform to the principle of diminishing costs, or, what is the same, increasing returns—that is to say, they are at such a stage of development that, “other things equal,” they can increase their outputs at a greater rate than their total costs, so that an increasing output means a decreasing cost of production per ton, or the expenditure of a given sum means an increased return thereto; conversely, a diminishing output such as has ruled of late means an increasing per ton cost. But “other things” did not remain undisturbed; besides the mere fall in the output, due to shortage of labour, in itself sufficient to account for a rise of cost, there was the increase in the cost of most of the materials necessary to work the mines, and in the cost of the available labour. On the side both of supply and demand the altered conditions were therefore such as to raise market price. In the particular circumstances, lack of ships and labour, there appeared to be little hope of influencing supply in the direction desired, and little, if anything, was done to restrict demand. Rationing apportioned the supply more evenly over those demanding coal, but could not influence the effectiveness of their demand. The rising price had some effect in turning part of the old demand for coal into a demand for some substitute such as wood, which in turn raised its price; but in many cases substitution took the form of using one kind of coal instead of another, or of using gas, which in itself involved the consumption of coal. The substitution of lignite and brown coals for bituminous as house fuel led to a considerable rise in their demand price, as the demand for the inferior coals is much less elastic than that for the superior—in other words, the demand for them does not fall off in proportion to the rise in their price. When coal rises in price, the inferior qualities can be substituted for the better, and it is comparatively easy for the consumers of the better-class coals to economize in consumption.

The different kinds of coal from the same mine are what is technically known as “joint products”—that is to say, they are produced by one and the same process and at the one cost. It is impossible to distinguish between the cost of producing large or house coal and the cost of producing slack from the same working-place. The total price received must be such as to return in the long-run at least the cost of production of both; but their relative prices, subject to that condition, are determined by the relative demands for them. If cost of production rises, the greater part of the increased cost will be allocated to that one of the joint products—best screened or house, in the case of coal—for which the demand is the more intense, and which, therefore, will attract a higher price.

CHAPTER II.

COST OF PRODUCTION OF COAL.

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1. DEFINITION.

REFERENCES 1 and 2 are most conveniently taken together, with due regard to the distinction (1) between the production and the distribution of coal, and (2) between the present costs of production and of distribution and the previous cost levels, both before and during the war period. Production is taken to mean all the processes involved in bringing the coal to the point whence it is passed on to the coal-dealer, wholesale or retail. Therefore the costs of production include all costs, direct and indirect, up to the point f.o.b. or f.o.r. at the mine, freight to market usually being paid by the dealer, and in all cases being easily separated and measured and allocated to distribution-costs. Some companies, however, with mines situated a certain distance from the nearest main railway-line or seaport include in their costs of production the haulage (railway) charges from the mine-mouth to the railway junction or the seaport. For some purposes of this report this definition has been accepted; for others these haulage charges have been deducted. Wherever it is necessary to do so in the report a note is made as to which cost is referred to in the immediate text. The cost of distribution is defined as the expense involved in the transport of coal and dealing in it from the point of delivery by the mine-owner to delivery into the consumer's bin.

For the purpose of assessing the cost of production the Board obtained from the owners of the principal coal-mines in the Dominion an analysis of the output and the cost of mining coal over the period 1913-18. This cost is worked out per ton to a small fraction of a penny for each mine for each of the following particulars:—

- (1.) Coal-winning : Hewing, trucking, other labour, mine-management.
- (2.) Haulage.
- (3.) Screening and weighing.
- (4.) Maintenance.
- (5.) Development.
- (6.) Other costs to f.o.b. or f.o.r.
- (7.) Stores and materials.
- (8.) Royalties : (a) Crown, (b) private.
- (9.) Rates and taxes.
- (10.) Insurance.
- (11.) Miners' Relief Fund.
- (12.) Depreciation.
- (13.) Administration.
- (14.) Interest (loans or overdraft).
- (15.) Total mining-costs.
- (16.) Mine-owners' profit.
- (17.) Selling-price f.o.b. or f.o.r.

2. TOTAL COST AND ITS CHANGES DURING THE PERIOD.

Table 15 gives the names of the principal collieries or groups of collieries from which complete returns were obtained with their output each year of the period under inquiry. The date in column 1 is that of the end of the company's financial year. This table should be compared with Tables 3, 4, and 14.

TABLE 15.—OUTPUT OF COAL OF PRINCIPAL COLLIERIES, 1913-18.

Company or Mine.	Output.					
	1913.	1914.	1915.	1916.	1917.	1918.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Westport (30th September) ..	638,963	521,772	615,184	512,686	484,340	460,993
Westport-Stockton (31st December) ..	93,508	149,633	147,018	183,132	166,716	156,575
Blackball (31st December) ..	143,836	217,437	216,896	203,647	132,515	121,259
Paparoa (31st August) ..	31,869	50,243	43,427	32,178	33,290	42,668
	(31st December)					
Liverpool (31st March) ..	..	..	85,067	116,566	130,224	124,694
Point Elizabeth (31st March) ..	162,373	109,471	116,926	125,475	127,324	111,671
Tyneside (30th September) ..	34,370	31,325	28,190	17,285	15,758	16,551
Northern (30th September) ..	55,054	61,093	49,112	61,660	48,383	50,438
Hikurangi (31st December) ..	42,676	45,236	64,274	48,277	..	65,361
Taupiri (31st March) ..	218,128	233,933	230,936	229,109	182,084	211,111
	(31st December)					
Pukemiro (31st August) ..	..	..	..	60,810	86,314	112,264
Waipa (31st January) ..	..	56,000	99,000	89,500	81,100	66,500
Homebush ..	9,732	8,210	8,999	11,837	16,248	10,092
Kaitangata (20th February) ..	140,224	139,685	127,880	105,063	93,696	55,105
	(20th February, 1914)					(six months to 31st August)
Nightcaps (30th September) ..	88,453	69,953	66,041	79,927	75,666	60,818

Eight mines, among them most of the largest, show a diminished output during the period.

Table 16 shows the complete cost of production per ton of coal mined in the chief mines of the Dominion for the years 1913 to 1918 inclusive. In each case the figures are for the financial year of the mine.

TABLE 16.—COST OF PRODUCTION PER TON AT PRINCIPAL MINES, 1913-18.

Mine.	Mining-cost of Production per Ton.						Increase per Cent.	Increase.
	1913.	1914.	1915.	1916.	1917.	1918.		
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.		s. d.
A ..	13 5·99	14 0·29	12 10·7	11 2·98	11 1·66	11 3·3	20 (fall)	2 2·69 (fall)
B ..	10 10·95	10 1·17	10 8·8	13 4·5	16 5·19	17 10·21	63·6	6 11·26
C ..	14 4·82	16 2·5	16 10·78	18 0·04	19 4·86	22 7·61	57·2	8 2·79
D ..	12 4·5	10 3·5	11 8·25	11 10·0	19 9·5	14 4·5	16·2	2 0·0
E ..	15 6·23	16 1·42	15 5·64	16 8·65	19 4·58	23 3·77	50·2	7 9·54
F ..	12 6·43	11 5·42	11 2·23	12 6·44	14 5·31	16 2·444	29·25	3 8·01
G ..	10 0·17	8 8·9	8 10·69	9 11·22	12 3·29	13 1·91	31·66	3 1·74
H ..	13 5·43	13 0·38	13 6·51	17 1·48	20 9·79	20 11·49	56·0	7 6·06
						(6 months)		
I ..	6 5·5	6 11·75	6 9·62	6 7·62	8 4·5	10 6·25	63·0	4 0·75
J ..	..	8 11·5	9 5·4	9 4·1	9 1·8	10 6·6	18·0	1 7·1
						(5 years)		
K ..	..	..	..	..	..	11 2·3	..	..
L ..	..	8 4·5	7 10·1	8 6·7	9 8·9	10 7·3	26·7	2 2·8
						(5 years)		
M ..	..	16 0·41	20 9·39	17 7·44	17 7·56	25 6·21	59·0	9 5·8
						(5 years)		
N ..	..	..	..	17 1·7	18 5·8	18 3·3	6·6	1 1·6
						(3 years)		
O ..	..	..	14 2·24	12 10·52	13 6·66	15 3·99	7·5	1 1·75
						(4 years)		
*Highest (to nearest penny)	15 6	16 3	16 11	18 0	20 10	23 4	50·5	7 10
*Lowest (to nearest penny)	6 6	7 0	6 10	6 8	8 5	10 6	61·6	4 0
*Mean (to nearest penny)	12 6	11 5	11 8	12 6	14 5	16 2	29·3	3 8

* Of the mines giving returns for six years.

It should be noted that though comparable *horizontally* or across the page in respect of different years at the same mine, the amounts in this table and subsequent similar tables are not exactly comparable *vertically* or down the page, because (1) the mines are at very different stages of development and of varying ages, (2) they are not all producing the same kind of coal, and (3) their financial years, to which the amounts relate, end at different dates, sometimes remote from one another.

In using this and similar tables the reader should bear in mind the note to the introduction, p. 2 above. Each mine or company is not indicated by the same letter throughout the tables—e.g., Mine A in one table may appear as Mine J in another. In some cases—e.g., where a company works two or more contiguous mines—a letter may refer to more than one mine, though such grouping is only occasionally made.

The average mining-cost per ton increased in every case except in the case of Mine A (the Point Elizabeth State Mine), where the cost fell 20 per cent., due to the fact that there was no development work to undertake, and the miners were mainly on pillar-work and with less travelling-distances, as the mine was nearing exhaustion. The lowest rate of increase, omitting Mine N, is 7½ per cent. (four-years' period only), and the highest 63·6 per cent. For those mines giving data for the whole period, including 1913, there is a wide range of change between the extreme limits of 8s. 3d. increase per ton and 2s. 3d. fall, equal to 10s. 6d. The rate of increase of the mine occupying the middle place is 50·2 per cent. The greatest increase is shown in the cost of producing brown coals.

The above table sets out the facts of mining-cost in respect of each mine or group of mines under one management, and indicates the nature and range of variation in each over the period, but it does not give a figure purporting to measure the increase in the cost of mining coal for the industry viewed as a whole. This may be calculated by weighting the average cost at each mine for each year by the output of the mine for the year, and so obtaining an average annual cost per ton for all mines. Calculation from the data available from the mines giving particulars of their costs over the whole period under review showed that the average cost of mining coal increased by over 37 per cent. comparing the years 1913 and 1918—i.e., from about 13s. 6d. to 18s. 7d. per ton. The cost in question, however, included the rail freight in the case of certain mines selling their coal f.o.b. at neighbouring ports. In order to arrive at the change in the true mining-cost these freight charges have been deducted, giving a result of 41-per-cent. increase in pure mining-cost, or from about 11s. 9d. per ton to about 16s. 7d. From these results and certain other evidence the Board is of opinion that *the total average cost of production per ton of coal at these mines has increased between 1913 and September, 1918, by about 40 per cent.* The cost of mining semi-bituminous coal has increased least, owing largely to the favourable position of the Point Elizabeth Mine, which is nearing exhaustion and working mainly on pillar coal, with shorter travelling-distances for the miners, and with little or no depreciation and taxation charges. The cost of mining both brown and bituminous coals has increased above the average rate of increase, the latter very slightly, the former very much above it. These mines are thoroughly representative of the industry as a whole during the period, except that their data gives an undue weight to increases in the cost of brown coal.

The largest proportionate increases in cost occurred during the two years 1916–17 and 1917–18. So far the comparison has been one of the cost of coals obtained from mines supplying cost data over the whole period 1913–18. *If we compare the costs of all coals for which exact particulars were available in each year, whether from collieries working over the whole period or not, the results are slightly different, though showing the same general character. On the average, judging from this data,* it cost about 31 per cent. more to mine coal in 1917–18 than in 1913, representing a change of from 11s. 9d. to 15s. 4d. per ton. This cost actually fell during 1913–16; in 1916–17 it rose 12 per cent. above that of 1913; and in 1917–18 it rose 31 per cent. more. One-third of the rise is due to increased labour-cost, as noted below. The cost of producing bituminous coal increased 40 per cent.; it did not rise till 1916–17, when it increased 17 per cent. The cost of mining semi-bituminous either decreased or remained much the same till 1917–18, when it rose 31 per cent. higher than in 1913. The cost of producing brown coal had risen 13 per cent. by 1916–17 and 25 per cent. by 1917–18. The total cost of production was highest throughout the period in the case of bituminous coal and lowest in the case of brown coal (except for one year). The labour-cost throughout was greatest in the case of brown coal; for three out of five years the labour-cost of producing bituminous coals was less than that of mining semi-bituminous coal.*

3. DIRECT LABOUR-COSTS.

Of the total cost a considerable percentage is represented by the wages of miners, truckers, other underground workers, and the surface workers about the mine. This cost may be referred to as the direct labour-cost. Table 17 gives the actual amounts paid per ton for such labour, and the percentage which such payment in each case is of the total cost of production. This is important as showing, among other things, how much of the value of a ton of coal goes as wages to manual labour employed directly in and about the mine.

TABLE 17.—TOTAL DIRECT LABOUR-COST PER TON OF COAL MINED, ALSO EXPRESSED AS PERCENTAGE OF TOTAL COST. (Total cost per ton for the purpose of this table does not include railway freights from mines to selling-point f.o.b. in this case, but includes all other costs, including administration, &c., for which companies have incurred actual charges.)

Mine.	1913.	1914.	1915.	1916.	1917.	1918.	Increase per Cent.	Increase.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.		s. d.
A	6 2·14	6 0·89	6 0·09	6 5·2	7 2·74	8 174	31·8	1 11·6
	47	44	45	51	43	40		
B	4 11	5 1·28	5 2·94	5 8·53	5 6·3	6 1·65	24·8	1 2·65
	38	37	40	41	33	30		
C	5 10·58	5 4	5 7·44	6 2·32	7 11	9 1·58	56	3 3
	59	61	62	61	65	69		
D	5 1·9	4 7·65	4 10·91	5 6·53	6 4·8	7 1·88	38·8	1 11·98
	52½	50	58	59	56	54		

* The defects in the data for 1913 are such as to raise unduly the figures of cost of that base year, and so diminish the number showing the percentage increase of cost over the period.

TABLE 17.—TOTAL DIRECT LABOUR-COST PER TON OF COAL MINED, ETC.—*continued*.

Mine.	1913.	1914.	1915.	1916.	1917.	1918.	Increase per Cent.	Increase.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.		s. d.
E	6 4-19 54½	6 0-61 46	5 8-95 52	5 1-37 54	5 6-81 61	5 8-85 63	10 (decrease)	0 7-34 (decrease)
F	5 8-92 59	..	..	..	..	7 4-32 43	28-2	1 7-4
G	4 9-9 42½	5 8-71 43	5 11-6 42	7 0-91 46	7 6-94 44	8 7-14 42	78-1	3 9-24
H	5 10 60	5 4 69	5 5 61	6 0 67	No details ..	8 2 71	40	2 4
I*	8 4-55 63½	8 1-87 63	8 5-96 56½	10 4-06 58	12 2-47 59	11 7-33 58½	38-5	3 2-78
J	5 1 79	5 4-75 77½	5 4-5 79	5 2-37 78¾	6 3-37 75½	7 8-25 73	51-25	2 7-25
K	..	..	..	6 3 44	6 8 43	6 6 36	4	0 3
L	..	..	6 0-79 51	5 9-25 53	6 2-03 54½	6 2-4 47	3	0 1-61
M	7 4-27 (1918 to Aug. 31)	5 8-23 63½	6 5-22 68	6 6-72 70	7 2-93 79	7 2-48 68½ (March 31)	27-3	1 8-04
N	..	..	..	5 3-32	5 6-73	6 3-37 56	19 (3 years)	1 0-05
O	..	4 1-4 50	4 1-7 53	4 5-7 52½	4 10-8 50½	5 6 51¾	33-6 (5 years)	1 4-6
P	..	9 5-74 59	11 7 56	11 0-7 63	10 2-8 58	15 0 65	58 (5 years)	5 6-26
†Highest (to nearest penny)	8 5	..	..	..	..	11 7	37-6	3 2
†Lowest (to nearest penny)	4 10	..	..	..	..	5 9	19	0 11
†Mean (to near- est penny)	5 10	..	..	..	..	8 2	40	2 4

* A railway charge of 3½d. to 7½d. a ton in the total cost has been ignored.

† Of the mines giving data for the six years.

It will be seen that the average direct labour-costs, with the exception of Mine E (Point Elizabeth), increased. *The lowest rate of increase is 3 per cent., and the highest 78·1 per cent.* There is considerable variation in the rate of increase when we compare mines even on the same field, or mines owned by the same company, the differences being due largely to the different stage of development of each mine. *The percentage which labour-cost is of total cost has increased considerably, except at Mine J, Mine I, and Mine L, at which it has decreased, and at Mine O, where it is about the same.* The percentage increase in labour-cost is less than the corresponding increase in total cost at nine mines out of fifteen.

TABLE 18.—INCREASE IN LABOUR-COST, OTHER COST, AND TOTAL COST PER TON OF MINING COAL, 1913-18.

Mine.	Increase in Labour-cost.		Increase in other Costs.	Increase in Total Cost.	
	Amount.	Per Cent.		Amount.	Per Cent.
	s. d.		s. d.	s. d.	
A	1 11-98	38-8	1 8-03	3 8-01	29-25
B	3 3	56	0 1-26 (decrease)	3 1-74	31-66
C	0 7-34 (decrease)	10 (decrease)	1 7-35 (decrease)	2 2-69 (decrease)	20
D	3 9-24	78-1	4 5-55	8 2-79	57-2
E	2 4	40	0 0-25 (decrease)	2 3-75	18-7
F (5 years) ..	1 6-25	26-7	0 0-85	1 7-1	18
G (3 years) ..	1 0-05	19	..	..	..
H (5 years) ..	1 4-6	33-6	0 9-2	2 2-8	26-7
I (5 years) ..	5 6-26	55	3 11-54	9 5-8	59
J	3 2-78	38-5	4 3-28	7 6-06	56
K	2 7-25	51-25	1 5-5	4 0-75	63
L	1 2-65	24-8	..	7 9-54	50-2
M (3 years) ..	0 3	4	0 10-6	1 1-6	6-6
N (4 years) ..	0 1-61	3	0 0-14	1 1-75	7-5
O	1 11-6	31-8	..	7 9-54	50-2
P	1 7-4	28-2	5 3-86	6 11-26	63-6

The figure which gives the closest measurement of the increase in the cost of the manual labour directly applied to the production of coal in and about the mines over the period 1913-18 is that obtained by weighting the average yearly labour-costs per ton at each mine according to the relative importance of the output of the mine in the total output and comparing the results. From the data provided by those mines giving particulars of labour-costs over the whole period it is clear that *the cost of the manual labour employed in and about these coal-mines increased during the period 1913-18 by 31 per cent.—i.e., from about 5s. 11d. to about 7s. 9d. per ton.* This result is in close agreement

with the results obtained by other methods, as, for example, by a comparison of the total yearly wages bill at each mine over the period with the output of the mine. The increase in labour-cost of the mines giving data over the whole period, both in absolute amount and in percentage rate, has been greatest in the case of brown coal, and lowest in respect of semi-bituminous coal. The increase in semi-bituminous is about 1s. a ton, or under 20 per cent.; in bituminous about 1s. 9d., or about 30 per cent.; and in brown coal over 3s., or nearly 50 per cent. In 1913 bituminous coal was subject to lower labour-cost per ton than semi-bituminous by a few pence, both averaging between 5s. 6d. and 6s.; in 1918 labour on bituminous was dearer by a few pence than that on semi-bituminous, each having increased to about 7s. 5d. and 7s. respectively. The difference in the labour-cost of bituminous and brown coals is now more than double what it was in 1913.

It would appear that of the average increase in the total mining-cost of all the mines giving data, from and including 1913 to September, 1918, that nearly 39 per cent. is due to increased direct labour-cost and a little more than 60 per cent. to increases in other costs than that of wage-labour employed at the mines.

When we take account of all coal concerning which we were able to obtain exact particulars of mining-cost, both from mines giving returns or operating over the whole period and from those which could provide such data only for part of the period, we find that the labour-cost in 1918 compared with that in 1913 shows an increase of about 20 per cent. The average labour-cost for 1914 was 4 per cent. less than for 1913; for 1916, about 4 per cent. more; for 1917, 14 per cent.; and for 1918, about 20 per cent. The labour-cost of bituminous coals from these mines increased on the average by about 28 per cent., or 1s. 7d. a ton. It was lower in 1914 than in 1913; in 1916 it was 8 per cent. higher than in 1913; in 1917, 16 per cent.; and in 1918 (to September), 28 per cent. Semi-bituminous coal increased in labour-cost from about 6s. to 8s. 2d., or 36 per cent., and brown coals about 13 per cent. The labour-cost of brown coal in 1918 was nearly 30 per cent. higher than the recorded 1914 cost. The comparatively low increase in brown coals between 1913 and 1918 is due to the fact that in 1913 no account was taken of those mines which were in an abnormal condition, and that in the subsequent years collieries have been opened up which contribute a fair proportion of the supply at a comparatively low cost.

On the average the increase in the labour-cost of all coals forming the subject of inquiry in any year, whether from mines operating throughout the period or not, is about 1s. 2d., or almost one-third of the increase in the total mining-costs.

In all these cases the averages are true averages obtained with due regard to the relative outputs of the respective collieries.

4. OTHER COSTS.

(i.) STORES AND MATERIALS.

The other elements in cost besides the direct payments to labour have also shown rises over the period. The facts in regard to the more important of them are summarized in the following tables and notes. Table 19 shows the cost, per ton of coal mined, for stores and materials at each of several principal collieries averaged over each year of the period under review, with the amount of increase or decrease, comparing the first and last years of the period for which returns were available in the case of each company. The highest and lowest cost for each year is stated at the foot of the table so as to give a clear idea of the range within which these costs vary from mine to mine. As in all other costs, such variation is caused mainly by differences, first in the natural conditions of the mines, including the nature of the coal itself, and, secondly, in the stage reached in the life of the mines, a new mine, for example, requiring to spend a much smaller (or a much larger) proportion of its total cost on certain given factors or work than an older mine.

TABLE 19.—INCREASES IN COST, CALCULATED PER TON OF OUTPUT, OF STORES AND MATERIALS (INCLUDING TIMBER), 1913–18.

Mine.	1913.		1914.		1915.		1916.		1917.		1918.		Increase or Decrease.
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	
A	0	11·75	0	10·96	0	10·88	0	11·02	1	0·19	1	2·26	0 2·51
B	0	6·88	0	7·97	0	6·75	0	8·11	0	9·02	0	9·75	0 2·87
C	..	..	0	10·87	1	0·73	1	0·48	2	0·13	2	4·08	1 5·21
D	0	7·56	0	5·2	0	5·5	0	7·11	0	9·22	0	9·75	0 2·19
E	..	..	..	..	..	..	0	8·6	1	2·4	1	3·3	0 6·7
F	..	..	0	6·96	0	7·68	0	7·57	0	8·57	0	11·02	0 4·06
G	0	11·83	0	11·44	0	10·28	0	9·45	0	9·08	0	9·84	0 1·99*
H (including renewals) ..	0	8·27	0	9·58	0	10·32	1	0·82	1	5·02	1	7·37	0 11·1
I	0	6·72	1	0·63	0	11·36	0	9·01	0	6·11	0	9·24	0 2·52†
J	1	3·05	1	0·675	1	5·19	1	3·05	..	..	..	..	..
K	..	..	..	..	..	..	..	..	..	..	1	5·55	..
L (and repairs)	..	..	0	10	0	6·7	0	6·9	0	8·9	0	11·4	0 1·4
M	..	..	0	9·75	0	9·64	0	6·32	1	0·99	1	8·65	0 10·9
N	1	3·96	1	1·21	1	1·61	2	2·9	2	10·57	2	11·95	1 7·99
Highest	1	3·96	1	1·21	1	5·19	2	2·9	2	10·57	2	11·95	1 7·99
Lowest	0	6·72	0	5·2	0	5·5	0	6·32	0	6·11	0	9·75	0 1·99*

* Decrease.

† Increase.

There is a wide range in the cost as between different collieries at the same time, the ratio of lowest to highest being not lower in any year after 1913 than 1 to 2½. The variation in the percentage increase over the period is accounted for by the fact that some companies had fortunately bought heavily for future delivery just before the outbreak of the war, or had heavy stocks on hand. The rise in the prices of materials used in mining has been very heavy. A table in Appendix C gives the prices of materials used at the State collieries from 1914 to 1918. These prices have increased 144 per cent. The prices paid for stores and materials for other large mines on the West Coast showed an increase of about 125 per cent., calculated on the cost at the central ports and not including the large rise in coastal freights and other final delivery charges. The prices quoted on the North and the South fields averaged about 200 per cent. increase. The range of change has been very wide, some materials in common use having quadrupled in price, others rising by as low as 25 per cent. The precise rise in cost per ton varies in part according to the degree to which the several mines had bought, whether heavily or not, just previous to the outbreak of war. The expenditure on stores and materials formed about 10 per cent. of the total mining-cost in the case of the mine with highest stores-cost per ton in 1913; in 1918 this expenditure at the same mine, still showing the highest figures in respect of this particular cost, was about 15 per cent. of total cost. The corresponding percentages in the case of the mine with lowest stores-cost are 4 and 2. Where materials have deteriorated in quality as well as risen in price, as in the case of explosives, the tendency to raise the cost of the coal produced per ton is increased. Some mines required a very much heavier expenditure on timber than others.

(ii.) MAINTENANCE AND RENEWALS.

Table 20 gives similar information in regard to the cost of maintenance and renewals.

TABLE 20.—COST OF MAINTENANCE AND RENEWALS PER TON OF COAL-OUTPUT, 1913-18.

Mine.					1913.	1914.	1915.	1916.	1917.	1918.	Increase or Decrease.
					s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
A	..	..	..	..	0 0-04	0 0-05	0 0-02	0 0-03	0 0-09	0 0-06	0 0-02
B	..	..	..	..	0 0-04	0 0-05	0 0-47	0 0-07	0 0-13	0 0-03	0 0-01*
C	..	..	..	..	1 2-69	0 11-10	0 9-78	1 1-84	1 9-45	3 0-13	1 9-44
D	..	..	..	..	1 1-64	0 9-26	0 6-11	0 11-31	0 4-33	0 2-80	0 10-84*
E	..	..	..	..	..	..	..	0 5-3	0 8-5	1 5-7	1 0-4
F	..	..	..	..	..	0 1-91	0 1-33	0 1-61	0 1-99	0 2-38	0 0-47
G	..	..	..	..	0 2-04	0 2-6	0 2-35	0 2-79	0 2-21	0 1-97	0 0-07*
H	..	..	..	..	0 1-21	0 0-24	0 0-86	0 3-97	0 5-88	1 2-63	1 1-42
I	..	..	..	..	..	..	..	..	..	..	..
J (including stores, freights, &c.)	..	..	..	..	..	1 6-66	1 3-03	0 9-99	0 6-71	1 8-38	0 1-72
K (including railway)	..	..	..	..	..	0 5	0 5-3	0 4-9	0 6	0 7	0 2
L	..	..	..	..	..	0 1-93	0 1-2	0 1-38	0 5-1	1 0	0 10-07
M	..	..	..	..	..	..	..	..	..	..	..
Highest	..	..	..	..	1 2-69	1 6-66	1 3-03	1 1-84	1 9-45	3 0-13	1 9-44
Lowest	..	..	..	..	0 0-04	0 0-05	0 0-02	0 0-03	0 0-09	0 0-03	0 10-84*

* Decrease.

There is a remarkably wide variation from mine to mine in maintenance and renewal cost per ton. The chief factors are the age of the mine and the general natural conditions, the latter exerting an even greater influence than the former. There has been on the whole a considerable increase in these costs over the period, due mainly to increased cost of materials and of labour. In the case of the mine with highest maintenance cost, the proportion which that cost formed of the total mining-costs in 1913 and 1918 was 10 per cent. and 18 per cent. respectively; in the case of the mine with lowest maintenance costs, the proportion is a very small fraction of 1 per cent. at each of these years.

(iii.) RATES AND TAXES.

The variation in the ratio of taxation to amount of output is shown in the following table:—

TABLE 21.—EXPENDITURE PER TON OF OUTPUT ON RATES AND TAXES, 1913-18.

Mine.					1913.		1914.		1915.		1916.		1917.		1918.		Increase or Decrease.	
					s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
A	..	..	..	..	0	3-19	0	4-62	0	5-29	0	9-51	1	3-9	2	0-66	1	9-47
B	..	..	..	..	0	3-39	0	1-98	0	3-87	0	2-62	0	8-94	0	8-15	0	4-76
C	..	..	..	..	0	1-6	0	1-47	0	2-17	0	3-12	0	6-51	0	7	0	5-4
D	..	..	..	..	..	..	..	..	..	..	0	0-5	0	0-5	0	0-4	0	0-1†
E*	..	..	..	..	..	..	..	..	0	2-37	0	2-31	0	2-09	0	2-27	0	0-1†
F*	..	..	..	..	0	2-15	0	2-18	0	2-33	0	1-89	0	1-91	0	1-95	0	0-2†
G	..	..	..	..	0	0-56	0	0-67	0	0-76	0	0-9	0	1-67	0	1-33	0	0-77
H (including insurance and rent)					0	3-36	0	5-37	0	7-06	0	3-71	0	4-56	1	1-87	0	10-51
I	..	..	..	..	0	6-875	0	4-25	0	4-81	0	9-575	..	..	..	..	0	2-7
J	..	..	..	..	..	..	0	1-82	0	1-81	0	1-81	0	0-83	0	2-51	0	0-69
K	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	6-9	..	..
L	..	..	..	..	..	..	0	4-4	0	7-7	0	10-6	1	0-9	0	11-7	0	7-3
M	..	..	..	..	..	..	0	0-56	..	..	..	..	..	..	..	..	..	..
N	..	..	..	..	0	2-59	0	3-17	0	5-61	0	8-79	0	8-8	1	1-48	0	10-89
O	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..
Highest					0	6-875	0	5-37	0	7-7	0	10-6	1	3-9	1	6-9	1	9-47
Lowest					0	0-56	0	0-56	0	0-76	0	0-5	0	0-5	0	0-4	0	0-2†

* State mines.

† Decrease.

The expenditure on rates and taxes on the production of coal has increased considerably during the war period, between fourfold and fivefold, if account is taken of the widely varying total amounts paid by the different collieries. The taxation charge on the average accounts for from 6 to 7 per cent. of the total cost of mining coal. In the case of the company with the highest tax-cost in 1913, taxation represented 5 per cent. of total cost; in the corresponding case for 1918, 14 per cent. Part of the taxation charge is levied on income which varies greatly, and part on capital values which are not subject to such rapid variations as income.

(iv.) ADMINISTRATION.

This is the cost of management in the widest sense of the term, and includes office and clerical charges.

TABLE 22.—COST OF ADMINISTRATION, 1913-18, PER TON OF COAL-OUTPUT.

Mine.				1913.	1914.	1915.	1916.	1917.	1918.	Increase or Decrease.
				s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
A	..	..	..	0 2-05	0 3-1	0 2-36	0 2-78	0 3-59	0 4-49	0 2-44
B	..	..	..	1 1-09	0 10-11	0 8-65	0 8-44	0 7-57	0 6-92	0 6-17†
C	..	..	..	0 9-91	0 7-34	0 7-71	0 8-09	1 1-18	0 11-81	0 1-9
D	..	..	..	..	..	..	0 6-4	0 7-8	0 6-8	0 0-4
E*	..	..	..	..	..	1 1-38	0 4-39	0 8-99	1 0-64	0 0-74†
F*	..	..	..	1 7-07	1 1-76	0 9-53	0 5-61	0 6-26	0 7-81	0 11-26†
G	..	..	..	0 9-19	0 9-21	0 10-99	0 6-3	0 8-09	1 10-4	1 1-21
H	..	..	..	0 4-63	0 5-94	0 4-49	0 4-02	0 5-37	0 6-02	0 1-39
I	..	..	..	0 7	0 8	0 7-7	0 7-125	..	..	0 0-125
J	..	..	..	..	0 1-81	0 2-03	0 2-06	0 2-33	0 2-1	0 0-29
K	..	..	..	..	..	..	..	..	1 0-1	..
L	..	..	..	..	0 6-4	0 3-7	0 4-4	0 4-6	0 5-4	0 1†
M	..	..	..	..	0 9-13	1 9	0 8	0 6-36	0 5-27	0 3-86†
N	..	..	..	0 11	0 11-76	0 11-86	1 3-16	1 2-01	1 1-12	0 2-12
O	..	..	..	..	..	..	..	..	..	..
Highest	..	..	..	1 7-07	1 1-76	1 9	1 3-16	1 2-01	1 10-4	1 1-21
Lowest	..	..	..	0 2-05	0 3-1	0 2-03	0 2-78	0 2-33	0 2-1	0 11-26†

* State mines. † Decrease.

This particular charge shows only a small average increase, despite the falling off in output, which would tend to increase the cost per ton of administration in common with all standing charges. The companies have evidently exercised economy in respect of these costs. In 1913 the highest charge formed about 11 per cent. of the total mining-cost of the coal in question; the corresponding figure for 1918 is about 10 per cent.; the corresponding percentages for the mines with the lowest cost are under 1 per cent. for 1913 and 1½ per cent. for 1918. The wide range between highest and lowest cost in the above table is due in part to difference of custom as to the contents of administration charges among some of the companies. The high administration charges of the State mines are due partly to the inclusion of hulk-costs in this item.

(v.) ROYALTIES AND RENTS.

TABLE 23.—EXPENDITURE ON ROYALTIES PER TON, 1913-18, OF TOTAL OUTPUT.

Mine.				1913.	1914.	1915.	1916.	1917.	1918.	Increase or Decrease.
				s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
A1	..	..	..	0 6	0 6	0 6	0 6	0 6	0 6	..
A2	..	..	..	0 6	0 6	0 6	0 6	0 6	0 6	..
B (including relief)	..	..	..	0 6-5	0 6-52	0 6-42	0 6-8	0 6-53	0 6-4	0 0-1†
C	..	..	..	0 6	0 6	0 6	0 6	0 6	0 6	..
D	..	..	..	..	..	..	0 6	0 6	0 6	..
F*	..	..	..	..	0 3-7	0 1-52	0 1-35	0 1-28	0 2-28	0 1-42†
G	..	..	..	0 4-73	0 5-02	0 4-63	0 3-95	0 4-51	0 5-4	0 0-67
H	..	..	..	0 5-6	0 2-56	0 1-81	0 1-51	0 4-4	..	0 2-93
I	..	..	..	0 2-55	0 1-05	0 2-25	0 0-925	..	0 8-53	0 1-635†
J (including rent)	..	..	..	..	0 6-52	0 6-58	0 5-08	0 6-56	0 5-92	0 0-6†
K	..	..	..	..	..	..	..	..	0 7-5	..
L	..	..	..	..	0 7-8	0 6-8	0 7-3	0 8-2	0 8-2	0 0-4
M	..	..	..	..	0 10-4	0 9-8	0 6-2	0 5-05	0 6	0 4-48†
N	..	..	..	0 4-28	0 4-44	0 4-34	0 4-36	0 4	0 4-26	0 0-02†
O	..	..	..	0 6	0 6	0 6	0 6	0 6	0 6	..
Highest	..	..	..	0 6-5	0 10-4	0 9-8	0 7-3	0 8-2	1 0	0 2-93
Lowest	..	..	..	0 2-55	0 3-7	0 1-52	0 0-925	0 4	0 5-4	0 4-4†

* State mine. † Decrease.

The range of change is nearly 7½d. a ton. The change is due in some cases to variations in the proportions of coal mined by a company from its freehold and its leasehold; in others to the merging of rents into royalties; in others to the taking-up of new leases. Royalty accounted for 2½ per cent. of the total mining-cost of the company with the highest royalty charge in 1913, and 4 per cent. of the similar cost in 1918; the corresponding percentages for lowest royalty are 1½ and 2½.

(vi) DEPRECIATION AND SINKING-FUND CHARGES.

TABLE 24.—EXPENDITURE PER TON OUTPUT ON DEPRECIATION AND SINKING FUNDS OF COAL-MINES, 1913-18.

Mine.				1913.		1914.		1915.		1916.		1917.		1918.		Increase or Decrease.	
				s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
A	..	..	..	0	9·93	0	10·32	0	10·27	0	9·82	1	0·88	1	6·69	0	8·76
B	..	..	..	0	11·2	1	0·84	0	6·41	0	6·77	0	4·32	..	..	0	11·20
C	..	..	..	0	1·34	0	5·63	0	3·72	0	1·03	0	1·51	0	1·47	0	0·13
D	..	..	..	..	..	..	..	..	..	0	5·6	0	5·5	0	4·3	0	1·3†
E*	..	..	..	..	..	..	..	1	10·82	1	7·49	1	3·95	2	7·23	0	8·41
F*	..	..	..	1	2·31	1	8·99	1	8·03	1	2	0	4·95	0	0·29	1	2·02†
G	..	..	..	0	7·13	..	..	..	..	..	..	..	..	..	..	0	7·13†
H	..	..	..	0	6·04	0	3·54	0	8·28	0	7·64	1	2·35	0	11·37	0	5·33
I	..	..	..	..	..	0	7·18	0	6·23	..	..	..	..	0	5·11	0	2·07†
J	..	..	..	..	..	0	11·2	0	6·5	0	7·6	0	8·8	0	9	0	2·2†
K	..	..	..	..	..	0	6·2	0	9·85	0	7·15	0	5·22	0	8·3	0	2·1
												(Feb., 1918)	(Feb.-Aug., 1918)				
L	..	..	..	..	..	..	..	..	..	..	..	0	5·78	0	4·86	0	4·86
Highest	..	..	..	1	2·31	1	8·99	1	10·82	1	7·49	1	3·95	2	7·23	0	8·76
Lowest	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2·02†

* State mines. † Decrease.

Comparison of the figures given in the above table is rendered almost impossible by the fact that the companies make provision for depreciation only as the condition of their balances allow, and seldom follow any other fixed principle in assessing this allowance. There have been decreases during the period in respect of some collieries, but this, except in one case, does not imply that the cost is actually decreasing, but only that it has not been fully allowed for. The highest costs are in the case of the State mines, where adequate allowances have been made.

5. RELATION OF LOST TIME TO COST OF PRODUCTION AND OUTPUT.

(i.) CLASSIFICATION OF LOST TIME.

Among the causes of both the *high* cost of production and the *increase* in that cost during the period a prominent place was assigned by some of the mine owners and managers to the amount of time voluntarily lost by the miners. If such lost time could be diminished there would be not only a lower cost per ton, but a greater output, both results tending to lower the price of coal to the consumer. The cost of production per ton falls the nearer the full working-limit of a mine is reached. If all the working-places were fully manned at every shift worked by the mine the cost of production per ton would approach the minimum possible at that time, since all standing charges would be spread over the maximum possible output. Conversely, the further the departure from the limit of full working the higher the per ton mining-cost. The average number of shifts worked (or lost) per miner per week is therefore an important factor in determining the cost of production. In this connection it is necessary to draw certain distinctions. There is, in the first place, the number of shifts (or days) per year worked by the mine. This varies from time to time, as well as from mine to mine, according to such factors as weather (particularly in localities subject to floods and those dependent upon bar harbours for shipping-facilities) and the degree of industrial peace or unrest. When a mine is "idle" only certain shift-men are employed in and about it. In the next place, there is the average number of shifts worked per week by the miner expressed as a percentage of the number of shifts worked by the mine itself. In regard to this latter figure we must further distinguish between the absolute amount of time lost—i.e., the difference between the number of times the mine was open and the average number of shifts worked per miner—and any increase or decrease in that amount during the war period, since a certain amount of absence may be a necessary condition of the miner's health and maximum efficiency, and that amount may not have been realized at a given time within the period.

(ii.) AVERAGE PERCENTAGE OF POSSIBLE SHIFTS LOST BY MINERS.

General statements in evidence assessed the time lost by miners at about 10 per cent. of the possible working-time, and alleged that it had shown an increasing tendency during war-time. Analysis of the mine-records supported these statements in many cases, though in some the position showed improvement since 1914. At one large mine the percentage of time lost had nearly doubled between 1913 and 1918, as shown in the following table:—

TABLE 25.

Year.	Percentage of Possible Shifts worked.	Percentage lost.	Lost by Accident.	Lost otherwise.	Remarks.
1913-14	93·38	6·61	4·47	2·13	Omitting strike-time.
1917-18	90·45	9·54	5·36	4·17	..
To 31st March, 1918 ..	90·07	9·91	4·41	5·49	..
April to August, 1918 ..	87·69	12·30	4·38	7·87	Equal to about 7,000 tons of coal.

At another large colliery on the same field during the year ending 26th April, 1918, over 10 per cent. of the possible working-time was lost through causes other than reported accidents and sickness, and it was stated that the miners could have increased their actual weekly earnings from £4 1s. 8d. to £4 17s. 2d. by working full time during the three months ending at that date.

At two other large collieries in another part of the Dominion the position had improved. At one of these the average number of shifts worked per week per man was as follows:—

TABLE 26.						1914.	1918.
Miners	..	..	..	..	..	4½	5½
Truckers	..	..	..	..	..	5	5½
Surface shift-men	..	..	..	..	..	5½	5½
Underground shift-men	..	..	..	..	..	5½	6½
Possible (for miners)	..	..	..	..	..	5	5½

This represents a slightly higher percentage of attendance of miners even though the maximum length of the working-week had been increased. At the other colliery there was, said the owners, "little cause to complain" of lost time on the part of the miners; for the shifts worked during the fortnight preceding our visit the percentage of lost time was 6¼.

At another field the percentage of shifts lost in the principal mine during the preceding twelve months was 9¼; not quite 3 per cent. of the men were absent on each working-day.

Three mines on another field recorded the following data: At one the mine was idle 15 shifts out of 274 possible shifts in 1914, and for nine months of 1918 16 out of 213 possible. When the mine was working the percentage of shifts lost by the men was 4 in 1914 and 6 in 1918. At the second mine the average time lost per miner was reduced from 1·15 shifts to 1·12 per fortnight, and in the other there was a very slight increase of lost time from 0·9 to 0·94 shifts per fortnight.

Two mines in another field both show a reduction in the average number of shifts worked per week by the miner—in the one case from 5 to 4¾, and in the other from 4½ to 4.

In all cases the truckers and underground and surface shift-men show a higher number of shifts worked per week than the miner, and, comparing the earlier part of the period 1913–18 with the later, they often show an increase in the average number of shifts worked per man per week when the miner shows a decrease, as, for example, in the following case:—

TABLE 27.						—Shifts per Week.—	
						1913–14.	1917–18.
Miners	..	..	..	..	..	4·5	4·0
Truckers	..	..	..	..	..	4·56	4·87
Shift-men	..	..	..	..	..	5·98	6·08

At another field two of the four chief mines show a slight decrease in the amount of time worked by miners per working-week over the period 1913–18. The two other mines show a decrease up to the early part of 1917, and an increase afterwards.

(iii.) TIME LOST BY MINES.

The time during which mines have been idle has in several cases formed a serious proportion of the total time they could have worked. A valuable analysis has been prepared of the number of days that the State mines at Point Elizabeth and Rewanui could have worked, the number of days worked, and the causes of the cessation of work. The return covers the period April, 1913, to September, 1918, for Point Elizabeth, and April, 1915, to September, 1918, for the Liverpool Mine. The time lost through pay-Saturdays, holidays, and the cavilling-time has not been included in the possible working-time as defined in the return. The Point Elizabeth Mine stood idle during 13·3 per cent. of its possible working-time, the Liverpool Mine 17·3 per cent. The following shows the number of days the mines stood idle owing to each particular cause:—

TABLE 28.						Number of Days idle, 1913–18.		
Cause.						Point Elizabeth.	Both Mines.	
Strikes	..	..	..	..	..	109		146
Lack of shipping	..	..	..	..	..	48		108
Harbour unworkable	..	..	..	..	..	34		59
Slips	..	..	..	..	..	3		38½
Floods	..	..	..	..	..	1		4
Miscellaneous	..	..	..	..	..	2½		5½
Total	..	..	..	..	..	197½		361
Number of days mine could have worked, excluding union holidays, pay-Saturdays, and cavils						Point Elizabeth. 1,488½	Both Mines. 2,432½	Liverpool. 944
Percentage of time lost by mine						13·3	14·9	17·3

The number of holidays at both mines during the period was 125, of pay-Saturdays 235, and of days lost through cavils $11\frac{1}{2}$, totalling $371\frac{1}{2}$ days.

The number of days worked each year by the mines is as follows :—

TABLE 29.						Point Elizabeth.	Liverpool.
Year.							
1913-14 (31st March)	..	..	..	..	..	216	..
1914-15 ..	..	..	..	..	..	246	..
1915-16 ..	..	..	..	..	..	237	222
1916-17 ..	..	..	..	..	..	256	$262\frac{1}{2}$
1917-18 ..	..	..	..	..	..	219	$197\frac{1}{2}$
Annual average ..	..	..	..	..	..	235	227
Half-year to 30th September, 1918 ..	..	..	..	..	..	117	$98\frac{1}{2}$

The Board obtained particulars of the number of days annually worked by several important mines from 1908 inclusive. Some mines have been open for work for 10 per cent. more time per year over the war period than for the six years preceding 1914, and others have had a shorter working-year than before the war. There has been an increase on the whole, but it would not average more than 5 per cent. for the Dominion.

(iv.) CHANGES AND CAUSES.

The proportion of full working-time (excluding holidays, pay-Saturdays, and days the mine is idle) worked by the average miner may be estimated at a little over 90 per cent. for the earlier part of the period. During the period it has decreased at some mines and increased at others, the net result being a slight decrease in the average attendance. At one large mine the number of shifts worked per week per miner is the same in 1918 as in 1914; at another neighbouring large mine it has increased by one-eighth. In the case of two other large mines, each on different fields, it has also increased by half a shift and by three-eighths of a shift, even though in both cases the number of shifts annually worked by the mines has also increased. In the case of five other large mines the average weekly attendance has fallen off by one-tenth, one-sixth, one-quarter, one-third, and one-half a shift. If we take into account the relative numbers of men employed, and the change in the number of days worked in the year at each colliery, the decrease in the average time worked by miners during the year over the whole Dominion cannot have been considerable between 1913 and 1918.

The explanation of any reduction that exists is to be found in the increase in the average earnings of the miner, and in the greater force exerted during the period by those causes which bring about any absence from work at all. An increase in money earnings tends of itself to make the miner shorten his working-time, until he may be forced to realize that the increased earnings are offset by a rise in his expenditure. The nature of a miner's work is such that he sets a higher value on leisure than the ordinary worker, and, after a certain point is reached in his income, he is prepared to forgo further earnings in return for an addition to its enjoyment, which implies a considerable rise in his standard of comfort. The use he will make of this additional leisure, and its ethical value to the community as a whole, will depend upon his temperament, education, and the general environment society has provided for him. The late Lord Rhondda, writing in 1903 on "The Growth and Direction of our Foreign Trade in Coal," generalizes thus from his own research: "There is a very human disposition on the part of the collier, not unknown among those in other walks of life, to take life easier as income improves." He then proceeds to quote statistics showing how, as the value of the coal rose, the annual output per person employed overground and underground fell, and conversely. (*Journal of the Royal Statistical Society*, 1903, pp. 482-83). In New Zealand the output per person employed underground, as calculated by the Mines Department, varied to the following extent for the period under review :—

TABLE 32.						Tons.	Increase or Decrease per Cent. on Preceding Year.
1913	..	..	..	..	..	590	..
1914	..	..	..	..	..	639	8.3 increase.
1915	..	..	..	..	..	711	11.3 „
1916	..	..	..	..	..	750	5.2 „
1917	..	..	..	..	..	715	4.7 decrease.
1918	..	..	..	..	..	703	1.7 „

Comparing 1917 and 1918 with 1913 there is an increase of 21.2 per cent. and 19.2 per cent. respectively in the output per man employed underground. For reasons stated in detail in Chapter V, statistics of output cannot be accepted as a measure of the percentage of possible time worked by the miner, but where increase in output accompanies a decrease in such percentage it cannot be justly argued that the latter in itself is an evil. The following comparison of output per miner per shift is calculated from returns furnished by companies :—

TABLE 33.—OUTPUT IN TONS PER MINER PER SHIFT WORKED.

Mine.						1913-14.	1917-18.	Increase.	Decrease.
								Cwt.	Cwt.
A	..	..	..	..	..	7.55½	7.55	..	..
B	..	..	..	..	..	5.6½	6.75	23	..
C	..	..	..	..	..	5.95	5.6	..	7
D	..	..	..	..	..	5.78	5.47	..	6
E	..	..	..	..	..	..	6.39	..	..
F	..	..	..	..	..	6.55	6.88	7	..
G	..	..	..	..	..	6.95	7.81	17	..
H	..	..	..	..	..	7.09	8.23	22	..
I	..	..	..	..	..	6.23 (1915-16)	7.92	34	..
J	..	..	..	..	..	5.5	5.25	..	5
K	..	..	..	..	..	4.38	4.25	..	2½
L	..	..	..	..	..	4.7	5.1	8	..
Unweighted average						6.015	6.43	8½	..

It is clear that increased output per miner per shift has in general been associated (though not necessarily as cause and effect) with any tendency to increased voluntary absence from work that may exist.

An appreciable degree of voluntary absence is a feature associated with coal-mining in all countries. It is a tradition or custom deeply rooted in the peculiar nature of the occupation, where men work deep underground for wages at a rate high enough to allow of a tolerable standard of comfort without incessant labour. It is, in our opinion, a result of the strain and disagreeableness of the work itself, and the opportunity for a certain amount of leisure offered by the comparatively high wages. Hotels, gambling, and races are not so much the causes of absenteeism as conditions favouring the easy operation of the real causes, and influencing a certain section of the mining population to spend their leisure in certain ways rather than in others. The misuse of leisure is as great among the general population as amongst miners as a body if we take account of differences in environment and the opportunities of using leisure. In a few mining-fields, where alternative methods of spending leisure are few, the prohibition of alcoholic liquors or horse-racing would probably lead to a slightly higher percentage of possible time being worked; but the average miner is convinced that he works sufficiently long and sufficiently hard, having due regard to his health and efficiency. Any considerable improvement in annual output per man must be looked for as the result of better training of the worker, better organization of labour within and without the mines, and a more intensive application of capital in the shape of machinery, &c., rather than from an extension of the number of shifts worked per year by the miner.

The amount of time lost per man per fortnight (eleven shifts) at the two largest mines in the Dominion during the year ending May, 1918, averaged 1.08 days in the one case for hewers, shift-men, truckers, and horse-drivers, and 1.99 days in the other for hewers, 1.12 for truckers and horse-drivers, and 1.32 for shift-men. At one mine 0.37 and at the other 0.38 days were lost during the three days immediately following pay-Saturday. As already indicated in Chapter I, section 5 (vii), however, figures of this nature afford no measure of the degree of absence through drink. The consumption of alcohol at certain mining settlements for which data was obtainable may be estimated approximately for the period 1913-18, averaged over the total population, as over 20 gallons of ale and beer per year, and a little under one case of wines and spirits. This is more than 100 per cent. higher than the corresponding consumption of the general population of the Dominion for the same period. But intemperance in mining communities, as among the general population, is confined to a certain section. With rising wages this section has undoubtedly spent more money of recent years on drink, and at the same time has been able to afford more time off.

Other causes of absence cannot be said to have shown any special change in their force during the war period. Accident and illness do not appear to have varied from the normal sufficiently to have caused any pronounced tendency to increased absence. The provisions of the Workers' Compensation Act that if incapacity from injury lasts less than seven days no compensation is payable, and that if it lasts less than fourteen days no compensation is payable in respect of the first seven days, were the subject of general complaint by mine owners and managers as tending to increase the time off in connection with minor injuries. This law dates from a time long before 1914, and, though it probably accounts for a part of the time voluntarily lost through injury, it cannot have had any effect in changing the amount of that time within the war period.

CHAPTER III.

THE COST OF DISTRIBUTION OF COAL.

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1. TRANSPORT FROM MINE TO DEALER.

(i.) RELATION OF THE AMOUNT OF TRANSPORT CHARGES TO THE RETAIL PRICE OF COAL.

THE New Zealand coal-mines are more or less remote from the chief consuming-centres. The cost of transportation by rail or sea is therefore an important item in the cost of coal to the consumer, and is the first in order of the costs of distribution. For example, in the case of Taupiri house coal the cost of transport puts 40 per cent. on to the selling-price f.o.r. at the mine (September, 1918), and represents 23 per cent. of the net cost of coal to the consumer at Auckland. In the case of Westport house coal at Lyttelton sea freight adds 46 per cent. to the f.o.b. cost at Westport, and railage from Lyttelton to Christchurch another 20 per cent. ; while the sea freight represents 19 per cent., and the rail charges, including the railage from mine to Westport, over 13 per cent., of the net retail price at Christchurch. (In the latter case the rail freight from Lyttelton to Christchurch is over 42 per cent. of the sea freight from Westport to Lyttelton.) The Newcastle mine price (15s.) is increased by 110 per cent. by the sea carriage (16s. 6d.) to Lyttelton (133½ per cent. after 1st March, 1919) ; the railage to Christchurch (5s. 6d., or one-third of the cost Newcastle to Lyttelton) represents nearly 37 per cent. of the mine price ; and nearly 10 per cent. of the retail price at Christchurch (£2 17s.) is accounted for by this railage, and 29 per cent. by the sea freight.

The following table shows the relation which cost of carriage bears (1) to the cost of the coal as it leaves the principal minefields, and (2) to its cost to the consumer. In each case the figures have been calculated on net price per ton ; the transport in question is carriage by rail or sea, and does not include cartage of coal from ship or truck to dealers' yards, which will be considered under another heading.

TABLE 34.—SHOWING RELATION BETWEEN COST OF TRANSPORT BY RAIL OR SEA AND THE NET RETAIL PRICE OF CERTAIN HOUSEHOLD COALS.

Freight between	Percentage added to Mine-cost* by Freight.	Percentage which Freight is of Net Retail Price.
Newcastle and Lyttelton ..	110	29 (Christchurch price).
Newcastle and Christchurch ..	147	39
Newcastle and Wellington ..	110	32
Taupiri and Auckland ..	40	23
Taupiri and Wellington ..	77	29
Westport and Lyttelton ..	46	19 (Christchurch price).
Westport and Christchurch ..	65	27½
Kaitangata and Dunedin ..	22½	15
Kaitangata and Christchurch ..	47½	24½
Nightcaps and Invercargill ..	35½	18½
Greymouth (other than State) and Lyttelton ..	39	19 (Christchurch price).
Greymouth (other than State) and Christchurch ..	56	27½

* In the case of Westport and Greymouth mine-cost includes railage charges of from 2s. 3d. to 3s. from mine to port.

In the case of certain coals the total transport charges are greater than those shown in the statistics of freight as usually quoted, since there are certain haulage costs borne by the coal company from the pit-mouth to the point f.o.b. or f.o.r. The following table gives the more important cases in which these extra costs occur :—

TABLE 35.—COST OF RAILWAY HAULAGE TO NEAREST PORT OF SHIPMENT PER TON OF COAL MINED OVER A RECENT PERIOD.

	s.	d.
Point Elizabeth to Greymouth	2	3
Liverpool Mine	2	7
Blackball	3	0 $\frac{1}{4}$
Paparoa	3	4
Denniston (Conn's Creek) to Westport	2	8
Granity to Westport	3	0
Ngakawau to Westport	3	0

These rail-costs represent a range of from 16 to 27 per cent. of the total mining-cost of the coal at the shipping-ports, and do not include the Harbour Board charge of 3d. per ton, which is made in some cases to assist in the upkeep of the railways and harbours.

It is clear that the railway and shipping charges contribute a large proportion of the cost of coal, and that improvements in transport economizing these costs would be important factors in reducing its price. Such improvements might be effected in—(1) The mechanics of transport; (2) the present system of ownership, administration, and general organization of the railways and shipping; and (3) methods of handling the coal whilst *en route*, including loading and discharging.

The possibility of immediate improvements in these directions is referred to in Chapter VIII.

(ii.) CHANGES IN TRANSPORT-COSTS SINCE 1913.

The freight charges have increased during the war period. The *increase in rail freights* can be definitely measured, and *amounts to 21 per cent.*, made up of two rises of 10 per cent.—on the 19th September, 1915, and the 25th November, 1917, respectively. The general increase in shipping rates cannot be so definitely measured in percentages because of the unequal distribution, over the various routes, of the particular increases. For example, the contract rates for the carriage of coal in the New Zealand coastal trade were advanced for all ports in 1916 and 1917 by a common rise of 1s. 6d. and 2s. 6d. respectively. *The percentage increases in shipping freights for coal*, calculated from the rates for the chief ports of discharge, *show themselves to be as detailed below* :—

- (a.) The increase in freight rates on Newcastle coal between 1914 and November, 1918, amounted on the average to 52 per cent. to all New Zealand ports, the rises occurring in 1916, January, 1917, June, 1917, and in 1918. (A rise of 3s. 6d. per ton, or 21·2 per cent., on rates to the chief ports takes effect from the 1st March, 1919.) The rises in the freights charged by lines other than the Union Company have been greater.
- (b.) The average increase in the freight rates on Westport coal amounted to 55 $\frac{1}{2}$ per cent. Two changes were made, on the 1st July, 1916, and the 1st July, 1917.
- (c.) The corresponding average increase for Westport-Stockton coal is 53 $\frac{1}{4}$ per cent., the rises occurring on the 1st November, 1916, and the 1st November, 1917.
- (d.) The average increase in the freight rate on State coal amounted to 42 per cent., increases being made on the 1st June, 1916, and the 1st December, 1917. Only small increases were made in the case of Auckland and Napier. For other ports the percentage of rises was much the same as on other coals.

The difference between the rate of increase of the cost of transport by rail and that of carriage by sea is well illustrated by a comparison of the Huntly-Auckland and Westport-Lyttelton charges. The railage from Huntly to Auckland for 1914-15 was 6s. 6d. per ton, or 39 $\frac{1}{2}$ per cent. of the mine-cost and 19 $\frac{1}{2}$ per cent. of the Auckland retail price. The freight from Westport to Lyttelton at the same period was exactly the same—namely, 6s. 6d., or 35 per cent. of the f.o.b. Westport cost and 16 $\frac{1}{2}$ per cent. of the retail price at Christchurch. At the present time the Huntly-Auckland railage is 7s. 11d., an increase of 21 per cent., adding 40 per cent. to the mine-cost and being 23 per cent. of the price paid by the consumer. The Westport-Lyttelton freight is 10s. 6d., an increase of 61 $\frac{1}{2}$ per cent., adding 46 per cent. to the present f.o.b. cost and constituting 19 per cent. of the retail price.

The *increase in sea freights has been caused by* the following increases in the cost to the shipowner :—

- Bunker coal (Newcastle) increased 36 $\frac{1}{2}$ (screened) to 57 per cent. (small).
- Bunker coal (West Coast) increased 22 (unscreened Westport) to 86 per cent. (State small).
- Wages increased just under 40 per cent.
- Victualling increased 60 per cent.
- Stores increased from 50 to 100 per cent.
- Labour of working the ship increased 70 per cent.

From the particulars supplied us in respect of typical colliers engaged in the New Zealand coal trade we find that the average cost per ton to the shipowner for the carriage of coal increased from about 5s. for the year ending 30th September, 1914, to about 7s. 6d. for the year ending 30th September, 1917, equivalent to an increase of 50 per cent. The level of freight rates is, of course, determined also by the conditions of demand for shipping, and this demand during the war period has increased enormously. This factor is referred to in considering the reasonableness of profits. (See Chapter IV, section 2 (i).)

The main conclusion in regard to this section of the inquiry is that there has been, during the war period, a considerable increase in the cost of carriage of coal by land and sea, but greater in the latter case. Whilst the railway freight has increased on all routes by 21 per cent., marine freight has risen by amounts bearing different ratios to the original charge when we compare the various routes. These amounts, with the percentage rises in regard to the West Coast and Australian coal traffic of the four chief centres, are set out in the following table. Wherever steamers other than those of the Union Steamship Company were used the freights were higher.

TABLE 36.—ORDINARY SHIPPING FREIGHT PER TON OF COAL.

From			To	1914.	1918.	Increase.
				s. d.	s. d.	Per Cent.
Westport and Greymouth	..	..	Wellington	5 7	9 7	72
"	..	..	Lyttelton	6 6	10 6	61
"	..	..	Dunedin	7 6	11 6	54
Newcastle	..	..	Auckland	10 3	16 3	59
"	..	..	Wellington and Lyttelton	10 6	16 6	57
"	..	..	Dunedin	12 6	18 6	48

The percentage increase in the total transport charges is, of course, less than those in marine freight. In the case of the trade from Newcastle Wharf to Christchurch Railway-station the increase is 44 per cent., and of the carriage between the Denniston Mine, near Westport, and Christchurch Railway-station it is 42 per cent.

2. DISTRIBUTION-COSTS FROM DEALER TO CONSUMER.

(i.) DEFINITION AND CLASSIFICATION OF SUCH COSTS.

The cost of distribution, other than freight and railage from mine to dealer's yard, consists generally of siding and yard rents, wages of hands employed in unloading, weighing, screening, and bagging at sidings or yards, cartage to yard or consumer or both, depreciation on plant, office expenses (clerical, telephone, insurance, rates and taxes, rent of office, &c.), salary of manager (whether owner or not). These costs have been estimated per ton, and in some cases the amounts set down may be accepted as accurate, it having been possible to work them out from the actual records; but in many cases they are estimates formed on the owner's intimate knowledge of his business, which generally comprises more than coal-dealing, the labour and plant used in the coal trade being also constantly used in other lines which bear part of their costs.

The difference in the estimates given in evidence at the same centre is largely explained by the difference in the circumstances of individual businesses. In particular, the cost per ton varies with the amount of trade done, since the standing charges per ton are much less in a large business than in a small one; they vary, too, with the length of the average run for delivery to the consumer. In some estimates also there is no allowance for depreciation or expenses of management, and where the dealer owns his buildings the rent charge, though legitimate, may be omitted. The efficiency and economy of operating a business vary, of course, also with the personality of the manager or owner.

In selecting estimates for the purpose of arriving at our conclusions we have endeavoured to choose those of firms that may be regarded as truly representative of the general conditions of the industry as it is carried on at present.

(ii.) DISTRIBUTION AT AUCKLAND.

(a.) *General Features.*—Auckland draws its supplies of coal from the North Auckland, Waikato, West Coast, and Newcastle mines. Since the coal from North Auckland is used mainly for steam purposes, that from the West Coast for steam and gas, and the main portion of the diminishing Newcastle supply is for railway and industrial uses, the household demand is provided for almost exclusively by the Waikato lignite-mines at Huntly, Rotowaro, Pukemiro, and Waipa, at distances ranging from sixty-five to eighty miles from Auckland Railway-station.

The Waikato lignite is the main class of coal handled by the members of the Auckland Coal-dealers' Association and other local coal-dealers. The coal is sold by the mine to the dealers, wholesale or retail, f.o.r. and loose in the trucks at the railage-point, railage being generally paid by the dealers. The mines sell—without prejudice to their regular customers—to any one requiring at least a truck of coal, whether he be a member of a coal-dealers' association or not. The greater part of the coal is sold to a comparatively small number of merchants, who do both wholesale and retail business, supplying both dealers and consumers directly, though there are dealers who buy straight from the mine without any intermediate merchant. The merchants and many of the dealers have sidings and sheds at which the coal is weighed and bagged from the truck, after the removal of the dross (twelve bags to the ton), stacked on platforms, and delivered into carts as required to fulfil orders. The majority of the dealers are in a small way of business, many of them being storekeepers, green-grocers, express-men, &c. They take the coal from the merchants' sheds at the time most convenient to themselves—sometimes to their premises, sometimes direct to their customers.

There is in Auckland no merchant or dealer trading exclusively in coal (with one exception to be specially noticed later on), the coal-trading being regarded as an adjunct to other lines of the whole business. The number of dealers has decreased considerably during the last six years. Dealers compete with one another for the trade of a particular area, there being no block system, and a dealer's cart may travel long distances to fulfil comparatively small orders. The average suburban delivery may be put at one mile and a half. The dealer, of course, arranges his calls in such a way as to economize his time. A man, horse, and cart doing nothing else will deliver from 3 to 4 tons a day in $\frac{1}{2}$ -ton lots. It was admitted that labour engaged on this work does less now in a given time than in the past. Coal is carried in bags to the consumers' bins—these often most inconveniently placed—and it is a frequent practice for the bags to remain with the consumer to be collected at the delivery of the next order, which, of course, adds considerably to the expenditure on sacks. The commonest order is for $\frac{1}{2}$ -ton lot. Liberal discount, both for cash and for payment at the end of the month, is allowed purchasers both by merchants and by dealers, but less than a quarter of the consumers avail themselves of the opportunity to get the full concession.

Of the screened coals from the mine the householder has a choice of two sorts—namely, house coal and kitchen coal (or steam coal). The former is the larger in size, being the result of a larger screening-net. During the war period the proportion of kitchen coal in household use has increased considerably. It costs less to produce and distribute the kitchen coal, which is probably more economical to the average householder.

No State coal is placed on the Auckland market.

(b.) *Prices.*—Table 37 shows *the changes in the price of household coal at Auckland* during the war period as sold by the Auckland Coal-dealers' Association.

TABLE 37.—SHOWING THE CHANGES IN THE NET RETAIL PRICE OF HOUSEHOLD COALS AT AUCKLAND, 1914–18.

	1914 to June, 1916.	June, 1916, to July, 1917.	July, 1917, to December, 1917.	December, 1917, to September, 1918.	From October, 1918.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
House	1 13 6	1 17 6	2 1 6	2 2 3	2 7 6
				26 per cent. increase	41·8 per cent. increase.
Kitchen or steam	1 10 6	1 14 9	1 18 0	1 18 9	2 3 6
				27 per cent. increase	42·6 per cent. increase.
Reasons for rise...		Rise at mine of 2s. 6d. on house and 2s. on kitchen coal, 10 per cent. rail freight; rise of 4s. a week carters' wages, 20 per cent. shed wages	Rise 3s. per ton at mine; increased cost of distribu- tion	Rise 10 per cent. railrage	Rise 2s. a ton on house, 1s. 6d. kitchen; 10 per cent. rise shed wages; 6s. a week rise carters' wages, carried since November, 1916; and other increased costs of distribution.

The rise in the retail price of house coal amounted to 8s. 9d. per ton up to September, 1918. Of this rise, increased price at the mine accounted for 5s. 6d., or 63 per cent. of the total increase; increased railrage for 1s. 5d., or 16 per cent.; rise in other costs—special to the retail distributor—1s. 10d., or 21 per cent.

For the same period the rise in kitchen coal was 8s. 3d., accounted for by 5s. in mining-cost, or 61 per cent.; 1s. 5d. railrage, 17 per cent.; 1s. 10d. in other costs, 22 per cent.

From the 1st October of this year the price of house coal has risen 14s. per ton over the pre-war price; 7s. 6d., or 54 per cent., of this rise is due to increased price at the mine; increased railrage accounts for 1s. 5d., or 10 per cent. of the total; other costs 5s. 1d., or 36 per cent. of the total.

Kitchen coal has risen by 13s., of which 6s. 6d., or 50 per cent., is due to the increased price at the mine; 1s. 5d., or 11 per cent., to the increased railrage; and 5s. 1d., or 39 per cent., to increases in other costs of distribution.

(c.) *Demand and Costs.*—A rise in the price of a commodity may be accounted for by conditions affecting the supply or demand, or both supply and demand. The general conditions affecting the supply and demand of coal have been referred to in Chapter I, section 7 (vi). In the particular case of Auckland coals *there has been a shortage over the war period*, and a shortage in the two senses of that term—on the one hand a contraction of coal-supplies, causing them to fall below the normal level; and on the other hand, at certain seasons, an increase in the demand above the normal level. A mere fall in the output of a coal-mine or in the turnover of a coal-dealer will of itself cause the average cost per ton of producing or dealing in coal to rise, because the fixed charges of the colliery, of the coal-yards, and delivery, &c., are divided up over a smaller tonnage. The price-raising effect of such a fall, which in the case of New Zealand during the last few years has been considerable (see Chapter I, p. 23), has been aggravated by (1) considerable rises in the prices of materials and labour used in production and dealing, and (2) the unusual eagerness of consumers, beset with the fear of a coal-famine, to obtain supplies of coal often in advance of their needs. In connection with the last-mentioned factor it is to be noted that the undoubted increase in the demand of coal for all industrial purposes (including naval and mercantile marine) has reacted unfavourably on the supply of household coal.

Analysis of the costs of dealing in coal, however, suggests that the dealers have not increased the price of house coal beyond the level sufficient to reimburse them for the increased costs of their

businesses and their own living, and in view of the character of the demand for coal they could have cleared the stocks at much higher prices. We feel justified in expressing the opinion that *the increased costs operating from the side of supply have been alone sufficient to account for the whole of the rise that has actually taken place in the consumer's price.*

The cost of production of Waikato coals increased about 18 per cent. over the period to September, 1918, or a little over 1s. 7d. per ton; the average annual selling-price at the mine being increased by about 1s. 8½d. It must be remembered, however, that only about a quarter of the mine's output is house coal, a little over one-third kitchen coal, the rest being chiefly slack. Since the price of a certain proportion of the steam coal is fixed for long periods by contract, and that of slack is very inelastic, the bulk of the rise in the price of coal at the mine—due to the rise in the cost of production—has to be borne by the house coal. Hence this helps to explain the rise in the price charged by the mines for house and kitchen coal of 5s. 6d. and 5s. (7s. 6d. and 6s. 6d. per ton since the 1st October) respectively when compared with the rise of 1s. 8½d. in the selling-price per ton averaged over their whole output.

Table 38 shows in summary form *the costs of distribution at Auckland* of house coal in September, 1918, as sworn in evidence.

TABLE 38.—SHOWING THE COST PER TON OF DISTRIBUTING HOUSE COAL IN AUCKLAND, SEPTEMBER, 1918.

Cost.	Firm A, 10,000 Tons.	Firm B.	Firm C, 14,155 Tons.	Firm D, Retail, 1,600 Tons.	Firm E1, Mount Eden, 7,790 Tons.	Firm E2, Newmarket, 2,307 Tons.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Coal	0 19 10	0 19 10	0 19 10	1 0 4	0 19 9·6	0 19 9·6
Freight	0 7 9½	0 7 11	0 7 11	0 8 2	0 8 3	0 8 3
Bagging and loading ..	0 2 0	0 2 0	0 2 9 (actual)	0 1 9	0 2 0·3	0 1 10·7
Loss in sacks	0 1 6	0 2 0 (3s. retail)	0 1 6 (2s. retail)	0 1 6	0 0 1·11	0 0 2·1
Loss in transit and handling	0 1 3	0 1 3	0 1 3	0 1 3	0 1 10·2	0 1 1·63
Siding charges and shunting	.. ..	0 0 4	0 0 3½	.. ..	.. ..	.. ..
Rent of sidings	0 0 9½	0 0 4	0 0 4	0 0 9	0 0 0·83	0 0 3·24
Overhead expenses, &c. ..	0 0 10	0 0 10½ (1s. retail)	0 1 9	0 1 0	0 0 6·27	0 0 5·92
Bad debts	0 0 5	0 0 5	0 0 2½	.. ..	.. ..	.. ..
Rates and taxes .. ..	.. ..	.. ..	.. ..	.. ..	0 0 10·09	0 0 7·69
Total wholesale	1 14 5	1 14 11½	1 15 10	1 15 1	1 13 5·4	1 12 7·97
Dealers' shed price	1 14 6	1 14 6	1 14 6	1 14 6	1 14 6	1 14 6
Profit (wholesale)	0 0 1	0 0 5½ (loss)	0 1 4 (loss)	.. ..	0 1 0·6	0 1 10·03
Extra loss on sacks	0 1 0	.. ..	0 0 6	.. ..	.. ..	.. ..
Cartage	0 6 0	0 6 0 (7s. 6d. actual)	0 6 0	0 6 7	.. ..	.. ..
Profit (retail)	0 0 10	0 0 2½ (loss)	0 0 1 (loss)	0 0 7	.. ..	.. ..
Retail price	2 2 3	2 2 3	2 2 3	2 2 3	.. ..	.. ..

There is no item of costs for which the Board did not obtain actual figures as well as estimates. Even in the case of overhead expenses, which it is difficult to ascertain, owing to the fact that actual distribution is only a part of the business, the actual figures obtained by analysing these expenses in large businesses increased from 2½ per cent. in 1912 to 5½ per cent. in 1918, though only 2½ per cent. has been allowed for in the above table. No allowance for depreciation or interest on capital has been made.

TABLE 39.—SHOWING THE INCREASE IN THE COST OF DISTRIBUTION OF COAL AT AUCKLAND BY RETAILERS BETWEEN 1913 AND SEPTEMBER, 1918.

Cost of					1913.	September, 1918.	Increase.
					Per Ton. £ s. d.	Per Ton. £ s. d.	Per Cent.
House coal	..	..	..	..	0 14 9	0 19 10	34½
Railage	..	..	..	..	0 6 6	0 7 11	21
Shunting	..	..	..	..	Nil.	0 0 2	..
Depot wages	..	..	..	..	2 2 0*	3 0 6*	44
Casual labour	..	..	..	..	0 1 0†	0 1 4½†	38½
Drivers .. ..	..	..	..	..	.. ..	.. ..	..
Other stable charges	..	..	..	..	.. ..	.. ..	..
Horse-feed—Chaff	..	..	..	..	5 15 0	14 10 0	150
„ Oats	..	..	..	..	0 3 0	0 6 3	108
Harness (new) .. ..	..	..	..	..	.. ..	.. ..	50
„ (repairs) .. ..	..	..	..	..	.. ..	.. ..	75
Wheelwright (new) .. ..	..	..	..	..	.. ..	.. ..	35
„ (repairs) .. ..	..	..	..	..	.. ..	.. ..	50
Shoeing	..	..	..	..	0 7 0	0 14 0	100

* Per week.

† Per hour.

The costs of distribution have therefore risen to such an extent compared with retail prices as to make it extremely unlikely that small dealers, as apart from merchants, make anything like a reasonable profit on coal alone. One of the largest retailers (conducting a carrying business also) assesses the increase for the period in question as follows:—

TABLE 40.

Rent	..	..	..	From £61 to £200 for practically the same land.
				s. d. s. d. s. d.
Coal	..	..	..	From 15 6 to 20 4 per ton = 4 10, or 31 per cent.
Railage	..	..	..	From 6 9 to 8 2 „ = 1 5, or 21 „
Bagging and loading	..	..	..	From 1 6 to 2 1 „ = 0 7, or 40 „
Loss on sacks	..	..	..	From 0 9 to 1 6 „ = 0 9, or 100 „
Rent and siding charges	..	..	..	From 0 6 to 0 9 „ = 0 3, or 50 „
Office expenses and bad debts	..	..	..	From 0 9 to 1 0 „ = 0 3, or 33 „
Delivery— $\frac{1}{4}$ -ton lots	..	..	..	From 9 0 to 9 4 „ = 0 4, or 4 „

Total dealers' costs have increased, therefore, according to this statement from £1 14s. 9d. to £2 3s. 2d.—i.e., 8s. 5d., or nearly 25 per cent.; while the retail price of coal has been advanced in the same period 8s. 9d. for ton lots.

Profits in distribution in Auckland are obtained by the larger dealers in the retail trade, not in the pure wholesale. In 1912 a large firm estimated the merchant's profit at 6½d. per ton: in 1918 the same firm reports a corresponding loss of 5½d.

The most favourably situated of the wholesale dealers has a large colliery which distributes a large proportion of its own coal, and it gave us an exact analysis of a full year's trading-costs and profit. The profit worked out at 1s. 1d. per ton, or about 7 per cent. of the expenses. But the company had no bad debts; its overhead expenses were small, due to the fact of the distribution being organically linked up with the mining; it had been very fortunate in its buying of sacks in the past; and it made no provision for depreciation of its distributing plant. On the other hand, its income-tax was particularly heavy, through the fact of the distribution revenue being treated by the Tax Commissioner as part of the colliery revenue. If allowance be made for sacks at current prices the rate of profit falls to about 4 per cent.

A few notes are called for regarding some of the items of distribution in the foregoing tables:—

Coal: The selling-price of house coal at the mine increased 34½ per cent. between 1913 and September, 1918; the selling-price in Auckland by 26 per cent. Distribution-costs have risen, but not so rapidly nor so high as mining-costs, and the distributors have been obliged to carry increased charges for a longer period without proportionately raising the price to buyers, being able in many cases to do this mainly because coal-dealing is only a side-line with them, or a means of increasing their main line of business. In October, however, 3s. 3d. of the total rise of 5s. 3d. per ton on house coal provided for these increased charges.

The position illustrates the general principle that *retail prices are more rigid*—less flexible—than wholesale prices. But the point was rapidly being reached in the latter part of last year when advances would have to be made in the retail price in order to afford distributors a rate of profit that may be regarded as reasonable under the present system.

After 1st October the rise in the retail price amounted to 42 per cent. compared with the rise of 48 per cent. in the price of house coal at the mine itself. The rise in the price per ton (in ton lots) of house coal at Auckland, compared with the pre-war period, is now 14s., of which 7s. 6d., or 54 per cent., is due to increased mine-cost, 1s. 5d., or 10 per cent., to higher railway charges, and 5s. 1d., or 36 per cent., to increases in the cost of distributing borne directly by retailers.

Railage: There have been two increases of 10 per cent. each, equivalent to 21 per cent. in all, amounting to 1s. 5d. per ton of coal of all grades from Huntly to Auckland.

Bagging and Loading: This costs about 2s. per ton, although in the case of one firm which worked out the costs exactly from its own accounts it amounted to 2s. 9d. per ton for labour and shunting trucks, weighing, picking out dross and stones, trucking to the platform, stacking on the platform, redelivery to carts, loss of time waiting on trucks, shortage of coal, and repairs to sacks. The increase in this item is due mainly to the increase in the wages of shed hands and casual labour, amounting to over 40 per cent. on the average for the period under review, and to the shortage of coal-supplies.

Loss on Sacks: This amount varies considerably; it is greater in the retail trade than in the wholesale; there is more wear-and-tear on the sacks, and there is extra loss through the sacks being left with the consumer until the delivery of the next order. A considerable number of bags is lost every year through dishonesty and carelessness. The loss from all causes in the retail trade is from 6d. to 1s. greater than in the wholesale. The loss is also greater with hard coals than with soft, and with house coal than with kitchen or through. The bags may be worn out in three or four uses, though when repaired they may last through six uses. The life of the coal-sack is apparently much shorter in Auckland than in the southern centres. The estimates of cost run from 1s. 6d. to 3s. per ton at the current price of bags—9s. to 10s. per dozen, twelve bags to the ton.

Loss in Transit: This is a considerable item, and it varies in amount according to the kind of coal, the length of distance from the mine to the market, the number of handlings, the state of the weather, &c. Estimates vary from 1s. 3d. to 1s. 10-2d. (an actual figure) for local coals, and 2s. 6d. for Australian coal. The loss in weight is greatest in house coal, one reason being that it lends itself

more easily to pilfering. The loss in general is due to spilling and pilfering *en route*, evaporation, wind and other weather disturbances while screening. It must be remembered that every handling tends to make dross. The regulation of the Railway Department insisting on at least 6 tons full weight being placed in every truck is responsible for some of the loss, as it is impossible for some trucks to hold 6 tons without great risk of spilling. (This is particularly the case in the South Island with brown coal and lignites.)

Siding Rents: These have increased considerably for the period, those of one firm 400 per cent. in seven years, of another over 200 per cent. in four years. An additional shunting-charge of 2d. per ton has also been imposed during the period.

Cartage: This is difficult to assess precisely, because no one carter is engaged exclusively in delivering household coal. The majority of the estimates set down an average of 6s.; but one firm, having analysed its actual cost as nearly as it could for a period of six months, involving from fifteen to twenty men engaged mainly upon the delivery of coal, found its costs to be 7s. 6d. per ton (including profit). The secretary of the Drivers' Union thinks that 7s. 9d. per ton is a reasonable price for the delivery of coal; 6s. is reasonable for general carrying, in his opinion; but "a man who is not continually delivering coal is somewhat at a disadvantage. First of all, he has to go to the merchant to get coal, which is supplied to him in sacks; he has to deliver the coal; there are some very awkward places that will necessitate often the driver putting in thirty minutes in putting coal where it is needed. That driver has often to return the sacks to the coal-merchant, otherwise he is charged 10d. per sack." This sum (7s. 9d.), of course, includes depreciation and profit, as well as provision for the maintenance of the horse, cart, and man. But the majority of the dealers in coal are satisfied if they receive the current rate of wages, and make very small profit, if any, on the coal-delivery.

Cartage per ton delivered increases rapidly as the size of the average order diminishes. It costs much more to deliver a given quantity of coal in bag or $\frac{1}{4}$ -ton lots than in ton lots. Undoubtedly the shortage of coal during the last four years and the consequent necessity of coal-dealers rationing out their diminishing supplies to consumers has helped to raise the retail price by lowering the average amount delivered per man, and therefore raising the cost of delivery.

(d.) *Newcastle Coal.* Only a very small amount of Australian coal is used in Auckland for household purposes. The cost of Australian coal at the ship's slings was as follows:—

TABLE 41.—COST EX SHIP OF NEWCASTLE COAL AT AUCKLAND.

	1916-17.		1918.		Percentage
	s.	d.	s.	d.	Increase.
F.o.b. Newcastle	11	3	15	0	33 $\frac{1}{3}$
Freight	11	3	16	3	44 $\frac{1}{2}$
Wharfage	1	3	1	3	..
Harbour - improvement rate (since September, 1917)	..	..	0	6	..
Total ex ship	23	9	33	0	39

A large proportion of the coal is taken by the Railway at £1 13s. 9d. Coal taken for Government purposes pays no wharfage or harbour rate, and out of the 2s. 6d. profit the wholesale importer has to pay his costs—insurance, exchange, loss in weight, and overhead charges.

The following is a dealer's estimate (September, 1918) of the distributing-costs of Australian coal in Auckland:

TABLE 42.

	£	s.	d.
Cost ex ship	..	1	13 0
Cartage to yard and trimming	..	0	3 0
Rent	..	0	0 9
Bagging and loading	..	0	2 9
Loss in weight	..	0	2 6
Loss on sacks	..	0	2 0
Delivery	..	0	7 0
Expenses	..	0	2 9
Bad debts	..	0	0 3
		2	14 0

Since there has been a great falling-off in the importation of Australian coals during the war period, the proportion of the total available supply in New Zealand taken by the Government railways has increased considerably.

Newcastle coal is harder on sacks than lignite. The loss of weight between Newcastle and Auckland amounts to as much as 5 per cent.—for example, 47 tons out of a cargo of 1,000 tons.

(e.) *Public Apathy.* Though the increase in the price of coal has been felt acutely by the smaller consumers, particularly those taking bag lots, it appears that the majority of the customers of some dealers do not complain of the higher price, regarding this as an inevitable accompaniment of war conditions, or as the necessary result of a well-deserved increase in the pay of miners and all others engaged in an industry the conditions of which they believe to be most unpleasant. Consumers do not appear to be sufficiently alive to their own interests to take advantage of opportunities of obtaining coal at a lower price, or of preventing a rise in price, or of developing the best and most

economical methods of firing grates and ranges. In Auckland there is not that wide difference in the prices of the same kind of coal which is observable in some of the southern centres; but the experience of one firm shows that the public is slow to buy in the cheapest market, even when the goods are of similar quality and are brought directly to the notice of consumers. Six thousand people in a large suburban area in Auckland were afforded an opportunity of obtaining their coal at from 4s. 3d. to 5s. per ton cheaper than they could obtain it elsewhere, conditionally upon either cash with order or collection on delivery, and taking no less than three bags ($\frac{1}{4}$ ton) at a time. Within four months fewer than 150 took advantage of the possibility of making this saving—amounting to over 10 per cent. in their coal bill.

(f.) *Possibilities of Improvement.*—In the Auckland District itself we gathered only a few suggestions for improvement in the method of distributing coal.

(1.) *Railways:* Complaints were made of the length of time taken by the railway to carry coal from the mine to the dealer's siding; in many cases the time extended to two or three days. It was alleged, too, that some of the pilfering *en route*, which undoubtedly occurs, is due to the railway employees. It was suggested that the distribution of coal would be improved if a mineral express train were made up every day from Huntly to the southern markets. The Railway Department, however, states that there is not sufficient business between Huntly and Marton (246 miles) to provide a full train-load, and that existing services provide for coal being carried between them at present in twenty-seven, thirty, and thirty-nine hours respectively.

(2.) *Bagging at the Mine:* A suggestion was made that coal should be bagged not at the dealer's shed, but at the mine. This, however, does not appear to be advisable. It was tried some time ago in Auckland with coal for the Taranaki District, and was abandoned. The practice increased the cost, because of the more rapid decay of the bags, the increased handling, and shortage of sacks.

(3.) *Baskets instead of Bags:* It has been proposed to substitute for bags, wicker baskets, to be filled at the mine, and packed in trucks. These baskets would hold about 180 lb. each, are estimated to last seventy-five times, and would cost at current prices from 10s. to 12s. each. While their use would be attended with certain advantages, these would be outweighed by the disadvantages. The baskets would be awkward to handle, and to carry, not fitting comfortably to the spine; their use would increase the difficulty of detecting short-weight by inspection; and their comparative rigidity would prevent satisfactory packing with the larger coal.

(4.) *Increased Use of Small Coals:* The greater the demand for the smaller coals such as through coal and slack, or even kitchen or steam, as a substitute for best screened coal, the greater is the probability of a fall in the price of screened. Undoubtedly, the price of house coal would have risen more than it has done but for the increased proportions of kitchen, through, and slack used for household and other purposes. It is clear, however, that the great majority of consumers demand large screened coal as necessary for household use, and any lowering of the price of house coal through this means must be looked for in the direction of the greater industrial use of the fine coals, and the education of the housewife to the possibility and profit of small-coal consumption in grate and range.

(5.) *Elimination of the Small Coal-dealers, and the Institution of Central Agencies for Mines, Municipal Depots, or Co-operative Coal-stores:* The Pukemiro Collieries Company delivers kitchen coal in a certain part of Auckland for 4s. 3d. a ton, or over 10 per cent. cheaper than the ordinary dealers. The Auckland Co-operative Society sells its kitchen coal in ton lots for 6s., or 15 per cent. cheaper to its members than the ordinary dealers' price, showing a profit of 3s. 3d. a ton, or over 10 per cent. (The actual profit is less, owing to the average order being below a ton.) In the case of this society most of the clerical and managing work was done without remuneration, but, after making allowances for this, there is still a substantial saving to the consumer.

The dealers who are in business on a big scale can subdivide their orders according to localities, and serve several customers within a comparatively small area from one trip of each cart, but the smaller dealer's costs are enormously increased by the long distances he has to travel to fulfil his daily orders. Consumers could help to systematize delivery, and thereby keep the cost of cartage down, by ordering their coal before their supply runs out.

(6.) *Correct Weight:* There is, of course, a rise in the real price of coal if, the money paid remaining the same, the amount delivered to the consumer is less. This is the problem of light weight. Though the evidence is contradictory, the probability of light weight in coal-deliveries in the Auckland District is established. The temptation to give light weight has, of course, increased with the diminution in the supply of coal, making coal more valuable. It is much easier to give light weight in coal than in most other goods. We were told that frequently dealers bag more than twelve bags to the ton—they sell not a ton of coal, but twelve bags of coal. Small dealers may make another sack out of the twelve obtained from the merchants' sheds. Then there is the probability of pilfering on the way from the yard to the consumer's house. It is estimated by an authority with special means of knowledge that *the coal as delivered to the consumer is about 5 per cent. short of the weight as given by the dealer*. It is easy to make a partially full bag of coal appear to be full, and when repaired bags are used the possibility of light weight is increased. The responsibility for this shortage of weight must rest on both dealer and carter.

The use of hundredweight bags has been suggested as a remedy, but the drivers object to this, as it would mean twenty journeys instead of twelve, and the smaller bag is not so well adapted to the carrier's back as the larger. The small bag is used in Wellington apparently with a net advantage which may, however, be due to the steeper nature of much of the ground to be covered by delivery in Wellington, prohibiting altogether the use of the heavier sack.

(g.) *Rate of Distributor's Profit.*—It is assumed that the question of the reasonableness of distributors' profits refers to coal-dealing under existing conditions and with the present methods

of distribution. In that case *the answer is an unqualified affirmative*. Viewed in itself the business of distributing coal brings in a very small return to those who pursue it—in most cases not much more than the current rate of wages for unskilled work, even if allowance be made for the probability of overestimates of cost in the evidence presented. The coal-dealing business, which is, in the case of household coal, carried on for a part of the year only, is regarded by its owner as a part of his general business—a part which, though it is returning little or no direct profit, may enable him to use a larger plant and to keep down costs relative to turnover in his business as a whole. In many cases it would appear that the profit is constituted largely of the difference between the allowance for bad debts and the discount in the case of those customers who do not avail themselves of discounts, but pay the gross price within a reasonable time.

The further question as to whether existing conditions and methods are reasonable or not—capable of improvement or not—is of general application to the Dominion, and is dealt with in Chapter VIII.

(iii.) DISTRIBUTION AT WELLINGTON.

(a.) *General*.—Wellington draws its supplies of household coal from the West Coast, the Waikato district, and Newcastle. Probably the Westport coal constitutes 80 per cent. of the coal consumed in Wellington households. Up to the winter of 1916 household coal was rescreened in the retailers' yards in Wellington. Since that date the coal has been mine-screened only. The cost of transporting the coal from the mines to the wholesale depot at Wellington for the years 1914-18, and the percentage which that cost is of the retail price at the present time, are shown in the following table :—

TABLE 43.—COST OF CARRIAGE OF COAL TO WELLINGTON.

Cost of Carriage to Wellington from	1914.	1918.	Increase per Cent.	Ratio of Cost of Carriage to Retail Price.
	s. d.	s. d.		
Westport and Greymouth	5 7	9 7	72	19 per cent. (Westport coal).
Huntly	12 7	15 3	21	29 per cent.
Newcastle	10 0	16 6	65	32 per cent.

The retail dealer takes delivery of the coal at the wharf or the railway-station, carts it loose to his yard, bags and stores it, and thence delivers it as required to the consumer. In Wellington twenty bags go to the ton. Cartage and delivery costs are heavy, because of the naturally steep and uneven configuration of much of the urban and suburban areas. A man with a dray and two horses delivers from 3½ to 4 tons per day within the town area, and 2½ to 3 tons within the suburban area ; but frequently two men are required to deliver a load. There are about thirty traders, nearly all of whom are members of the Wellington Coal-dealers' Association, most of them conducting businesses on a small scale, working themselves and employing on the average another man. Neither the association nor its individual members appear to exercise any trade discrimination against non-members. The association fixes the changes in the retail prices of coal, and this scale of prices is generally followed by the trade, though occasionally higher prices are charged by individual dealers.

The regular traders in coal suffer hardly any competition from outside sources—little or none, for example, from carriers, who in some other centres do a not inconsiderable trade in small lots direct from the wholesale depot to the consumer. In Wellington the margin for cartage (5s. 6d. per ton ; 1s. 9d. per quarter-ton ; 3d. per cwt.) appears to be so small between the retail rate and the depot rate as to preclude any profit from such trade.

(b.) *Prices*.—The prices fixed by the association are for cash, booked 2s. extra, and 1s. discount if paid by the 20th of the month following purchase. It is estimated that the cash business forms about one-half of the total business, and that the majority of the remainder of the other half is monthly discount business. There are two scales of prices—one for the city and the other for the suburbs—the latter being, for the greater part of the period under review, 3s. more than the city rate, and recently 4s. more.

Table 44 shows *the changes in the retail price of each of the chief household coals at Wellington during the period January, 1914, to January, 1918*

TABLE 44.—RETAIL PRICES OF HOUSE COALS AT WELLINGTON, 1914-18.

Coal.	26 Jan., 1914.	27 May, 1914.	7 Feb., 1916.	1 July, 1916.	9 Dec., 1916.	25 Jan., 1917.	17 July, 1917.	13 June, 1918.	Sept., 1918.	Increase.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	Per Cent.
Westport	36 0	..	39 0	41 6	43 0	..	50 0	..	..	14 0	39
All screened	36 0	..	39 0	41 6	43 0	..	..	..	..	..	..
Taupiri	36 0	40 0	42 0	45 0	46 6	..	52 0	..	54 0	18 0	50
Slack	25 0	..	25 0	25 0	26 6	..	32 0	..	..	..	..
Mixed Waikato and other ..	..	..	..	..	45 0	..	51 0	..	..	..	..
Newcastle	36 0	..	..	..	..	48 0	52 0	..	..	16 0	44
Paponga	..	..	..	..	..	46 6	52 0	..	..	..	..
All unscreened	..	..	..	..	..	..	..	39 0	..	..	..
(Suburbs, 3s. extra ; booked, 2s. extra.)								(Suburbs, 4s. extra.)			
State (house)	33 0	..	..	..	..	..	..	37 0	..	4 0	12
„ (small)	18 0	..	..	..	..	..	..	24 0	..	6 0	33½

This shows an increase of 14s. per ton, or 39 per cent., in the case of the standard household coal. This increase is made up of 9s. 6d. in the wholesale price to the coal-dealer, which rose from £1 5s. 6d. to £1 15s.—a rise of 38 per cent.—and 4s. 6d. in the increased cost of retailing, excluding prime cost. Of the increase in the wholesale price, 4s. has been due to the rise in shipping freight, the remainder to railway increases (about 7d.) and to the rise in the general cost of production at the mine. The quoted wholesale price includes 1s. wharfage, which has remained unchanged over the period. The increase is, therefore, roughly equally divided between the rise in the mine-cost and the rise in the cost of transport. These rises in the wholesale price occurred on the following dates :—

Date.	Rise. s. d.	Cause.
14th February, 1916 ..	2 0	Increase in steamer freight, wages, railway carriage, and general cost of production.
3rd July, 1916..	2 0	
10th April, 1917 ..	2 0	Increase in general cost of production.
18th July, 1917 ..	3 6	Increase in freight, wages, and other costs.

In the case of another coal supplied from the same field to the Wellington market the wholesale price has increased by the same amount (9s. 6d.), the rises taking place as follows :—

Date.	Rise. s. d.	Cause.
November, 1915 ..	0 4	Increased railage.
July, 1916 ..	2 8	Steamer freights, and increases in mine wages.
January, 1917 ..	1 0	Further increase in the mine-cost of production.
April, 1917 ..	2 0	
July, 1917 ..	3 6	Advance in steamer freights, and in mine-labour cost.

The increased cost of retailing the coal is roughly equal to the separate increased cost in mining or in transport, each accounting for about a third of the total increase. The extra retail cost has been due mainly to higher wages to the yardmen and drivers, increased cost of forage and of maintenance of plant, with a rise in the per ton cost of delivery owing to the shortage of supplies.

The retail price of State house coal was increased once only—viz., in July, 1916, by 4s. a ton, or 12·1 per cent., made up of increased charges—freight, 1s. 6d.; rail, mineto Grey mouth, 6d. (approximate); 2s. increased wages, cartage, and other costs. The increase in freight of 2s. 6d. per ton in December, 1917, has not been passed on to the public; other charges have also increased, and the State depot appears to have been losing at least 3s. 3d. per ton on the house coal it retailed at Wellington in March, 1918; the estimate of present loss is about 4s. 6d. Any profit it makes is made out of the ex ship wholesale trade.

TABLE 45.—INCREASE IN THE PRICES EX SHIP, WHOLESALE, OF STATE COALS AT WELLINGTON, 1915–18.

State Coal.	Increase in Price per Ton, 1913–18.	Increase per Cent., 1913–18.	Rate of Profit	
			Per Cent., 1913.	Per Ton, 1918.
	s. d.			
Screened*	..	..	6·66	..
Unscreened—				
Point Elizabeth	9 0	43·9	7·89	20
Liverpool	9 0	43·9	7·89	5·05
Point Elizabeth (small)..	9 0	64·29	3·7	6·56
Liverpool (small)	7 0	43·75	18·52	6·56

* No sale in 1918.

(c.) Costs.—The following estimate of the present cost (January, 1919) of retailing household coal in Wellington may be accepted as accurate. This estimate differentiates between the city and the suburban trade, and refers to a turnover handled by one man with two horses and a dray, working 275 days in the year, and handling 1,100 tons in the town, or 825 in the suburbs.

TABLE 46.

					City. s. d.	Suburbs. s. d.
Cartage to yard	..	..	..	..	3 6*	3 6
Yard expenses.. .. .	..	..	..	..	4 3	4 3
Sacks.. .. .	..	..	..	..	1 6	1 6
Cartage to customer ..	..	..	..	..	6 5	8 7
Total distributing-costs ..	..	..	..	..	15 8	17 10
Coal ex ship	..	..	..	..	35 0	35 0
Total retail costs	..	..	..	..	50 8	52 10
Average retail price	..	..	..	..	53 0	56 0
Profit	..	..	..	..	2 4	3 2

* Average of railway and wharf.

In this estimate no allowance has been made for the times during which no coal has been available to distribute. During the past year such contingencies have not been infrequent—in one case during January, 1919, the yard had been bare of coal for ten days, with none in sight. On such occasions the hands are generally kept on, and a large proportion of the expenses continue with no corresponding income.

It is to be noted also that the "average retail price" is not the ton rate, but a rate between the quarter-ton rate and the hundredweight rate, as the greater part of the business done by retailers of late has been in small lots. This fact, however, increases the cost, and this increase in cost, due to the diminution in the size of the average order, has not been fully allowed for in the above estimate. The suburban portion of this estimate refers to a business which is worked from a yard in the city.

The following is an estimate of the costs of a retail suburban dealer whose yard is situated in the suburb itself:—

TABLE 47.

			s.	d.	
Cartage to yard	..	..	10	0	during shortage of supplies— about 7s. with normal supply.
Cartage to customer	..	..	6	6	
Sacks..	..	..	2	1	
Rent and depreciation	..	..	1	6	
Coal ex ship	..	..	35	0	
			55	1	
Average retail price	..	..	56	0	
Leaving	..	..	0	11	for bagging, weighing, office ex- penses, &c.

The increase in the cost of conducting a retail business, excluding the increase in the prime cost of the coal, amounts to at least 4s. 6d.—an increase of about 40 per cent. over the period since the beginning of 1914. This increase in cost may be analysed thus—

	s.	d.	
Cartage to yard, rise of	1	3	per ton.
Increase in wages to yardmen and drivers, and in the price of forage..	2	0	„
Increase in other expenses, salaries, rates and taxes, insurance, main- tenance, advertising, depreciation, &c.	1	3	„
Total	4	6	„

Comparing the years ending the 31st March, 1914, and the 31st March, 1918, the State depot finds its wages-cost increased from 2s. 9·08d. to 4s. 1·91d. per ton over all coals, wholesale and retail, and its cartage-costs increased from 4s. 1·3d. to 6s. 2·11d. per ton. The total cost of handling and distributing these coals increased by 28·5 per cent. between these years. The cost of handling the retail business is higher, cartage accounting for over 7s., or nearly half the total cost (14s. 2·32d.) on the average of the year ending the 31st March, 1918. The charge for sacks is very much lower than in the case of private firms, being only 3·17d. per ton. For that year State coal cost, landed into trucks or carts at Wellington wharf, £1 5s. 10·97d., made up of f.o.b. price, Greymouth, 15s. 3·97d.; freight, 9s. 7d.; harbour dues, 1s. The total cost from mine to consumer worked out at £2 0s. 1·29d. per ton, the coal then selling at £1 17s. per ton in ton lots.

(d.) *Profits.* Considering the rises in the prices of materials and in wages in relation to the decreases in the average turnover and in the amount of work per day done by the workmen, we consider the increased charge (4s. 6d.) which retailers generally have passed on to the consumer is reasonable. In this connection it is interesting to compare the changes in the margin available to dealers who take supplies of coal direct from the wholesalers' yards to the consumers. Up to December, 1916, this margin—i.e., the difference between the ex depot or ex yard price to the dealer and the cash retail price—was 4s. per ton; from December, 1916, to July, 1917, it was 4s. 6d.; from July, 1917, it has been 5s. 6d. This is an increase of 37½ per cent., which is approximately the same as the percentage increase in the retailer's business-costs, excluding the price of his coal.

(e.) *Improvements suggested.*—Some four or five suggestions were made in evidence at Wellington. These are considered in framing the recommendations made in Chapter VIII, section 3.

(iv.) DISTRIBUTION AT CHRISTCHURCH.

(a.) *General.* Christchurch draws its supplies of coal oversea and by rail via Lyttelton from the West Coast (the Westport, Westport-Stockton, Blackball, and State mines being the principal sources), and from Newcastle; and by rail from Kaitangata, Nightcaps, Homebush, and other lignite-mines of the South Island of minor importance. All these coals are used for house purposes, but the Australian and West Coast coals are also used extensively in industry. The household consumption is distributed more equally over a more varied selection than in the other centres, but the bituminous coals of the West Coast are much preferred, and may be regarded as constituting the standard.

Cost of carriage per ton on coal brought to Christchurch is as high as 18s. 9d., or 46 per cent. of the retail price of the particular coal in question, and by sea and rail £1 2s., or nearly 40 per

cent. of the retail price of the particular coal carried. Compared with Auckland and Dunedin, Christchurch is disadvantageously situated in respect of its mines, but the coal marketed there is generally of better quality.

Table 48 shows the cost of carriage per ton of some of the more important house coals consumed in Christchurch.

TABLE 48.—COST OF CARRIAGE OF COAL TO CHRISTCHURCH.

Mining District.	1914.				1918.			
	Sea and Rail.			Rail.	Sea and Rail.			Rail.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Newcastle	10 6	and 4 9	..	..	16 6	and 5 6	..	..
Westport	6 6	and 3 9	and 2 4	..	10 6	and 4 6	and 2 10	..
Greymouth	6 6	and 3 9	and 2 6	..	10 6	and 4 6	and 3 0	..
Kaitangata	..	..	..	11 2	..	..	..	13 6
Nightcaps	..	..	..	13 5	..	..	..	16 3
Homebush	..	..	..	4 5	..	..	..	5 9
Avoca	..	..	..	..	..	..	..	7 7

Distribution is in the hands of coal-dealers, some of whom—unlike those in Auckland—are dealers, mainly or exclusively, in fuel. There is a North Canterbury Coal Merchants' and Dealers' Association, which, however, does not include all the dealers. Again, unlike the Auckland dealers, many of those in Christchurch do not observe the association's standard prices, but sell at different rates—some higher, and some, generally the larger firms, lower; in fact, in Christchurch coal of the same kind sells at widely different rates at the same time. This may be due to force of habit on the part of consumers, but it is also explained by the fact that consumers value promptness, courtesy, and fair dealing. Some of the smaller dealers give closer attention to the particular needs of individuals, who are willing to pay an extra price for this consideration.

Since there is a greater variety of coals in Christchurch than in Auckland, there is a wider range of wholesale prices.

Several dealers, as in the other centres, are engaged in both wholesale and retail distribution of coal.

The local and suburban coals (all lignites) are marketed by rail; the West Coast and Australian are conveyed by sea to Lyttelton, and thence by rail to Christchurch. Some dealers possess railway-sidings into which they discharge coal straight from the truck, others cart from the railway to their yards, either loose or bagged ex truck. In some cases the coal is screened again in the yard, though the practice of double-screening generally ceased with the recent acute shortage.

Delivery to consumers is by horse and cart or steam-lorry. The greater part of the area served is flat. The conditions of delivery are better than at Auckland, Wellington, or Dunedin, and the average run may be put at about two miles for the ordinary trader; but the average delivery per man per day of eight hours, with one horse and cart, is not more than from 3 to 3½ tons; in good times—that is, with a plentiful supply of coal—4 tons may be reached. The corresponding average of the State-coal delivery, of which a special record was made for the month of September, 1918, was 3½ to 4 tons. Dealers compete for the trade of a particular street or district, and the houses in one street may be served by several dealers; but the large dealers are able, to a certain degree, to systematize their delivery according to locality.

Coal is carried in bags to the consumer. There is competition in the fixation of the retail price, and the custom is to allow the consumer 3s. per ton discount for cash (2s. up to June, 1916), and, since June, 1916, 2s. for payment by the 10th of the month following delivery, after which no discount is allowed.

(b.) *Prices.*—Table 49 shows the *changes in the cash retail prices* per ton of the chief house coals at Christchurch, August, 1914, to September, 1918, according to the price-lists of the North Canterbury Coal Merchants' and Dealers' Association.

TABLE 49.—RETAIL CASH PRICES OF HOUSE COAL AT CHRISTCHURCH, 1914-18.

Coal.	1914-16.	February to June, 1916.	June, 1916, to January, 1917.	January to April, 1917.	April to August, 1917.	August, 1917, to July, 1918.	July to November, 1918.	Total Increase.	Increase per Cent.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	
Australian	39 0	42 0	46 0	53 0	53 0	57 0	58 0	19 0	49
Westport-Stockton ..	39 0	42 0	46 0	51 0	53 0	55 0	55 0	16 0	41
Westport	39 0	42 0	46 0	51 0	53 0	55 0	55 0	16 0	41
Blackball	37 0	40 0	44 0	48 0	50 0	55 0	55 0	18 0	46
Kaitangata	35 0	38 0	43 0	45 0	48 0	55 0	55 0	20 0	57
Nightcaps	33 0	34 0	38 0	41 0	44 0	44 0	44 0	11 0	33½
Homebush, Malvern ..	28 0	30 0	33 0	35 0	37 0	43 0	47 0	19 0	68
Avoca	..	..	..	..	..	..	51 0	..	..
Slack	26 0	30 0	33 0	37 0	39 0	42 0	42 0	16 0	62
State	34 6	39 0	39 0	39 0	39 0	42 0	42 0	7 6	22
(Unscreened.)									

This table shows an increase ranging from 22 per cent. to 68 per cent. in the retail price of house coal in general consumption. The case of State coal should be excluded from the comparison, as it

is retailed at a loss. The percentage increase is greatest in the case of the two main lignites. The cost of production of three lignites increased for the period as follows :

TABLE 50.

			s.	d.	
Increased cost of production at mine ..	..	A	..	9 5 ³ / ₄	, or 59 per cent.
„	..	B	..	7 6	, or 56 per cent.
„	..	C	..	4 0 ³ / ₄	, or 63 per cent.

The corresponding increases in the average selling-prices of these coals at the mines were—

				Average for Whole Output.		House Coal.			
				s.	d.	s.	d.		
A	..	..	..	7	2, or 44½	11	0, or 69	per cent.	
B	..	..	..	8	2½, or 60	9	10, or 54	,,	
C	..	..	..	3	1¼, or 47	6	0, or 55	,,	

In comparing the increases in the cost of production and the general selling-prices at the mine with the increase in the price of house coal it must be pointed out that house coal forms about two-thirds of the total output, and that the small coal can bear but a comparatively small increase in the selling-price, so that the bulk of the increase in price, due to a rise in the cost of production, has to be borne by the large or house coal.

Railage for the period has increased 21 per cent.

Table 51 summarizes the main facts in respect of these coals.

TABLE 51.—INCREASES IN PRODUCTION AND DISTRIBUTION COSTS OF BROWN COALS FOR CHRISTCHURCH, 1914-18.

	A.	B.	C.
	s. d.	s. d.	s. d.
Increase in cost of production at mine (on whole output, all coals) ..	7 6	4 0 ³ / ₄	9 5 ³ / ₄
Increase in selling-price at mine (whole output) ..	8 2 ¹ / ₂	3 1 ¹ / ₄	7 2
Increase in selling-price house coal ..	9 10	6 0	11 0
Railage ..	2 4	2 10	1 4
Other distributors' charges ..	7 10	2 2	6 8
Total increase, 1914-18 ..	20 0	11 0	19 0

The changes in the ex ship prices of oversea coals at Lyttelton are shown in Table 52. These ex ship prices include the price f.o.b. at Newcastle or West Coast ports, as the case may be, freight, insurance, exchange, office and other expenses of the wholesale importer.

TABLE 52.—PRICES OF OVERSEA COALS EX SHIP AT LYTTELTON, 1914-18.

Newcastle : 1914—August, 23s. 6d. ; September, 25s. 6d. 1915—February, 24s. 6d. ; April, 24s. 1916—January, 26s. ; July, 27s. ; August, 28s. 1917—January, 33s. ; June, 36s. 6d. 1918—February, 37s. 6d.* ; March, 36s. 6d. ; September, 37s. 6d. ; October, 36s. 6d.
Total increase, 13s. 6d., or 55·3 per cent. Increase in retail price, 39s. to 58s. = 19s., or 49 per cent.
Westport—Stockton : 1914—August, 26s. 1915—October, 26s. 4d. 1916—April, 28s. ; July, 30s. ; December, 31s. 1917—April, 33s. ; July, 36s. 6d. ; December, 36s. 10d. 1918—May, 37s.
Total increase, 11s., or 42·3 per cent. Increase in retail price, 39s. to 55s. = 16s., or 41 per cent.
Westport : 1914—28s. 1916—32s. 6d. 1917—38s. 1918—38s.
Total increase, 10s., or 36 per cent. Increase in retail price, 39s. to 55s. = 16s., or 41 per cent.
Blackball : 1914—24s. 1915—24s. 4d. 1916—April, 26s. ; December, 29s. 1917—April, 31s. ; July, 33s. ; December, 34s. 6d. 1918—36s. 10d.
Total increase, 12s. 10d., or 53¹/₂ per cent. Increase in retail price, 18s., or 46 per cent.
State : 1914—25s. 6d. 1916—29s. 6d. 1917—34s. 6d.
Total increase, 9s., or 35¹/₂ per cent. Increase in retail price, 7s. 6d., or 22 per cent.

* NOTE.—The rise of 1s. in Newcastle coal was due to the fact that there was no Union boat available, and that the Melbourne Shipping Company, which carried the coal, charges 1s. per ton higher freight.

Retail prices at Christchurch, it will be seen, have increased at a lower rate than wholesale prices at Lyttelton. The retailer has not increased his price in full proportion to the increase in his prime cost ; therefore either the other elements in his total cost have increased at a lower rate than the cost of his coal or he has refrained from passing on the whole of his extra costs to the consumer.

Table 53 shows how the total increase in retail prices over the period 1914-18 is divided among the separate charges.

TABLE 53.—DISTRIBUTION OF THE INCREASES IN COST OF RETAILING COAL AT CHRISTCHURCH, 1914-18.

Coal.	Increase in Mine Cost.	Percentage of Total Increase.	Increase in Freight and Mileage.	Percentage of Total Increase.	Increase in other Import Charges.	Percentage of Total Increase.	Increase in Business Costs of Retailers.	Percentage of Total Increase.	Total Increase.
	s. d.		s. d.		s. d.		s. d.		s. d.
Newcastle ..	4 0	21	6 9	35	2 3	12	6 0	32	19 0
Westport ..	4 6*	27	4 9 (+ 6d.)	35	0 9	5	5 0†	33	15 0
Blackball ..	8 10‡	46	4 9 (+ 7d.)	30	..	..	4 5	24	18 0
Homebush ..	11 0	58	1 4	7	..	..	6 8	35	19 0
Kaitangata ..	9 10	49	2 4	12	..	..	7 10	39	20 0

* Inclusive of 6d. increased mileage mines to Westport. † Based on the retail price of Westport Coal Company, which is 1s. lower than the association price. ‡ Including 7d. increased mileage Blackball to Greymouth.

(c.) *Costs*.—Several *estimates of the cost of retailing house coal* were obtained in evidence. The chief are summarized in Table 54.

TABLE 54.—RETAIL PRICE (MONTHLY CREDIT) OF HOUSE COAL AT CHRISTCHURCH, SEPTEMBER, 1918, WITH ESTIMATES OF RETAILERS' COSTS AND PROFITS PER TON.

	Firm A.			Firm B. Kaitangata Coal.	Firm C. Brown Native.	Firm D. Westport Coal.	Firm E. Grey Coal.	State Depot. State Coal.
	Australian and West Coast Coal.	Kaitangata Coal.	Reefton Coal.					
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Cost ex mine or ship ..	38 0 (B.B. 36s. 10d.)	44 0 (Christ- church railway)	21 0 (mine)	28 6	26 0	30 0	36 10	27 3
Wharfage ..	0 9	..	0 3	..	..	..	..	..
Freight ..	..	..	12 0	..	..	..	..	..
Railage ..	4 6	..	9 11	13 6	5 4	4 5	4 4½	4 6
Cartage to shed or yard ..	1 6	2 6	1 6	2 3	0 9	..	2 0	0 9
Bagging, loading, weighing ..	2 6	2 6	2 6	2 6	1 3	..	..	..
Loss in weight ..	..	..	..	2 6	2 4	..	..	..
Loss on sacks ..	1 3	1 3	1 3	1 3	1 0	..	1 0	..
Cartage to consumer ..	7 8½	8 6	7 8½	7 0	6 6	6 7	..	8 2
Overhead charges, including rents ..	3 6½	2 3	3 6½	2 0	4 0	..	..	2 11
Depreciation ..	0 7	0 3	0 7	..	..	..	..	..
Interest on capital ..	0 3½	..	..	..	..	..	..	..
Other items ..	..	..	..	..	..	..	11 0½	..
Total ..	60 7½	61 3	60 3	57 0	47 2	..	55 3	43 7
Retail price (monthly) ..	64 0	64 0	64 0	56 0	47 0	55 0	56 0	42 0
Retail profit..	..	2 9	3 9	1 0 (loss)	0 2 (loss)	..	0 9	1 7 (loss)

Freights, ship and rail, as already mentioned, form a considerable part of the prime cost to the retailer. In the case of coal from the Reefton field these charges are,—

	s.	d.
Rail to Greymouth ..	..	5 2
Grey harbour charges ..	..	0 3
Shipping charges ..	11	3 to 12s. (according to line).
Railage from Lyttelton and weighing ..	..	4 9
Total ..	..	21 5 to 22s. 2d.

Railage from Kaitangata is 13s. 6d. Freight and rail from Westport and Greymouth wharves is 15s.; from the mine-bins at Granity or Ngakawau to Westport 3s., and from Blackball, Dunollie, and Rewanui to Greymouth, 3s., 2s. 3d., and 2s. 7d. The railage from Avoca, the nearest field of any considerable immediate promise, is 7s. 7d. A matter of considerable importance is the probable freight charge on coal over the Midland Railway when opened.

The costs of *bagging and sacks* calls for no remarks of a character different from those made in the case of Auckland and other centres, except that in Christchurch bags have generally a longer life than in Auckland. The wear-and-tear of bags has increased with the diminution in the size of the average order.

The present cost of *cartage* is felt as a heavy charge. "It is the cost of delivery at present which is causing our profits to be so small," said one witness. Another estimated the cartage-costs on bag lots for some suburban deliveries at as high as 13s. a ton. "We could reduce this cost if we had the supplies of coal" was the common cry. The cartage-costs of the State depot increased by 1s. 1d., or over 15 per cent., in the two years 1917–18. A dealer employing four single teams, and with a turnover of nearly 1,200 tons, presented the following figures as representing his actual costs:—

TABLE 55.

	£	s.	d.
Horse-feed ..	151	13	5
Shoeing ..	13	17	6
Harness and drays (upkeep and depreciation of) ..	71	12	4
Sundry items ..	9	1	6
	246	4	9 = 4s. 2d. per ton.
Carters' wages..	211	13	8 = 3 6½d. ..
Total ..	458	18	5 = 7s. 8½d. ..

The cost of delivery has been increased during the period through the fact that the men generally employed are not as efficient as those of a few years ago. When the comparison is made with still earlier years the falling-off in efficiency is said to be greater, even if allowance be made for the shorter radius of delivery. In a business where the average delivery per man per day is 3 to 3½ tons, it was 6 tons twenty-two years ago, and in the opinion of the manager should still be not lower than 5 tons. There seems little reason for doubting the accuracy of the general observation that the intensity of labour has slackened of late years. This assertion was commonly made in reference not only to retail distribution, but to loading and unloading of wholesale lots. One witness testified that at a certain large port "about twenty years ago three men in a hold could put out 15 to 18 tons of coal per hour;

to-day there are five men in a hold, and they put out on an average 10 tons only"—that is, the amount per man per hour has fallen from 5 or 6 tons to 2 tons. Another witness gave the figures for the discharge of coal at another first-class port: eighteen years ago four men would discharge 20 to 25 tons per hour; with five men now the average is 12 to 15 tons.

Loss in weight may be put on the average at 2 per cent. for hard coal and 5 to 7 per cent. for lignites, in the latter case due mainly to evaporation. On coals screened in the yards there is additional loss, but the yard-screening has ceased since the shortage became acute last winter. There is also occasional pilfering on the railway, but it is not regarded as a serious element in cost.

Complaint was made that the cost of distributing Kaitangata coal in Christchurch in 1918 was unduly high, as the mine was selling only through an agent, and this agent was charging £2 5s. per ton bagged, ex truck, or 3s. more than the mine-cost plus railage. The practice of selling through one agent was begun in May, 1918, and continued till October, and was amply justified by the shortage necessitating the appointment of a sole agent to divide up the few truck-loads available per week among the local dealers. The 3s. difference is accounted for mainly by the wages of two men employed by the agent to bag the coal and load the carts, and by the loss in weight *en route* from the mine, averaging about $\frac{1}{2}$ cwt. a ton.

It is worthy of note that coal of the best household quality from the Reefton or Inangahua Coalfield, which is one of the most extensive in the Dominion, can be landed in Christchurch under present conditions at a cost much the same as that of the Kaitangata coal. As mentioned elsewhere in this report, the development of these fields merits the attention of the State.

(d.) *Lignites*.—Lignite coals of varying quality are available in Christchurch with ex truck prices ranging from £1 8s. 3d. (Mataura) to £2 4s. (Kaitangata). The railage forms a large proportion of the total landed cost of these coals, in most cases ranging from one-half to two-thirds. The dealers have to allow more for loss of weight and cartage expenses on these coals; and their prices have advanced at a much higher rate than those of other coals, for the further reason that consumers' demand in regard to them has been less elastic: householders have been willing to pay the greatly increased prices rather than suffer the only alternative of no supply at all. Dealers get a gross profit of about £1 a ton on such coals (out of which to reimburse them for all costs of storing and delivery), but this trade has not been so extensive as to provide them with an undue net rate of profit on their whole turnover, as the coals have found a ready market in their own district. In order to eke out the short supplies of the better coals the Munitions and Supplies Department has latterly compelled all dealers to include a certain amount of lignite as an essential part of every household order. If this had not been done the prices of all the better coals would have been raised still higher than they have been.

(e.) *Australian Coal*.—The wholesale price of Newcastle coal ex ship at Lyttelton in September, 1918, was £1 16s. 6d. per ton, an advance of 13s. per ton, or 55 $\frac{1}{2}$ per cent., on the price in August, 1914. The price is made up as follows:—

TABLE 56.					1918.	1914.
					s. d.	s. d.
Coal f.o.b. at Newcastle per ton ..	..	..	..	..	15 0	11 0
Freight to Lyttelton ..	..	..	..	..	16 6*	10 6
Insurance ..	..	..	..	..	0 2	0 8
Primage ..	..	..	..	..	0 2	
Weighing ..	..	..	..	..	0 2	
Exchange ..	..	..	..	..	0 0 $\frac{1}{2}$	
Loss in weight (2 per cent.) ..	..	..	..	..	0 3 $\frac{1}{2}$	
Overhead charges ..	..	..	..	..	0 3	
					32 7	22 2

This leaves 3s. 11d. a ton out of which to provide rent, travelling-expenses, &c., as well as profit. These expenses have increased greatly per ton, owing to the diminished turnover. The importations of the wholesale firms have been reduced since 1914 by two-thirds. This reduction has been due not to the lack of coal in Australia, but to the shortage of shipping. The Government demand for railway purposes takes precedence of all other requirements. This means that the proportion of the total supply of Australian coal now available for ordinary trade purposes is much less than in 1914—*e.g.*, one firm imports only one-third of the amount received in 1914, and the railways take one-half of the importation instead of one-tenth as in 1914. The gross profit per ton on the trade in railway coal was 6d. before the war and up to 1917, when it became 9d.; after the 1st September, 1918, it has been 2s. 6d., the price paid by the Government being £1 14s. Out of the 2s. 6d. the charges for shortage in weight, insurance, exchange, &c., are defrayed.

The retail net cash price of Australian coal is £2 18s. as against £1 19s. in 1914, an increase of nearly 49 per cent. *The chief increases in retailers' costs appear to have been—*

					s. d.
Coal ex ship ..	..	..	..	..	13 0
Railage ..	..	..	..	..	1 0
Discharging ..	..	..	..	..	0 3
Duty (primage) ..	..	..	..	..	0 2
Sacks ..	..	..	..	..	0 6
Cartage ..	..	..	..	..	2 9
Loss in weight ..	..	..	..	..	0 3
Office expenses ..	..	..	..	..	1 6
Other charges ..	..	..	..	..	1 7

* 17s. 6d. if by Melbourne Steamship Company.

(f.) *Increases in Cost of conducting a Retail Business.*—These generally have reached the amount mentioned in the last paragraph, and are due to increases in the cost of the coal ex ship or mine, in freight and railage, in the wages of yardmen and carters, in the cost of horse-feed, and of repairs and maintenance, and in the general expenses of the business. The rise in the per ton cost became steeper also from the fact of the mere decrease in the supplies of coal.

The increases in the retail prices have generally been greater than those in the wholesale price. The increase in the wholesale cost to the retail dealer consists of higher f.o.b. cost at the mine and rises in freight; these are in course of time passed on to the consumer, in addition to any extra cost in carrying on the retail business itself. In the case of a bituminous coal largely used for house purposes in Christchurch, the wholesale price at Christchurch has increased by 10s. 8d., or 34 per cent. over the period 1914–18, whilst the retail price has risen by 15s., or 38·5 per cent., the extra 4s. 4d. being made up of increases for cartage, yard expenses, sacks, &c.

The changes in the retail prices have been fixed mainly by the North Canterbury Coal Merchants' and Dealers' Association, which issues a schedule of prices of coal of all grades for varying quantities; but the association's prices are not adhered to by all dealers. There is effective competition in regard to price. Some influential dealers broke from the association because its price-level seemed to them too high, others again because its prices were not considered high enough to provide a decent livelihood; prices may be 3s. lower than the association's or 4s. higher. On one or two occasions proposed increases of price have been abandoned by the association because of the opposition of the larger dealers or mine agents. We have had convincing evidence that the agents of at least two important mining companies have taken steps to protect the Christchurch consumer against an increase in the retail price by the distributors.

(g.) *Profits.*—The pressure towards increase of the retail price has been incessant because of the rapidly mounting cost of working, especially in the case of businesses on the small or middling scale, which are in the majority. The larger merchants admit that their costs, particularly their cartage costs and their overhead charges, are much lower per ton than those of their smaller competitors. For these reasons, and the fact that they can get only a very small share of the non-house trade—e.g., the supply of coal to dairy factories, foundries, hotels, and boardinghouses, where the coal may be carted loose, and the demand continues throughout the year—the smaller merchants desire to fix the price for house coal at a level higher than would be necessary to give an adequate net return to the large dealer. “We could reduce the price to the public by selling from the depot, but we would drive the small man out of business,” said one of the larger dealers. The obvious suggestion that the size of the normal coal-distributing business should be increased will be dealt with later. We are here concerned only with the trade as it exists to-day, and the evidence put before us clearly shows that *the majority of the coal-retailers have been making quite inadequate profits*, despite the increase in the retail price of coal, because prices have scarcely kept pace with the costs of the majority of businesses. Five or six retailers went out of business in Christchurch during 1917–18 through financial losses. A careful, hardworking man can hope to get but a bare living out of his business unless it be on a large scale. To quote from the evidence, “There is one yard that we are running for a man away at the front. I have taken out that balance twice, and the average that that man can make is about £4 per week—£5 at the very outside, for which he has to work all hours. He has to keep his own books and do his own horse-grooming. He turns over 500 to 600 tons a year. In another place with a turnover of about 600 tons I have taken their balance-sheet out repeatedly during the last ten years, and the average earnings for those ten years are not beyond £3 10s. a week. They are in the association, and abide by the association prices.” A large part of any profit that may be made is accounted for by unclaimed discounts, only comparatively few customers paying cash. Yard expenses, including cartage in and out, are heavy, and even wholesalers, unless equipped with labour-saving appliances, prefer to operate without a yard. “Unless you work a yard yourself,” said a witness in the wholesale trade, “you cannot make it pay. . . . It (profit) depends on the price at which they are debiting their yard with the coal. When we had a yard we debited it with the c.i.f. cost, and then we could not make it pay. . . . If we had that yard to-day we should be worse off. We should have a smaller turnover, and the same rent and yard expenses to pay. Most of the smaller men run their own yards, and they are just getting their labour out of it.” *The State depot at Christchurch*, though free from some of the costs borne by private dealers, makes the whole of its profits from the wholesale ex ship business, the retail business being conducted at a loss. The ex ship prices of the different classes of State coals have increased from 29 to 62½ per cent. over the period 1915–18, whilst the rate of profit has increased, except in the case of small coal, in greater proportion.

TABLE 57.—INCREASE IN PRICE EX SHIP, WHOLESALE, OF STATE COALS AT LYTTELTON, 1915–18.

State Coal.	Increase in Price, 1913–18.	Increase per Cent.	Rate of Profit.	
			Per Cent., 1913.	Per Ton, 1918.
	s. d.			
Screened	9 0	35½	13½	30
Unscreened	10 6	50	9½	21½*
Point Elizabeth, small	10 0	62½	18½	10†
Liverpool, small ..	6 6	29	66½	13
	(1916–18)			11

* Point Elizabeth.

† Liverpool.

Ex ship sales accounted for more than half of the turnover in 1917.

The retail price of State coal (screened for house purposes) increased only 7s. 6d., or 22 per cent., over the period 1914–18, an increase insufficient to counterbalance the rise in the prime cost of the coal, and in the expenses of retailing it. *The fact that State coal is sold at a lower price than other coals is therefore in itself no proof that the private dealers are making undue profits on these*, even if allowance be made for the difference in the prime costs.

(h.) *Suggested Improvements.*—Some important suggestions were made by witnesses at Christchurch ; these are referred out in Chapter VIII, section 3.

(v.) DISTRIBUTION AT DUNEDIN.

(a.) *General.* The chief house coals marketed in Dunedin come oversea from Westport and Newcastle, and by rail from Kaitangata, Taratu, Waronui, and other lignite-mines of minor importance. There are about seventy coal-merchants trading in Dunedin and suburbs. There is a Coal-merchants' Association, which consists of thirty-four members, chiefly smaller dealers. There is no differential treatment of non-members of the association by the mines. Trading is, as in other centres, both wholesale and retail. The price charged is either cash, or less 1s. discount if paid by the 20th of the month following purchase. The general process of distribution is much the same as in other centres, already described. The coal is sometimes bagged at the truck and sometimes carted loose to the retailer's yard. The predominant order in Dunedin appears to be half a ton. As much as 5 tons a day may be delivered within a mile of a retailer's yard by one man. Two prices are quoted, a price for the city and a price for the hills. The hill rates are generally 2s. 6d. higher than the city rates. No State coal is marketed in Dunedin.

The following is the cost of carriage of the chief coals to the railway-station, Dunedin :—

TABLE 58.

						1918.	1914.
						s. d.	s. d.
Kaitangata	..	..	..	..	..	6 7	5 5
Taratu	..	..	..	..	..	6 1	4 11
Waronui	..	..	..	..	..	5 2	4 3
Lignites	..	..	..	..	..	2 2	1 9
Westport (shipping freight only)	..	..	..	..	..	11 6	7 6
Newcastle (shipping freight only)	..	..	..	..	..	18 6	11 6

(b.) *Prices.*—Table 59 gives a comparison of the net cash retail prices of the chief house coals sold in Dunedin for the years 1914 and 1918.

TABLE 59.—NET CASH RETAIL PRICE OF HOUSE COAL, 1914 AND 1918.

Year.				Kaitangata.	Taratu.	Waronui.	Lignites.	Westport.	Newcastle.
				s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
1914	..	..	..	30 6	21 6	22 6	19 6	36 0	37 0
1918	..	..	..	44 0	31 0	33 0	27 0	53 6	54 0
Increase per cent.	..	..	..	44½	44	46½	38½	48½	46

There is an evenness in the rate of increase ; the lignites are still the cheapest, and Australian the dearest, coals.

Table 60 shows the dates and amounts of the various increases in the retail prices over the period in question. There have been nine different increases—one in September, 1915, three in 1916, two in 1917, and three in 1918. The total increase varies from 7s. 6d. a ton, or 38½ per cent., in the case of lignites to 17s. 6d., or 48½ per cent., in the case of the Westport coals.

TABLE 60.—SHOWING THE AMOUNTS AND DATES OF THE VARIOUS INCREASES IN CASH RETAIL PRICES OF HOUSE COAL AT DUNEDIN FOR THE PERIOD 1914 TO 1918, AND THE TOTAL INCREASE PER CENT.

Coal.	1914-15.	Sept., 1915.	May, 1916.	July, 1916.	Dec., 1916.	April, 1917.	June, 1917.	Feb., 1918.	Aug., 1918.	Oct., 1918.	Total Increase.	Increase Per Cent.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	
Kaitangata	.. 30 6	31 3	36 3	37 3	37 9	40 9	42 6	43 0	43 0	44 0	13 6	44½
Nightcaps	.. 26 0	27 0	..	29 6	..	..	..	..	..	..	..	..
Taratu	.. 21 6	22 0	24 6	25 6	26 0	26 0	28 6	29 0	31 0	31 0	9 6	44
Waronui	.. 22 6	23 0	25 6	26 6	27 0	29 0	30 0	31 0	32 0	33 0	10 6	46½
Westport	.. 36 0	..	38 0	41 6	44 6	46 6	50 6	51 0	53 6	53 6	17 6	48½
Australian	.. 37 0	..	39 6	41 6	48 0	48 0	52 0	52 0	54 0	54 0	17 0	46
			(Jan.)									
Lignites	.. 19 6	19 9	21 6	22 6	23 0	25 0	26 0	26 0	26 0	27 0	7 6	38½

Table 61 shows the increases in the retail cash price of house coal per ton at Dunedin, 1914 and 1918, detailing the amount of increase due to each cause.

TABLE 61.—INCREASE IN RETAIL CASH PRICE OF HOUSE COAL PER TON AT DUNEDIN, 1914–18, SHOWING AMOUNT OF INCREASE DUE TO EACH COST.

Kind of Coal.	Railage.	Increase Per Cent.	Per Cent. of Total Increase.	Mine-price Increase.	Increase Per Cent.	Per Cent. of Total Increase.	Retailers' Charges. Increase.	Increase Per Cent.	Per Cent. of Total Increase.	Total Increase.
	s. d.			s. d.			s. d.			s. d.
Kaitangata ..	1 2	21	9	10 10	60	80	1 6	20	11	13 6
Taratu ..	1 2	21	12	6 10	49	73	1 6	20	15	9 6
Waronui ..	0 11	21	9	5 7	36	53	4 0	53	38	10 6
Lignites ..	0 5	21	6	5 3	44	70	1 10	24	24	7 6
Westport ..	4 0	53½	23	11 6	40	66	2 0	29	11	17 6
	(freight)			(including 6d. railage)						
Newcastle ..	7 0	61	41	..	..	..	..	..	..	17 0

The increase in the mining-cost is responsible for by far the greater part of the increase in the retail price in Dunedin. Retailers have been responsible for about a quarter of the rise, except in the case of Waronui coal, which has borne an extra share of retailers' increased costs.

The prime cost to retailers of the different coals has therefore increased—Kaitangata by 12s., Taratu by 8s., Waronui by 6s. 6d., lignites by 5s. 8d., Westport by 15s. 6d. These increased costs they have sought to recoup by raising the price of each coal by at least as much, but the costs of their own businesses, besides the prime cost of the coal, have increased. These increases have been most in the case of labour, sacks, horse-feed, harness, and wheelwright repairs. The wages of yardmen have increased 13s. 3d. per week, and the hours have diminished by four per week, equivalent to an increase in cost of 5s. 9d., making a total real increase of 19s. a week in the labour-cost. The wages of carters have increased at least 12s. a week. There is no evidence that increased efficiency has accompanied the rise in labour-cost. Employers complain that the men are doing less work although getting more money. It is estimated that the wages increase is equivalent to from 10d. to 1s. a ton on the average over all coals traded in; and the increased cost of bags, horse-feed, shoeing, harness, repairs to carts and harness, probably accounts for another 1s. a ton.

(c.) *Costs.*—The estimates of the cost of handling given us varied, but a margin of about 9s. between the prime cost and the retail price is required before a net profit emerges beyond the dealer's own wages or salary and his depreciation charges. Cartage to the yard may be put at 1s. 6d. a ton; depreciation, including sacks, 1s. 6d.; office expenses, rents, rates, taxes, 1s.; loading and delivering, 4s. 6d.—a total of at least 8s. 6d. The smaller dealers estimate filling and cartage to yard at 3s.; yard labour, sacks, and office expenses at 3s.; and delivery and depreciation at 5s.: a total of 11s.

(d.) *Profits.*—The actual margins or gross profits were as follows:—

TABLE 62.

—				Kaitangata.	Taratu.	Waronui.	Lignite.	Westport.
				s. d.	s. d.	s. d.	s. d.	s. d.
1914	..	..	..	7 6	7 6	7 6	7 6	7 0
1918	..	..	..	9 0	7 6	7 6	8 10	9 0
Increase	..	..	..	1 6	..	..	1 4	2 0

In the case of Taratu and Waronui no truck lots have been available during the 1918 shortage, thus increasing the cost of the coal to the retailer by 1s., and preventing a rise in his gross profit.

The actual increase in retailer's costs as estimated for smaller dealers amounts to:—

				s. d.
Filling and cartage to yard	..	..	..	0 6 per ton.
Office, yard labour, sacks, &c.	..	..	..	1 0 „
Delivery to consumer and depreciation	..	..	..	1 0 „
Total	..	..	..	2 6 „

The dealers maintain that to obtain a profit they should charge 2s. or 3s. a ton more than the ruling prices, and it is certain that the particular part of the increase in retail price due to dealers' own costs is less in Dunedin than in any other large centre. Several businesses have been taken over by other firms in Dunedin during the past two or three years, the main reason being that the owners were losing on their trade through the shortage of supplies. A business with a turnover of several thousand tons reported a net profit of only £6 for the last year.

(e.) *Suggestions for improvement* and several complaints made to us at Dunedin are dealt with in Chapter VIII, section 3.

(vi.) DISTRIBUTION AT INVERCARGILL.

(a.) *General.*—The chief coals used for house and general purposes are Nightcaps, Wairio, and Kaitangata. Westport is also used and Newcastle in normal times. A number of low-class lignites are in considerable demand during times of shortage. The railage on coal to Invercargill changed as follows :—

TABLE 63.					1914.	1918.
					s. d.	s. d.
From Kaitangata	..	..	..	..	7 2	8 9
„ Wairio	..	..	..	..	4 9	5 9
„ Nightcaps	..	..	..	..	4 11	6 0
Lignites	..	..	..	..	3 11	4 9
Freight from Westport to Bluff	..	..	..	..	8 0	12 0
„ Newcastle	..	..	..	..	11 6	18 6

The wharfage at Bluff is 1s. 6d., and the railage, Bluff to Invercargill, 4s. on New Zealand bituminous and 2s. 11d. on brown coal.

Distribution is in the hands of about thirteen dealers, some of whom deal almost solely in coal. These dealers purchase from the mines and retail to consumers. There is very little wholesale trade. Those requiring coal in large quantities for industrial and other purposes buy direct from the mines. The coal is railed direct to Invercargill, and carted from the station to the coalyards. The methods of delivery are much the same as those in other centres. Prices are for cash, for payment the month following delivery, and credit. There is a difference of 4s. between the cash and credit prices; 5 per cent. is taken off for payment within a month. About half the orders are for cash, the remaining trade being divided between monthly discount and credit. The Coal-merchants' Association comprises all those engaged in the coal trade in Invercargill and fixes the retail prices. No State coal is marketed in Invercargill.

(b.) *Prices.*—The following table states the position in October, 1918, in regard to retailers' prime costs, prices, and gross profits :—

TABLE 64.—STATEMENT SHOWING PRIME COSTS AND GROSS PROFITS IN A RETAIL COAL BUSINESS AT INVERCARGILL.

Kind of Coal.	Cost Price, Invercargill Rail- way-station.	Retail Cash Price.	Gross Profit.	Retail Credit Price less 5 per Cent. Discount.	Gross Profit.
	£ s. d.	£ s. d.	s. d.	£ s. d.	s. d.
Westport coal	2 3 2	2 14 6	11 4	2 15 7	12 5
Kaitangata coal	1 17 3	2 6 6	9 3	2 8 0	10 9
Wairio coal	1 9 9	1 19 6	9 9	2 1 4	11 7
Nightcaps coal	1 3 0	1 12 6	9 6	1 14 8	11 8
Nightcaps nuts	0 14 6	1 4 6	10 0	1 7 1	12 7
Lignite	0 14 0	1 3 6	9 6	1 6 1	12 1
Coke	1 10 0	1 16 0	6 0	1 16 7	6 7

These margins are greater than those quoted for Dunedin on page 52. Businesses in Dunedin are on a larger scale and depend to a less degree for their total profits on their coal trade.

Table 65 analyses the cost as shown in the first column of Table 64 into mine-cost and transport-cost.

TABLE 65.—ANALYSIS OF COST AT INVERCARGILL RAILWAY, OCTOBER, 1918.

Kind of Coal.	Cost of Coal.	Sea Freight, Railage, and Wharfage.	Total.
	£ s. d.	s. d.	£ s. d.
Westport	1 15 9*	12 0 freight 3 11 railage 1 6 wharfage	2 3 2
Kaitangata	1 8 6	8 9	1 17 3
Wairio	1 4 0	5 9	1 9 9
Nightcaps	0 17 0	6 0	1 3 0
Lignite	0 9 3	4 9	0 14 0

* Including 2s. 10d. or 3s. West Coast railage.

Transport charges account for about a quarter of the retail price of the standard house coal in this centre.

The next table shows *the changes in the price over the period under review.*

TABLE 66.—INCREASES IN RETAIL CASH PRICES OF HOUSE COAL, INVERCARGILL.

Kind of Coal.	August, 1914.	October, 1918.	Total.	Increase, per Cent.
	£ s. d.	£ s. d.	£ s. d.	
Kaitangata	1 8 0	2 6 6	0 18 6	64
Nightcaps	1 2 0	1 12 6	0 10 6	48
Wairio	1 4 0	1 19 6	0 15 6	64

The main part of the increase is due to the increased cost of mining. The next table shows the proportional parts of the increase due to each factor.

TABLE 67.—APPORTIONMENT OF INCREASE IN RETAIL CASH PRICE, 1914, TO OCTOBER, 1918.

Kind of Coal.				Mine Increase.	Percentage of Total Increase.	Rail Increase.	Percentage of Total Increase.	Including Retail Charges.	Percentage of Total Increase.	Total Increase.
				s. d.		s. d.		s. d.		s. d.
Kaitangata	..	..	..	15 6	84	1 7	9	1 5	7	18 6
Nightcaps	..	..	..	7 0	67	1 1	10	2 5	23	10 6
Wairio	..	..	..	11 10	77	1 0	6½	2 8	16½	15 6

The retailers increased their cash price by 2s. per ton, made up of 1s. from 4th December, 1916 (wages to drivers), and 1s. from 24th March, 1917 (owing to increased expenses), and, in addition, obtained 5d. from Nightcaps and 8d. from Wairio. (See next table.)

Table 68 shows how the various increases were distributed over the period, and analyses them in detail.

TABLE 68.—TABLE SHOWING INCREASES UNDER DIFFERENT HEADINGS OF COST OF COAL TO RETAIL DEALERS AT INVERCARGILL, AND THE DATES OF EACH INCREASE, 1915-18.

Kind of Coal.	Railage.		Mine Increase.															
	Sept., 1915.	Nov., 1917.	1916.								1917.							
			Feb.	March.	April.	May.	July.	Dec.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Dec.
Kaitangata	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Nightcaps	0 9	0 10	2 6	..	..	..	2 6	..	..	3 0	..	..	..	2 0	..	1 0	1 6	..
Wairio	0 6	0 7	..	..	..	1 0	..	..	..	..	..	..	..	..	..	..	..	..
Westport	0 6	0 6	..	1 0	..	..	..	1 10	..	..	1 0	..	2 0	..	..	..	1 0	1 0
Lignites	..	..	..	..	..	..	2 0	..	..	..	2 0	..	..	..	..	..	..	..
Newcastle	..	..	..	..	..	..	..	..	6 0	..	..	..	..	..	..	..	..	..

Kind of Coal.	Mine Increase.					Drivers' Wages increased, December, 1916.	Increased Expenses, March, 1917.	Total Increase in Cost.	Total Increase in Retail Price.
	1918.								
	April.	May.	June.	July.	Sept.				
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Kaitangata	..	5 0	..	..	1 0	1 0	1 0	19 1	18 6
Nightcaps	..	..	2 0	..	1 0	1 0	1 0	10 6	10 1
Wairio	..	2 0	..	..	2 0	1 0	1 0	14 10	15 6
Westport	1 0	..	..	..	..	1 0	1 0	10 0	..
Lignites	..	..	..	1 0	..	1 0	1 0	7 0	..
Newcastle	..	..	..	..	..	1 0	1 0	..	..

In addition, all credit prices increased 1s., June, 1915 ; 6d. April, 1918 : total, 1s. 6d.

TABLE 69.—INCREASE IN MINE-COSTS, 1913-18, COMPARED WITH INCREASES IN THE MINE-PRICE.

Mine.				Increase in Mine-cost of all Coal.	Increase in Average Selling-price of all Coal.	Increase in Mine-price of House Coal.	Percentage which House Coal is of Total Supply.
				s. d.	s. d.	s. d.	
A	..	..	..	7 6	8 2½	15 6	66 to 70 (approximately).
B	..	..	..	4 0½	3 1½	7 0	66 to 70 (first and second coal).

(c.) Costs.—The present cost of delivery of coal in Invercargill is estimated at 8s. 6d.

TABLE 70.

	s. d.
Bagging	1 0
Cartage to yard	2 0
Delivery to consumer	4 0
Weighing, sacks, rent, rates, office and other expenses	1 6
Total	8 6

No allowance is made for depreciation. This represents an increase on the cost for 1914, chiefly because of increased wages, horse-feed, and increased expenses in maintaining gear. The Progress Co-operative Society analysed its cost for one week in September and found it to be 7s. 6d. a ton.

The society pays high wages—£3 3s. to £3 8s. a week—as well as giving half a ton of coal per month to each man. Its secretary stated that its expenses are lower than those of any coal-merchant in Invercargill. No charge for management was included.

(d.) *Profits.*—The gross profits to the retailer on the cash price in Kaitangata are about 9s. 3d. per ton, in Wairio 9s. 9d., and in Nightcaps 9s. 6d. On the monthly credit trade these profits are for Kaitangata 10s. 9d., Wairio 11s. 7d., and Nightcaps 11s. 8d. The expenses of the trade have been shown to be at least 8s. 6d. If we take the largest business, doing an annual turnover of about 2,500 tons, the difference between expenses and gross profits would approximate a little over £300, made up as follows: 1,250 tons at 1s., £62 10s.; 625 tons at 3s., £93 15s.; 625 tons at 5s., £156 5s.: total profit, £312 10s., less an unknown amount for unpaid and unduly deferred debts. This sum *cannot be regarded as excessive remuneration* for the retailer's own labour and trouble, or as containing any considerable element of pure profit.

Two coal-retailers have recently gone out of business in Invercargill through financial loss.

(e.) *Suggestions for Improvements.*—Witnesses in this town expressed the opinion that if there were fewer dealers and a larger and more regular supply of coal the distributing-cost per ton could be reduced.

The following tables summarize the changes in the retail prices of household coal at the different centres in comparative form, with allocation to the different heads of costs, and the estimates of the actual cost of delivery from the retailer's yard to consumer about September, 1918:—

TABLE 70A.—COMPARATIVE TABLE SHOWING TOTAL INCREASE IN THE CASH RETAIL PRICES OF STANDARD HOUSEHOLD COALS DURING THE PERIOD 1913-18, WITH DIVISION INTO ITS SEVERAL PARTS.

Place.	Rise in Cost at Mine.	Rise in Transport.	Rise in Retailers' Charges.	Increase in certain Wholesale Charges.	Total Increase.
	s. d.	s. d.	s. d.	s. d.	s. d.
Auckland (to September, 1918) ..	5 6	1 7	1 8	..	8 9
„ (after September) ..	7 6	1 7	4 11	..	14 0
Wellington ..	4 6	4 7	4 6	0 5	14 0
Christchurch (Kaitangata) ..	9 10	2 4	7 10	..	20 0
„ (Homebush) ..	11 0	1 4	6 8	..	19 0
„ (Westport) ..	4 6	4 9	5 0	0 9	15 0
Dunedin ..	10 10	1 2	1 6	..	13 6
Waronui ..	5 7	0 11	4 0	..	10 6
Taratu ..	6 10	1 2	1 6	..	9 6
Invercargill ..	7 0	1 1	2 5	..	10 6

TABLE 70B.—COMPARATIVE TABLE SHOWING COST OF DELIVERY FROM YARD TO CONSUMER AT DIFFERENT CENTRES.

Auckland ..	..	..	..	6s. to 7s. 9d.
Wellington ..	..	..	..	6s. 6d. to 8s. 7d.
Christchurch ..	..	..	..	4s. 7d. to 8s. 6d. (average about 6s. 6d.)
Dunedin ..	..	..	..	4s. 6d. to 5s.
Invercargill ..	..	..	..	4s.

CHAPTER IV.

PRICES AND PROFITS IN THE COAL INDUSTRY AND TRADE.

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1. PROFITS IN MINING.

(i.) DIFFERENCE BETWEEN COST AND SALE PRICE.

THE profits of an industrial enterprise are constituted by the excess of the income over the outgoings. In the case of coal-mines outgoings are the aggregate expenses of producing the coal to the point of delivery to the wholesale or retail buyer, and income the funds obtained by the total sales of coal for the same period as that for which the expenses are reckoned. The cost of production of the coal has already been shown in Table 16. Table 71 shows the average price per ton actually obtained by the mine-owner, with the rate of increase in this price over the war period. It should again be noted that the figures are comparable horizontally, but not vertically, since the several mines are at different stages of development, working often under different conditions and not all producing the same kind of coal.

TABLE 71.—AVERAGE NET SELLING-PRICE PER TON OF COAL AT MINE OR F.O.B. OR F.O.R. AT CUSTOMARY SHIPPING-POINT.

Mine.	1913.	1914.	1915.	1916.	1917.	1918.	Increase.	Increase per Cent.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	
A	8 11·125	8 9·625	8 6·5	8 9·5	9 6·625	12 1·5	3 2·375	47
B	13 8·05	13 7·62	13 7·78	17 5·78	21 0·4	21 10·64	8 2·59	60
C	..	16 1·43	13 11·95	17 4·7	17 1·38	23 3·34	7 1·91	44·5 (five years).
D	..	9 10·5	9 3	9 4	10 10	11 5·3	1 6·8	15·9 (five years).
E	..	..	10 2·7	11 4·5	12 7·6	13 2·6	2 11·9	29·25 (four years).
F	..	9 9·2	9 6·4	8 9·1	9 7·8	11 7·9	1 10·7	19·4 (five years).
G	11 0	11 8	12 0·75	12 1	14 0·25	16 7	5 7	50·8
H	16 0	17 0	17 0	18 3	20 0	24 0	8 0	50
I	..	..	..	..	..	..	..	..
J*	12 9·95	12 4·73	12 10·46	12 6·84	14 1·29	15 6·23	2 8·28	21
K*	..	..	12 5·69	11 2·6	13 8·63	16 1·8	3 8·11	30 (four years).
L	..	..	..	14 6	17 6	17 10	3 4	23 (three years).
M	12 7	12 7	12 8	13 10	15 0	18 6	5 11	47
N	13 4·68	12 9·3	12 3·1	14 2·18	15 9·38	17 0·08	3 7·4	27
O	16 11·09	17 3·36	16 9·02	17 6·23	20 10·38	24 0·32	7 1·2	42

* State mines.

The average selling-price has increased in every case; the lowest price being 15·9 per cent. (five years), 21 per cent. (six years); the highest 60 per cent. The two mines with returns for the last four years only show practically the same increase, 29½ and 30 per cent., though situated on different fields. The highest increases in selling-prices, both relatively and absolutely, are shown by the semi-bituminous coals of the North and the brown coals of the South, which have advanced by about 50 per cent. or from nearly 6s. to 7s. a ton on the average. The brown coals of the Waikato district have advanced by about only half that amount, though the percentage rise is a little more than half. The bituminous coals of the West Coast have risen on the average by about a third, or nearly 5s. per ton.

If the increase in the average selling-price for the industry as a whole be calculated from the available data in the same manner as the increase in the cost of production (see above, p. 26), it is found that the selling-price of those mines for which data are available over the whole period of 1913–18 increased, when due allowance has been made for relative outputs, by 36 per cent.—i.e., from about 14s. 3d. to 19s. 5d. per ton. This figure is to be compared with that showing the increase in total cost of production—viz., 37 per cent.*

* The comparison is with the increase of 37 per cent., not with that of 41 per cent. (see p. 26), since the mining companies have to pay out of their selling-prices the cost of haulage from the mines to shipping-ports.

When we compare the selling-prices of all coals for which exact details were available in each year, whether from collieries working over the whole period or not, the increase in selling-price is 22 per cent. This figure, however, as in the case of cost of production, does not give a true measure of the change of the price of all coal, since the selling-prices and cost of the mines for which exact particulars were not available for 1913 were on the average lower than those of the mines providing data for that year.

This figure was lower during 1914–15–16 than in 1913. In 1916–17 it rose 11 per cent. above the 1913 level, and in 1917–18 22 per cent. *The selling-price of bituminous coal increased 35 per cent. (3s. 2d.) during the period, though the cost rose 40 per cent. ; that of semi-bituminous coal rose 34 per cent. (5s. 7d.), or slightly more than its cost ; that of brown coal 22 per cent. (2s. 7d.), as against a rise of 25 per cent. in cost.* The increase in the price of brown coal for 1917–18 when compared with 1913–14 (a better basis of comparison in view of the incomplete data for brown-coal mines for 1913) is 30 per cent. (3s. 1d.), the corresponding increase in cost of production being 31 per cent.

The difference between the mine selling-price and the cost of production in each case for each year is set out in Table 73, which also expresses the difference as a percentage of the cost of production.

TABLE 73.—MINE-PROFIT PER TON, ALSO EXPRESSED AS PERCENTAGE OF TOTAL COST PER TON.

Mine.	1913.	1914.	1915.	1916.	1917.	1918.	Increase or Decrease between Earliest and Latest Years.	Annual Average Profit per Ton.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
A	1 4.86	1 1.94	1 3.38	0 9.58	1 5.8	0 8.55	-0 8.31†	1 1.68
	9	5½	8	4½	7½	3½		
B	0 10.25	1 3.88	1 0.87	1 7.74	1 4.07	0 9.64	-0 0.161†	1 2.07
	6½	11½	9½	13	9½	4½		
C	-0 2.5†	1 0	1 0	0 10.4	-0 7†	2 0.4	1 9.9	0 8.2
	-1½†	8½	8½	6½	-3½†	12½		
D	..	..	..	-2 8†	-1 0†	-0 5.5†	2 2.5	1 4.5 (loss).
				-15†	-5½†	-2½†		
E*	..	..	-1 8.55†	-1 7.92†	0 1.97	0 9.81	+2 6.36†	0 7.17 (loss).
			-12†	-13†	1½	4		
F*	-0 8.04†	-1 7.56†	-0 0.24†	1 3.86	2 11.63	4 2.93	+4 10.97†	1 0.43
	-5†	-11½†		11½	26	38		
G	1 7.18	0 9.5	0 1.22	0 2.96	0 7.14	1 4.39	-0 2.79†	0 9.39
	11	5	¾	1½	3	6		
H	-1 4.5†	1 4.5	0 4.5	0 3	-5 9.25†	1 1.75	+2 6.25†	0 8 (loss).
	10	13	3	2½	-29†	8		
I	..	0 9.7	0 1	-0 7†	0 6	1 1.3	+0 3.6†	0 4.6
		9	½	-6½†	5½	10½		
J	..	..	..	..	..	2 2.7	..	..
						19		
K	..	1 6	1 5	0 9.25	1 1	0 10	-0 0.8†	1 1.45
		18	18	9	11	7½		
L	0 2.62	0 7.24	0 1.27	0 4.3	0 2.61	0 11.15	+0 8.53†	0 4.87
	1½	4½	¾	2	1	4½		
M	..	0 1.02	-6 9.44†	-0 2.74†	-0 6.18†	-2 2.87†	-2 1.85†	1 11.44 (loss).
		¾ (ap.)	-33†	-1†	-3†	-8†		
N	2 5.625	1 9.875	1 8.875	2 1.875	1 2.125	1 7.25	-0 10.375†	1 9.93
	38½	26½	25½	32½	14	15½		
Highest (to nearest penny)	2 6	1 10	1 9	2 2	3 0	4 3	4 11	1 10
Lowest (to nearest penny)	-1 5†	-1 8†	-1 9†	-2 8†	-1 0†	-2 3†	-2 2†	1 11 (loss)

* State mines. † Decrease. ‡ Increase.

The lowest and highest margins between cost and price were :—

TABLE 74.

	Lowest.	Highest.
	s. d.	s. d.
1913	-1 4.5	2 5.625
1918	-2 2.87	4 2.93

Seven mines get a larger margin in 1918 than in the earliest year quoted by a total of 15s. 5.11d., or an average of 2. 2.4d., whilst six mines get a lower margin by 4s. 0.28d., or an average of 8.05d. The highest and lowest margins are shown by a different mine each year. The two largest increases in the margin of profit are those of the State mines, though the returns of one of them, the Liverpool mine, are compared over the last four years only. *Generally speaking, the decreases in the mine-profit per ton are more significant and typical of the whole output of the period than the increases.* The average annual profit per ton shows a range from 1s. 10d. gain to 1s. 11d. loss.

If the properly weighted average selling-price be compared with the corresponding average cost of production for the mines giving returns for the years 1913–18 *the margins between cost and price are 9d. and 10d. a ton for 1913 and 1918 respectively*, or 5.6 and 4.5 per cent. of the cost of production. *A comparison of the similar margins for all mines giving data, whether over the whole period or not, shows a reduction from 9d. to 5d. a ton, the latter representing 2.2 per cent. of the average cost.*

The next table compares the percentage increases in the selling-prices with those in the total cost of production at the separate mines. *These generally moved together except where the price lagged behind*

costs. The mean increases for the mines, giving returns over the whole period 1913-18, are about the same for cost and sale price—viz., 5s. 10d. and 5s. 9d.

TABLE 75.—COMPARISON OF INCREASES IN MINING-COST AND SELLING-PRICES AT MINE, 1913-18.

Mine.	Increase in Total Mine-cost to Nearest Penny.	Increase in Average Selling-price.	Increase in Mine-cost, per Cent.	Increase in Selling-price, per Cent.	Remarks.
	s. d.	s. d.			
A	7 10	7 1	50	42	
B	3 8	3 7	29	27	
C	3 2	5 11	32	47	
D	1 1	3 4	17	23*	1916-18 only.
E†	1 2	3 8	8	30	1915-18 only.
F†	-2 3‡	2 8	-20‡	21	
G	6 11	..	64	..	
H	8 3	8 0	57.2	50	
I	2 0	5 7	16	51	
J	1 7	1 11	18	19	1914-18 only.
K	..	3 0	..	29	1915-18 only.
L	2 3	1 7	27	16	1914-18 only.
M	9 6	7 2	59	45*	1914-18 only.
N	7 6	8 3	56	60	
O	4 1	3 2	63	47	
Highest (1913-18) ..	7 10	8 3	64	60	
Lowest (1913-18) ..	-2 3‡	2 8	-20‡	21	
Mean (1913-18) ..	5 10	5 9	41.5	47	

* Producing at a loss. † State mines. ‡ Decrease.

Table 75A summarizes the position for the coal-mining industry as a whole in regard to average selling-prices, cost of production, and profit per ton for the period 1913-18 in so far as it is represented by the data in evidence.

TABLE 75A.—AVERAGE COSTS, SELLING-PRICES, AND PROFITS PER TON FOR THE INDUSTRY AS A WHOLE, 1913-18.

	Coal from Mines giving Exact Data for each Year of the Period 1913-18.				All Coal to which Data related, 1913-18, whether from Mines over the Whole or Part of Period.			
	1913.	1918.	Increase 1913-18.	Increase per Cent. 1913-18.	1913.	1918.	Increase 1913-18.	Increase per Cent. 1913-18.
	s. d.	s. d.	s. d.		s. d.	s. d.	s. d.	
Average selling-price ..	14 3	19 5	5 2	36	14 3	17 5	3 2	22
Average cost of production ..	13 6	18 7	5 1	37	13 6	17 0	3 6	26
Average profit ..	0 9	0 10	0 1	11	0 9	0 5	0 4	44
							(decrease)	(decrease)
Rate of profit per cent. of cost of production	0 5½	0 4½	..	..	0 5½	0 2½	..	..

This summary shows clearly that the mining companies have not increased their gains from the industry during the war period relatively to their costs.

The factors determining the changes in the average cost of production have been considered in Chapter II. For the causes of the increased selling-price see Chapter I, section 7 (vi), p. 23.

(ii.) THE CONTENTS OF PROFIT.

The assessment of either the true *amount* or the true *rate* of profit is not an easy matter. The rates of dividend paid to shareholders provide a rough but not exact measure if averaged over a long period. Quotations of rates for short periods only may seriously mislead, especially if the industrial enterprise in question extends, or is expected to extend, over many years. Rate of profit is the ratio of gain to capital, and not all gains are distributed to shareholders in the form of dividends, nor should the amount of capital given as the “paid-up capital” be accepted without close examination as the base on which to calculate the rate of gain.

The fund from which profits come is the excess of the sum obtained from sales over the corresponding expenses. A preliminary question, therefore, in considering whether profits are “fair and reasonable” (Order of Reference, clause 3), is whether all the essential elements of cost and income have been included in the calculations of costs and selling-prices submitted to the Board.

(a.) In one or two cases the coal business is not the only business conducted by the company in question; but it has been possible to separate the coal-mining costs and income distinctly from the other costs and income. It is only when we come to distribution that this difficulty becomes serious.

(b.) The income has been correctly ascertained, net figures being required and obtained in every case. The selling-prices have also been determined in competitive conditions, and cannot be regarded as monopoly revenue.

(c.) But, as regards costs, examination shows that the owners’ analyses, taking the coal-mining industry as a whole in New Zealand, do not make sufficient provision for certain expenses that should be regarded as inseparable from the industry. If they are not allowed for, the industry cannot hope to hold its own in the long-run with other industries of the Dominion in competition for the capital necessary for its maintenance and extension. In particular, sufficient has not been allowed for depreciation on plant and buildings, and it is unquestionable that in many cases little has been done towards providing the sinking funds which are necessary in view of the fact that a coal-mine is a

wasting asset, or the reserves as a necessary means of insurance against the risks in mining, such as floods, fire, faulting, thinning-out of seams, changes of quality, and so forth. Some of the large mines have made no allowance for depreciation in calculating profits, nor have they built up reserve funds. For example, to take three large collieries, one mine made no depreciation allowance till 1918, and has no reserve fund; another put aside only £2,500 each in 1914 and 1915, having made no provision for depreciation in other years; the third has not treated depreciation as an annual working charge, but has appropriated something as it was possible from the balance available from time to time, setting aside about 1½ per cent. in this way during the period under review.

Where there is freedom of sale and purchase in a market there tends to be one sale price for coal of a particular grade and quality, allowing, of course, for the expenses of transport from one point to another within the market area. If two mines supply the same class of coal to the same market their selling-prices for that coal cannot differ in the long-run to any appreciable extent, but the cost of production of the two mines may differ owing to differences in advantages for production; and, since the supply from both is necessary to satisfy the needs of the market, one mine obtains a greater gain per ton than the other. Such differences in the amount of profit per unit of output is a necessary result of circumstances that cannot be altogether removed, but they are minimized by every factor making for freedom of competition, and tend to become greater the less freedom allowed producers and purchasers.

If all costs and selling-prices are correctly calculated, the difference would in every case give the amount of pure profit, if such in reality exists.

"Profits," however, is a term of loose and varied usage, and is often used to include some of the costs as noted above. Such "gross profits" may have to provide funds for charges not already allowed for. Commonly the following are such:—

- (a.) Insurance charges. We have already noted that, though the mining companies have included certain insurances in their cost figures, they have not included all that might fairly be charged against the risks of coal-mining.
- (b.) Depreciation and sinking-fund charges, to allow for wear-and-tear and replacement of capital and wasting assets. The mining-costs quoted make quite insufficient provision for such charges.
- (c.) Wages of superintendence of the owner of the capital. In the case of mining companies, whose businesses are joint-stock and conducted by salaried managers, this item is negligible, being confined merely to the trivial sum that may be regarded as a shareholder's remuneration for the trouble of making the particular investment and exercising that very general control over the business which is the particular function of shareholders in a joint-stock company. Directors' fees have been included in every case in ordinary costs, as well as the ordinary salaries of shareholders who may also happen to be officials.
- (d.) Interest on the capital invested. No interest has been allowed for in the mining-costs recorded and presented to us beyond interest payable to those who had lent money to the companies by overdraft, debentures, &c. The chief charge on the profits fund of the companies is interest on the actual amount of the shareholders' investments.
- (e.) Pure or net profit, which, wherever it exists, is largely a differential return—that is, a return due to the company's possession of some peculiar advantage in production or situation over its competitors producing for the same market.

In estimating the actual net profit per ton it is therefore necessary to deduct from the figures of mine-profit quoted in Table 73 a certain amount for insurance, depreciation, sinking fund, and interest charges. *In the majority of cases there is insufficient margin to provide for these*; not only is there no net profit, but there is a loss. In the case of a large company the margin, averaging over 1913–18 about 1s. 2d. per ton, was insufficient to provide depreciation and interest on capital by 1s. 11·38d., 4·71d., and 8·04d. for the years 1913–15; and by 1·875d. and 10·584d. for the years 1917–18. Similar calculations could be made for other mines.

(iii.) THE MEASUREMENT OF RATE OF PROFIT.

The rates of dividends to shareholders declared by the principal colliery companies since 1913 are set out in the following table:—

TABLE 76.—RATES OF DIVIDEND DECLARED BY CHIEF COAL-MINING COMPANIES IN NEW ZEALAND, 1913–18.

Mine.	1913.	1914.	1915.	1916.	1917.	1918.	Annual Average for Company.
A	0	0	0	0	0	0	0
B	5	10	0	0	0	0	3
C	0	0	0	5	5	0	1·7
D	10*	10	10	8·75	8·75*	8·75*	9·38
E	10	5	0	0	0	10	4·17
F	5	5	10	10	5	..	7
G	..	7·5	0	0	0	7·5	3
H	0	0	0	10	20	10	6·7
I (8 years old, 31st January, 1918)	0	0	6	6	7	6	4·17
J	0	0	0	0	0	0	0
K	0	0	0	0	0	0	0
L	10	10	10	10	10	10	10
Average dividend unweighted ..	4	3·95	3	4·15	4·65	5·23	..
Average dividend weighted according to size of capital	4·6	5	4·3	4·4	5·3	5·1	..

* Plus a bonus = 2½ per cent.

Weighted average for whole period = 4·8 per cent.

Of the twelve principal coal companies the highest average annual dividend for the last six years is 10 per cent. (and that was returned to a company which for seventeen years—viz., 1880–97—paid no dividend at all) and the lowest zero. Of the twelve companies, two paid an average dividend of from $7\frac{1}{2}$ to 10 per cent.; two paid an average dividend of from 5 to $7\frac{1}{2}$ per cent.; four paid an average dividend of from $2\frac{1}{2}$ to 5 per cent.; one paid below $2\frac{1}{2}$ per cent.; three paid no dividend at all.

The weighted figures giving the ratio of all dividends paid to the sum of all the capitals involved are the most significant, and provide the best measure that the declared dividend rate can give of the profits made by the coal industry viewed as a whole and not in relation to any one company or group of companies. It is the dividend return which would be registered if all the capital in question were the property of one shareholder. *This weighted dividend ranged during the last six years for the principal collieries of the Dominion from 4·3 to 5·3 per cent., the rate for the whole period being 4·8.* The income actually derived by shareholders in general from the money invested by them in coal-mines may be said to have returned them directly from about $4\frac{1}{2}$ to 5 per cent., if we allow for capital excluded from the inquiry—a rate that can be regarded only as extremely moderate in view of the ruling rates for pure interest alone during this period. It will be noticed how the very large capital of Company D, with its uniform and fairly high rate of return, influences the figure of the weighted average.

But, as stated previously in this chapter, it is necessary to go behind declared dividends on the capital in order to get an approximately just measure of profits. The gain to a company is the whole of its profits for the period, the excess of income over expenditure as shown in its profit and loss account in the balance-sheets; the rate of this gain is the ratio of the total gain to the total capital that has actually been paid in by shareholders. This latter sum, the capital with which shareholders had actually parted, may or may not be the same as the amount of “paid-up” capital, since subscription may or may not have been at par, and companies may issue their shares at a premium or give bonus stock.

The gain to the shareholder is not necessarily identical with the gain to the company, since the whole of a year's profit as set out in the annual balance-sheet is not distributed in dividends to shareholders, but only a certain part after providing for reserves and similar funds. Neither is the whole of the shareholder's profit identical with his dividend; every receipt and every expenditure of the shareholder arising out of his investment must be taken into account. In addition to dividends on the receipt side are such gains as come from the issue of new shares at preferential rates to existing shareholders, and, less clearly, any rise or fall in the market value of his shares. On the other side there are all losses of capital, whether complete or whenever the nominal value of capital is reduced. The ratio of the net gain thus calculated to the capital actually paid in will be the real rate of profit to the shareholder.

Table 77 gives an estimate of the rate of profits gained by the mining companies in New Zealand during the period 1913–18 in so far as it has been possible to calculate it from the data available to us. The companies' balance-sheets show the “authorized” capital and the “paid-up” capital in each case, but they do not state the actual “paid-in” capital, the calculation of which would involve a searching detailed inquiry into the whole financial history of each company. In some cases the amount actually paid in as working capital available to the companies would be greater than the present paid-up capital as shown in the balance-sheets, and in other cases less. It is not possible from the scanty data yet available to give any reasonable estimate of the change in the rate of profit by calculating it on “paid-in” rather than “paid-up” capital.

TABLE 77.—PROFITS OF MINING COMPANIES, 1913–18.

Company.	Average Annual Sum of Capital during Period.		Average Annual Total Profits.	Rates of Profit.	
	Nominal Paid-up, to nearest Pound.	Actual Paid-In.	Excess of Profits over Losses in Balances.	Nominal. Ratio of Column 3 to Column 1 (per Cent.).	Actual. Ratio of Column 3 to Column 2 (per Cent.).
	(1)	(2)	(3)		
A (six years)	£ 41,886	£	£ s. d. 1,818 9 0	4·34	
B ”	76,819		5,027 15 2	6·54	
C ”	177,851		10,990 2 1	6·18	
D ”	441,667		42,835 13 6	9·7	
E (five years)	128,028		3,987 9 1	3·11	
F ”	..	..	..	..	..
G ”	11,255		916 12 2*	8·14*	
H (four years, 1914–17) ..	192,694		2,075 0 10	1·08	
I (three years, 1916–18) ..	50,000		7,514 19 9	15·03	
J† ”	65,435 (debentures)		452 16 10	0·69	
K	28,330		5,201 19 6*	18·36*	
Total	1,290,784		65,583 14 7	5·1	

* Loss.

† In liquidation.

The average annual returns of the companies over the period 1913–18 therefore range downwards from 15·03 per cent. on their paid-up capital to a loss of 18·36 per cent. This includes all profits, including those not distributed to the shareholders. *The average, weighted according to the capital*

in each company, is a rate of just over 5 per cent., out of which the industry has to make provision for return to the shareholders by way of interest and a large part of the insurance against the risks associated with the industry, as well as providing a considerable part of the depreciation and sinking-fund charges. It is clear that, judged by the current rates in finance during the period, this return does not constitute a fund sufficient for these purposes.

Passing from dividends and companies' gains to the question of the actual net gain of shareholders we were confronted by difficulties too great to be overcome in the time at our disposal in attempting an exact estimate of these over the period. The subject, however, is so important that we offer a few remarks by way of definition of this particular return, and suggest the form in which the results of such an inquiry may be summarized. This latter is done by the heads of the blank Table 78 which follows.

TABLE 78.—TO SUMMARIZE SHAREHOLDERS' NET GAINS.

Company.	Total Capital.		Shareholders' Receipts.		Shareholders' Losses.				Shareholders' Profit.	Rates of Profit.		
	Nominal Paid-up.	Actual Paid-in.	Dividends.	Gain on Shares below Market Value.	Total.	Loss on Paid-up Capital.	Loss on Premiums on Shares.	Reduction of Capital.	Total.	Excess of (5) over (9).	Nominal Ratio per Cent. of Columns (10) to (1).	Actual Ratio per Cent. of Columns (10) to (2).
	(1.)	(2.)	(3.)	(4.)	(5.)	(6.)	(7.)	(8.)	(9.)	(10.)	(11.)	(12.)
Totals ..												

The average rate obtained means the percentage of gain that would have fallen to all the shareholders if they had subscribed to the shares at par (in the first case) or at the actual price received by the companies, and had either kept their shares ever since or had sold them for the price they had given. It is the gain that would have been reaped if all the capital invested had remained the property of a single shareholder. As a matter of fact, however, shares change hands at varying prices above and below their original price, and to the individual holder the annual profit is the percentage yield to him at the price he gave. But it is impossible to determine the figure showing general percentage of yield over all the period unless the price at which every share was sold during the period is known, and this knowledge is not available. Nor does it seem necessary for the particular purpose to take account of the rise and the fall in the market value of the shares, for the reason that the price which is paid for shares to a previous holder of them does not form any part of the working capital of the business; the only price that provides capital for the company is the original price paid. The rate quoted, therefore, may be accepted as the truest possible expression of the profits of investors in mining companies over the period. It represents, as Sir William Ashley says, writing of a similar figure for German engineering businesses, "the surplus share of the product which went to those who contributed capital, who undertook the limited risk involved in the investment and exercised the amount of control which falls to the ordinary shareholder—the share, that is to say, remaining after all the working-expenses had been met, including the remuneration both of directors and managers, and the interest on borrowed money. The surplus went to somebody; and, if it did not go to shareholders who entered later and bought these shares at an advanced price from previous holders, it went to those who had sold out at the capitalized value of the expected dividends."

In estimating the return to the capital invested in coal-mining as a whole, as distinct from the return to the owners of capital invested in particular mines, it is necessary to take account of the capital lost in the mines that have been closed down as failures. A large amount of capital was shown in evidence to have been lost in this way in New Zealand, but before the period under review. The fact of such losses, however, is relevant to this inquiry, in so far as it should affect the estimate of the amount necessary to insure against the risks of coal-mining in the Dominion.

2. PROFITS IN DISTRIBUTION.

(i.) TRANSPORT.

The first phase of the distributive process considered was transportation. Transportation is undertaken by the Government railways and by shipping companies.

It is impossible to ascertain the profits made by the railways from the carriage of coal on all lines in New Zealand, since separate records of the cost of handling the different classes of traffic cannot be kept. On the lines connecting large collieries with the coal-ports the traffic in coal naturally returns a high profit. Representatives of the coal companies generally express themselves as satisfied with the facilities provided by the railways for the carriage of their coal and the working of the mines, but express no opinion as to the reasonableness or unreasonableness of the rail-age charges, which are paid in most cases by the dealers, who, of course, pass them on to consumers.

The Union Steamship Company provides the bulk of the shipping for the sea carriage of coal. During the period under review it has had twenty-nine ships more or less regularly used as coal-carriers in the West Coast and Australian coal trade. All of these ships, however, perform other work than the transport of coal, and this mixed service has made it particularly difficult to analyse the cost of carrying coal alone. Many of the ships carried coal and general cargo at different times of the year. In many cases, too, where the cargo one way is coal, the back cargo is general merchandise. By taking, however, the average expenses apart from labour, and adding to them the labour on the coal, the company provided us with data which may be regarded as a fair sample of the trading particulars relative to boats, giving a spread of tonnage from a small collier up to the largest regularly employed on the New Zealand coast. Calculations from this data show the company to have earned by such ships in the New Zealand trade up to the end of 1917 the following profits per ton of coal carried :—

TABLE 79.					Tons carried.	Net Profit per Ton.*
Year ending						s. d.
September, 1914	..	..	..	..	218,726	1 3
„ 1915	..	..	..	..	390,332	1 3
„ 1916	..	..	..	..	458,512	1 0½
„ 1917	..	..	..	..	503,496	1 0

* Out of this depreciation, sinking fund, and periodical overhaul charges are to be provided.

The average yearly cost per ton of running these ships increased in this period by 48·35 per cent., while the average freight return increased 34·79 per cent. No allowance has been made in the cost for depreciation and periodical overhauls. The data for 1918 have not yet been calculated, but the company states that the margin between cost and return shows a slight improvement. It has to be remembered, however, that an unusually large amount of overhaul and general repair work has to be done owing to the postponement of repairs since the outbreak of the war.

The position in regard to the Newcastle trade is still more difficult to analyse. The company estimated in September, 1918, that it was importing at the rate of about 190,000 tons a year. Changes from coal-carrying to general carrying are more frequent in the Newcastle trade than in the coastal trade. The difference between the cost and the freight rate is greater, but the voyage is longer, and the ships have often had to run back in ballast. The trade on this run, too, has been worked in close collaboration with the Ministry of Munitions and Supplies.

The freight rates charged by the Union Steamship Company are 35 per cent. lower than those asked by the Australian Controller of Shipping. The Australian Controller on occasion provided shipping for the coal trade to New Zealand, but at a rate over 50 per cent. higher than the Union Company's rates (£1 5s. as against 16s. 3d.). The Union Company's rates are over 56 per cent. lower than those of the Imperial Controller, the latter charging £1 10s. as his lowest rate against the Union Company's 16s. 3d. The rates of the Union Company are also less than those of any Australian shipping company which has been operating outside the Controller.

The company claims that it has fully considered and rendered its obligations to New Zealand ; that, with the exception of one ship leased to the Navy, it has parted with none of its tonnage on time charter, though very high rates have been offered to it. *The increase in the freight rates may be regarded as moderate when viewed in the light of the increased cost of rendering the service and of the tremendous increase in the world demand for tonnage, the great shortage of shipping, and the enormous revenue that could have been obtained by using the ships beyond the New Zealand trade.*

One coal company which carries part of its coal-output in its own vessels, and which credits them with the ruling rates of freight, testifies that these ships “barely pay working-expenses.” But the Board obtained particulars from another company with shipping engaged exclusively in the carriage of coal from the West Coast, and these show that the current rates of freight on coal afford a very substantial margin of profit in special cases, even when the ships carry no back cargo.

Profits in the wholesale and retail trade in coal have already been considered in Chapter III, section 2, subsections (ii) (g), (iii) (d), (iv) (g), (v) (d), and (vi) (d), pp. 42, 45, 50, 52, and 55. The general conclusion is that, except in the case of those dealers who are engaged in the retail trade on a large scale, the difference between the cost of coal to the dealers and the price received by them affords but a mere living to those engaged in it. The profits of the retail dealers cannot be assessed as exactly as those of the mining companies because of the mixed nature of the business conducted by them, but the balance of evidence does not suggest that they are not “fair and reasonable” as the industry is organized at the present time.

CHAPTER V.

THE EARNINGS OF MINE WORKERS.

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1. RATES OF PAY AND ACTUAL EARNINGS.

IN assessing the increases in earnings since the commencement of the war we must distinguish between *rates of pay* per unit of time or per unit of output and the *earnings actually received* by the worker. A 20-per-cent. increase in the rate of pay per ton mined does not necessarily mean 20 per cent. increase in the actual earnings of the miner, since the increase in the rate may be accompanied by some change, not proportionate to the change in rate, in the duration or constancy of the employment, the efficiency of the miner's work, or some other factor or condition influencing the total amount of his output in a given period.

The increases made during the war in the rates of pay for workers engaged in the production of coal are set out in the industrial agreements made during this period, though in some cases higher rates may be actually paid and more concessions granted, by way of "yardage" in narrow or steep places, &c., and other allowances, which enable a higher real rate of pay to be earned.

The rates for hewing in 1914 were: Buller—Pillars, 1s. 11d.; solid, 2s. 4d. per ton. Grey—Pillars, 2s. 2d.; solid, 2s. 4d. per ton. North—Pillars, 2s.; solid, 2s. per ton. South—Pillars, 2s. 3d.; solid, 2s. 5d. per ton. There were some variations—*e.g.*, in a northern mine 1s. 8d. was the rate in 1914, rising to 1s. 10d. in 1916 and 2s. in 1917. In another north mine the rate was increased by 2d.

These rates have remained as the minimum or standard; but in the first half of 1916 an increase of 10 per cent. was granted as a war bonus. The date on which the payment of this first war bonus began varied from mine to mine. The second war bonus of $7\frac{1}{2}$ per cent. was paid from about the middle of 1917, and the third, also of $7\frac{1}{2}$ per cent., from September–October, 1918. *There has therefore been an increase in the rates paid to miners of at least $17\frac{1}{2}$ per cent. between the outbreak of the war and September–October, 1918, and 25 per cent. after the latter date. The increases granted at the same times to all other workers, those on day-wages at the mine, whether underground or on the surface, were 10 per cent. in each case, making a total increase of at least 30 per cent. in their rates of pay.*

2. PRECAUTIONS NECESSARY IN COMPARISON OF EARNINGS.

In making comparisons between the actual earnings of miners at two different periods and endeavouring to find the causes of the changes noted *attention must be given not only to any change in the rate of pay per ton, but also to alterations in the following factors, among others, influencing the general result* :—

- (1.) The length of the average daily shift. This has not varied in the period under review.
- (2.) The average number of shifts worked per week. This may vary from year to year.
- (3.) The percentages of the total number of miners employed which are made up of the numbers of miners who are paid at the several rates from the lowest to the highest. All miners in a mine are not employed at the same rate of pay. At one date 80 per cent. of the total may be engaged at the highest rate paid in the mine, at another date only 70 per cent.; this will affect the average earnings even if all other things are unchanged. *The rates vary according as the miner is working*—(i) on low coal; (ii) on hard coal; (iii) in narrow places; (iv) in wet places; (v) on steep inclines; (vi) on pillar coal; (vii) on stone bands; (viii) on distant faces; (ix) with or without a mate (without usually in low places). It is true that the rates are differentiated with the object of roughly equalizing earnings, but they do not always actually have that effect. If at one date a larger percentage of men are employed at the higher rates than at the other date in the comparison, this fact alone would help to explain higher average actual earnings, quite apart from any increase in the rate of pay. In these circumstances there might even be an increase in actual average earnings with a decrease in rates of pay. (Example. —At first date: 20 at 3s. and 80 at 2s. 6d.; average, 2s. 7·2d. At second date: 90 at 2s. 9d. and 10 at 2s. 3d.; average, 2s. 8·4d.)

- (4.) The intensity of the miner's labour. He may work harder in a given time and so increase his earnings, though paid the same rate, and conversely. In one of the largest mines it was said the

men had been working a little harder than they did prior to the war. Mention of the fourteen weeks' "go-slow" policy early in 1917 is relevant here.

(5.) The efficiency of the labour. This may be affected by differences in the training or skill of the miner, or by changes in the mechanical aids to production used by him, or in the general organization of the mine. There appears to have been no noteworthy changes in this respect in New Zealand during the past five years, except that in some cases the explosives used to fall the coal are inferior in quality to what they were before the war. Nor can it be said that the class of miner employed has on the average changed much as regards skill and energy.

(6.) Certain conditions influencing the amount of the miner's output in a given time. Most of these have been noted under (3) above.

It will be seen from this brief consideration of the subject that the relation of miners' actual earnings to his rate of pay per ton hewed is not a simple matter, but most complicated, and that statistics of average earnings and output per man per shift over a period such as those in Table 80,

TABLE 80.

Mine.	Per Cent. Increase in Rate of Pay.	Per Cent. Increase in Actual Earnings per Shift.	Per Cent. Increase in Actual Weekly Earnings.	Increase or Decrease in Shifts worked per Week per Miner.	Increase or Decrease in Output per Shift.	Remarks.
A	16½	28½	36¼	+⅛*	Cwt. Same	..
B	16½	35½	37	Same	+23 cwt.*	Much higher proportion of high coal.
C	16½	33	15	-⅟10†	+17*	Shorter travelling-distance; higher coal; slightly larger proportion of pillar work.
D	16½	28	12	-½†	-15†	Less pillar and more solid workings.
E	16½	33	40	-¼†	..	..
F	..	16½	3½	-⅓†	+33·8*	For period 1915-18 only.
G	17½	37	48½	+⅓*	+22·7*	Much pillar extraction; less travelling.
H	16½	..	..	..	+7*	..
I	16½	22	16	-⅓†	..	Hewing rate increased by 2d. more than 17½ per cent.; travelling-distance increased; more headings, for which better returns.
J	..	..	..	..	-4·2†	..
K	16½	22¼	32	+⅔*	-7†	Larger proportion of men on development work; larger number of yardage places; inferior explosives.

* Increase. † Decrease.

which refer mainly to the years ending the 30th April, 1914, and the 30th April, 1918, cannot be understood and interpreted by any one who has not made himself familiar with the changes in all the factors noted above (and others, for the list is not exhaustive) in the mine to which they relate. It is quite impossible to make any reasonable comparison of earnings at one mine with those at another at a given period, or of the earnings at the same mine at different periods without an intimate knowledge of all those conditions. It cannot be argued, for example, without reference to possible changes in one or more of a dozen factors, that since the miner's actual daily earnings have increased more (or less) than his standard rate of pay that he has therefore been working more (or less) intensely or increasing (or decreasing) his output per day.

The relation of output per miner per shift to actual earnings is similarly complicated. It is possible, for example, for the miner's output to fall, whilst his actual earnings are rising quite apart from any increase in the standard rate of pay. This may be due to his working during the latter period at a place where more "yardage" is paid (low coal or narrow or steep places), or working on development operations, or in wet places, or in places necessitating much picking-out of stone, for which considerable allowance is made. One or two examples may be cited. If a miner works first at a 10 ft. place at 2s. 4d. and then at a 4 ft. place at 3s. 6d. to 4s., the earnings of the low place will in all probability be higher than those of the high place, although the output per shift is lower in the former case. Two pairs of miners working eleven shifts per man for the same fortnight in the same mine (March, 1918) may be compared :—

		Wages.			Bonus.			Total.		
		£	s.	d.	£	s.	d.	£	s.	d.
A and B fill 689 skips at 9d.	..	..	25	13	9	4	9	30	3	7
C and D fill 488 skips at 9d.	..	..	18	6	0	..	..	..	..	..
C and D cut 37 ft. at 2s.	..	..	3	14	0	..	..	..	..	..
C and D cut 43 ft. at 1s. 8d.	..	..	3	11	8	..	..	..	..	..
C and D trucking	..	..	3	9	9	..	..	..	..	..
C and D 4 sets timber	..	..	0	10	0	..	..	..	..	..
						5	3	34	14	5

C and D earn £4 10s. 10d. more than A and B although their output is over 6 tons less in the fortnight.

The figures of output per miner per shift even when viewed alone, apart from earnings, therefore require to be read with other data before being used as the bases of argument. The following table, for example, has little real meaning until it is stated that during the first year a large percentage of the work done was from "headings" where working-conditions are more favourable, that during part of the second year the "go-slow" policy was in operation, and that during the third there was a more frequent use of explosives, tending not only to increase the *per capita* output, but also to render the quality of the coal inferior because of the larger percentage of slack.

Year.	Tonnage per Man per Shift.
1915-16	6.71
1916-17	5.96
1917-18	6.71

Other important facts to be taken into account in comparisons of *real*, as distinguished from *money*, earnings are described in section (iv) below.

3. MOVEMENT IN ACTUAL EARNINGS DURING THE PERIOD.

Taking *eight large mines* typical of the different fields we find, comparing the year ending the 30th April, 1914, with the year ending the 30th April, 1918 (the year ending the 31st March, 1914, with the six months ending the 30th September, 1918, in the case of the last quoted), that the *average daily actual earnings of miners had increased by the following percentages respectively: 22, 22½, 28, 28½, 33, 33, 35½, and 37, showing that the increase in actual money earned per shift was much greater than the increase in the rates governed by the industrial agreements of 1916 and 1917.* This shows that whilst the miner was working at the coal-face he worked with greater intensity, or efficiency, or in some such different conditions as described in section (ii) immediately above, than before 1914. It is to be noted that the full effect of the 1917 increase in pay had not been exerted upon the average in seven of the cases, as a full year at the higher rates had not been worked by the 30th April, 1918, or, in other words, as about two months at lower rates is included in the last annual average. *The amount actually received per miner per week at the same mines in the order given increased for the same period by the following percentages respectively: 16, 32, 12, 36½, 15, 40, 37, and 48½.* In three cases the percentage increase in the amount received per week is below the percentage increase in the rates, these three cases being from three different fields. Since these miners increased their daily averages by more than the percentage increase in rates, it would appear that they worked considerably less time over the year in the latter period. In the other cases it was not only much above that percentage, but also above the actual increases in the daily wage. Taking these mines as a whole and giving due weight to the number of men employed it cannot be said that the coal-miners "have not generally taken advantage of the opportunity to increase their earnings in proportion to the rates paid," though it is true of the mine which the witness quoted had particularly in view.

The truckers' daily wage actually received increased 15½ (20), 17 (25), 18½ (14½), 20, 20, and 23 (33) per cent. per shift in the same period. Their wage per week in the majority of cases increased in greater proportion, the figures (those stated in parentheses) rising up to as high as 33 per cent. In the case of contract truckers at a large mine the daily rate of increase was 32½ per cent. and the weekly rate 50 per cent. Underground shift-men increased their daily wages 20½, 20½, 17½, 18½, 19, and 23 per cent., and in the case of the last four mines their weekly wages by 29½, 15½, 20½, and 30½. The weekly wages increased at a greater rate than the daily and at a greater rate than the rates of pay. Surface shift-men increased their daily wages 20, 20, 18½, 20, 18½, and 22 per cent., and in the case of the last four mines their weekly wages 44, 18½, 27, and 23½ per cent. The same remarks apply to surface shift-men as to underground shift-men.

Miners' actual earnings per shift at these mines therefore increased about 30 per cent., taking an unweighted average and comparing the year ending April, 1914, with the year ending April, 1918, though their rates increased only about 16½ per cent. The average for the increase in actual weekly earnings is a very little more. Over the same period truckers' rates increased between 18 and 19 per cent., their actual earnings per day by about the same, and their actual weekly earnings by about 4 per cent. more. Shift-men increased their daily actual earnings by nearly 20 per cent. and their weekly by 25 per cent.

The increases in miners' actual earnings have a very close connection with the increases in the rates of pay provided for by the industrial agreements of 1916 and 1917. In every case quoted the institution of the new rates of pay was followed by more than proportionate rises in the actual earnings. The case of the miners employed at two mines may be taken as typical. The first addition of 10 per cent. to the rates of pay was made in March, 1916, and the second of 7½ per cent. in June, 1917. When the actual earnings per shift per miner for the whole of the six months immediately preceding and the six months immediately following the changes are compared it is found that there is a considerable increase.

The labour-cost per ton for mines giving returns for each year of the period 1913-18 increased 31 per cent., and that for all mines providing data for any year 20 per cent. If all the coal mined from 1913 to 1918 could be taken into account the increase in labour-cost would probably be found to be at least 25 per cent. The mine workers in general therefore received about a quarter more per ton. The statistics of the Mines Department show that the output per underground worker increased by about one-fifth from 1913 to 1918; the actual increase in the average mine worker's earnings would therefore appear to be considerably more than this percentage. When the total wages actually paid

each year to all employees at each of seven large mines in the north, west, and south are divided by the total number of employees it is found that the wages per head, or ratio of wages to workers, increased from 1913 to 1918 by 34, 36, 37, 50, 51, and 55 per cent. The value of these two latter comparisons as to output and wages is discounted, however, by the unsatisfactory nature of the method of recording the total number of employees. The result has probably been influenced in the direction of overestimating the increase by the fact that mine labour was much less migratory in 1918 than it was in 1913.

TABLE 81.—AVERAGE DAILY EARNINGS PER MINER AT MINES X AND Y PRIOR AND SUBSEQUENT TO INDUSTRIAL AGREEMENTS OF MARCH, 1916, AND JUNE, 1917.

	s.	d.	Increase.
Average earnings for six months before March, 1916..	18	9	
Average earnings for six months after March, 1916 ..	22	0	17½ per cent.
Average earnings for six months before June, 1917 ..	18	3	
Average earnings for six months after June, 1917 ..	25	0	37 per cent.

The comparatively low average for the six months before June, 1917, is due mainly to the “go-slow” policy in vogue for a considerable part of that period. It will be seen that the 10-per-cent. increase in rates in 1916 was followed by a 17½-per-cent. rise in the actual earnings per day. But for the “go-slow” policy and kindred factors the average of 22s. would probably have been maintained in the early part of 1917, so that the increased rates of June, 1917, would have been followed by a rise of over 13 per cent. or nearly double the increase of 7½ per cent. in the rates of pay. The average actual earnings for the six months following the second agreement were 33½ per cent. higher than the corresponding earnings for the six months immediately preceding the first agreement, although the two agreements together provided only for a rise of 17½ per cent. in the rates.

4. EXAMPLES OF ACTUAL EARNINGS AND OF INCREASES IN ACTUAL EARNINGS.

(a.) The actual earnings per man per shift at Mine X* from April to June, 1918, five periods, of the ten highest workers averaged 22s. 8d., the highest being 39s. 4d. and the lowest 19s. 4d.

(b.) Mine A :—	Average Daily Actual Earnings.		Average Weekly.		
	s.	d.	£	s.	d.
1913-14	14	3†	3	7	7½
1917-18	17	4½†	3	18	3½
First three months, 1918	18	7	3	14	3½
April-August, 1918 (five months)	19	2§	4	6	3||

(c.) General net averages at Mine A1 for fortnight ending 21st June, 1918, 20s. 5d. ; at Mine A2, 17s. 11d. for hand and 23s. 8d. for machines. The daily wages increased at a much higher rate than the weekly wages.

(d.) Mine B, year ending 26th April, 1918 :—

	Daily.		Weekly.			
	s.	d.	£	s.	d.	
Miners earned ..	18	4.1	3	17	8	(Could have earned £4 12s. 5d. by working full mine time.)
Truckers earned ..	18	3.8	4	11	8	(Could have earned £4 12s. 3d. by working full mine time.)

Truckers earned per shift for the four periods preceding our visit an average of 22s. 0½d. ; 21s. 9½d. ; 21s. 5d. ; and 21s. 4½d. ; (highest individual, 27s. 8½d. ; lowest, 14s. 10d.).

The miners’ general average for the year 1916 was 16s. 10½d. ; for 1917, 16s. 3.3d. (“go-slow” three months) ; and for 1918 to August, 19s. 0½d.—an increase of 12¾ per cent. in three years.

(e.) Mine C (average weekly earnings) :—	Miners.			Truckers.		
	£	s.	d.	£	s.	d.
Year to 31st August, 1914	3	7	11	3	9	9
„ 1918	4	17	9	4	4	0
Increase per cent.	30½			17		

(f.) Mines D1 and D2 :—
Miners :—

Year ending	Mine D1.			Mine D2.		
	Daily.	Weekly.	Possible.	Daily.	Weekly.	Possible.
	s.	d.	s.	d.	s.	d.
30th April, 1914	16	5½	71	1½	14	10
„ 1918	21	1½	96	11	89	3
Increase per cent.	28½	36½	..	35½	37	..

* See note on p. 2. † Nearly 22 per cent. increase. ‡ 16 per cent. increase. § 34 per cent. increase.
|| 28½ per cent. increase.

						Mine D1. Daily. s. d.	Mine D2. Daily. s. d.
Truckers :—							
1914	..	..	..	..	..	10 9	10 6
1918	..	..	..	..	..	12 11	12 7
Increase per cent.	..	..	..	..	..	20	20
Shift-men (underground) :—						s. d.	s. d.
1914	..	..	..	..	..	11 0	11 0
1918	..	..	..	..	..	13 3	13 3
Increase per cent.	..	..	..	..	..	20½	20½
Shift-men (surface) :—						s. d.	s. d.
1914	..	..	..	..	..	10 0	10 0
1918	..	..	..	..	..	12 0	12 0
Increase per cent.	..	..	..	..	..	20	20

The highest-waged miners at Mine D1 increased their daily and weekly earnings by 28½ per cent. and 36¼ per cent. respectively, and the lower-waged men by a higher percentage—viz., 35½ and 37 per cent. The weekly wage has increased at a higher rate than the daily, especially at Mine D1, showing there must have been a better average of attendance. It was possible for the miner at Mine D1 to increase his actual earnings by nearly 53 per cent. and at Mine D2 by nearly 65 per cent. on the assumption that he worked full mine time, an assumption, however, that has little support in mining practice. Whether the miners could have considerably increased their annual working-time without injury to themselves is another matter. Truckers and underground shift-men increased their earnings by 20 per cent. (Another increase of 10 per cent. in their rates has been made since April, 1918.)

(g.) Mine E :—

Year ending				Miners.		Contract Truckers.		Surface Shift-men.	
				Shift.	Week.	Shift.	Week.	Shift.	Week.
				s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
30th April, 1914	..	..	..	17 2.40	77 4.8	14 0.30	65 10.3	10 6	51 11.7
„ 1917-18	..	..	..	22 10.04	89 0	18 6.20	98 0	12 5.6	74 9½
Increase per cent.				33	15	32½	50	18½ (youths)	44

Year ending				Underground Shift-men.		Wage Truckers.	
				Shift.	Week.	Shift.	Week.
				s. d.	s. d.	s. d.	s. d.
30th April, 1914	..	..	..	11 1.21	54 3.4	11 4.04	56 4.11
„ 1917-18	..	..	..	13 0.5	70 5	13 1.42	67 6
Increase per cent.				17½	29½	15½	Nearly 20

The contract men's earnings increased most, especially the weekly wage, which increased more than the daily. They get the highest weekly wage, but not the highest daily wage. All weekly wages increased more than daily, except the miners' wages, but those of the surfacemen more than those of the underground men, showing that the overground men put in more time at work.

(h.) Mine F :—

Year ending				Miners.		Contract Truckers.		Wage Truckers.	
				Shift.	Week.	Shift.	Week.	Shift.	Week.
				s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
30th April, 1914	..	..	..	17 11.94	90 0	..	..	10 6	54 7
„ 1917-18	..	..	..	26 6.4	126 2	15 1.7	74 9	12 5	62 5
Increase per cent.				Nearly 33	40	..	..	18½	14½

Year ending				Underground Shift-men.		Surface Shift-men.	
				Shift.	Week.	Shift.	Week.
				s. d.	s. d.	s. d.	s. d.
30th April, 1914	..	..	..	11 0	68 2	10 0	59 0
„ 1917-18	..	..	..	13 0	78 11	12 0	69 11
Increase per cent.				18½	15½	20	18½

Average yearly wage for miners, 1917-18, equals £302 6s. All workers got increased wages, but only the miners increased their weekly earnings more than the daily wage.

(i.) *Mine G* :—

Year ending	Miners.		Shift-men.		Truckers.		Surface.	
	Shift.	Week.	Shift.	Week.	Shift.	Week.	Shift.	Week.
30th April, 1913-14 ..	s. d. 15 2·51	s. d. 68 5·29	s. d. 11 7·52	s. d. 69 6·33	s. d. 10 5·53	s. d. 47 8·41	s. d. 10 8·77	s. d. 56 6·62
„ 1917-18 ..	19 6·41	78 1·64	13 9·38	83 9·51	12 2·94	59 7·06	12 8·62	71 11·83
Increase per cent. ..	28	12	19	20½	17	25	18½	27

All increased, both daily and weekly, and all, except miners, increased the weekly wage at a greater rate than the daily. The surfacemen show greater increase in weekly wages. Highest daily wage, miner, 19s. 6·41d.; highest average weekly wage, underground shift-man, 83s. 9½d.

(j.) *Mine H* :—

Year ending	Miners.		Truckers.		Surface Shift-men.		Underground Shift-men.	
	Shift.	Week.	Shift.	Week.	Shift.	Week.	Shift.	Week.
30th April, 1913-14 ..	s. d. 15 9	s. d. 74 10	s. d. 10 2	s. d. 50 10	s. d. 9 2½	s. d. 48 4	s. d. 11 7	s. d. 68 0
„ 1917-18 ..	19 3	98 8	12 6½	67 7	11 2	59 9	14 3	88 8
Increase per cent. ..	22½	32	23	33	22	23½	23	30½

The last six months of the year to April, 1918, show an increase in weekly earnings over the average for the year. All increase the weekly wage more than the daily, especially the miners, truckers, and underground shift-men.

(k.) *Mine I* :—

One miner who worked constantly for the year ending 30th September, 1917, earned over £300.

Miners working full time earned from £9 2s. 9d. to £17 5s. for the fortnight ending 30th September, 1918, just previous to our visit.

(l.) *Mine J* :—

Year ending	Miners.		
	Daily.	Weekly.	Annual.
31st March, 1913-14 ..	£ s. d. 0 17 11·11	£ s. d. 3 14 5·14	£ s. d. 193 10 0
30th September, 1918 (six months) ..	1 4 7	5 10 7·5	287 10 0
Increase per cent. ..	37	48½	..

(m.) *Mine K* :—

Year ending	Miners.		
	Daily.	Weekly.	Annual.
31st March, 1915-16 ..	£ s. d. 0 17 6·92	£ s. d. 3 15 0·46	£ s. d. 195 0 0
30th September, 1918 (six months) ..	1 0 6·11	3 17 8·37	202 0 0
Increase per cent. ..	16½	3½	..

(n.) The following return shows the number of days worked, and the daily, weekly, and yearly average of the net wages of the miners (coal-hewers) at Mine J :—

Year ending	Days worked.	Daily Average.	Weekly Average.	Yearly Average.
31st March, 1913-14 ..	216	£ s. d. 0 17 11·11	£ s. d. 3 14 5·14	£ s. d. 193 11 11·76
„ 1914-15 ..	246	0 16 5·12	3 17 8·06	201 18 11·52
„ 1915-16 ..	237	0 18 0·32	4 1 11·61	213 12 3·84
„ 1916-17 ..	256	0 19 6·44	4 16 1·93	250 1 4·64
„ 1917-18 ..	219	1 3 6·67	4 19 2·43	257 18 6·73
30th September, 1918 (six months) ..	117	1 4 7	5 10 7·50	287 12 6

(o.) Return showing the number of days worked, and the daily, weekly, and yearly average of the net wages of miners (coal-hewers) at Mine K:—

Year ending	Days worked.	Daily Average.	Weekly Average.	Yearly Average.
		£ s. d.	£ s. d.	£ s. d.
31st March, 1915-16	222	0 17 6·92	3 15 0·46	195 2 0·24
„ 1916-17	262½	0 17 4·66	4 7 9·33	228 4 5·25
„ 1917-18	197½	0 19 9·54	3 15 2·19	195 9 6·15
30th September, 1918 (six months) ..	98½	1 0 6·11	3 17 8·37	101 0 1·83

NOTES TO (n) AND (o).—1. The first war bonus of 10 per cent. was paid to all employees at Mines J and K on the 20th March, 1916.

The second war bonus of 7½ per cent. to contract workers (coal-hewers) and 10 per cent. to all wages-men, making in all 17½ per cent. to coal-hewers and 20 per cent. to wages-men, was paid on the 18th June, 1917.

The third war bonus of 7½ per cent. to contract workers and 10 per cent. to wages-men, making a total of 25 per cent. to contract workers and 30 per cent. to wages-men, was paid on the 23rd September, 1918.

2. The “go-slow” policy (when the miners reduced the output and their average daily earnings) was in vogue from the 12th February, 1917, until the 3rd April, 1917, following which there was a general strike, lasting three weeks.

During the period of the “go-slow” policy the miners reduced their daily earnings on an average 5s. per day.

5. REAL EARNINGS OF MINE WORKERS.

It is an established fact that there has been a considerable rise in the actual money earnings of mine workers since 1913, and that in most cases the rise in daily earnings has been greater than the mere rise in the rates of pay. But higher money wages do not necessarily mean higher real wages; for, in estimating these, account is taken of all the advantages and disadvantages peculiar to the employment and associated with the money wages paid, and the balance of net advantages is thus ascertained. This balance, therefore, may vary in a manner different from the money wages, and, since in the long-run the worker's attitude towards his work is largely the result of the amount and character of these net advantages, and as the supply of future labour will fluctuate according to changes in them, *it is necessary to inquire how the net advantages of mine-work have been affected during the period under investigation.*

(i.) The mere *amount of money paid as wages* per day or week is the chief factor with the less prudent or foreseeing workers. This, as ascertained in previous sections, has increased considerably.

(ii.) A very important consideration is the *purchasing-power of that amount*. The value of a given wage—say, £1—may be different in different localities at the same time or at different (and not necessarily remote) times in the same locality, since the prices of the commodities and services ordinarily required by the wage-earner vary according to time and place, and money has no value except to purchase directly or indirectly goods in exchange for its tender. A weekly wage of £5 received in 1914, when the purchasing-power or value of money was higher than in 1918, is clearly a lower real wage than the same wage at the latter date. This introduces the subject of the cost of living of miners, subject No. 7 of our order of reference, which is of sufficient importance to be reserved for a separate chapter (see Chapter VI, p. 77). *It is sufficient here to state the general result of this particular inquiry*—first, that there has been a lowering of the value of the money unit in relation to necessities and common comforts of about 35 per cent. since 1913; secondly, that the consequent depreciation of the *value* of the average amount of wage received by mine workers in 1913 has not been altogether counterbalanced by the increase in the *amount* of the average wage since that time; and, thirdly, that the readjustments of the amount of wage to changes in prices have not been made so that the changes should practically coincide: in other words, that the changes in wage rates have lagged behind the changes in prices. (This statement is made without here passing any judgment on the question as to whether wage rates should be revised so as to change proportionately to prices.)

(iii.) Almost as important as the value of the money earnings are the two related but not quite identical factors, *regularity and constancy of employment*. A daily or weekly wage of a given amount is high or low according to the amount of employment available at that wage. The period commonly taken over which to measure that amount is the year, since it is the shortest period which includes the whole range of the seasons, the changes of which have such a direct effect on the amount and character of the work required in a great many industries. It is also a period short enough for the ordinary worker to take into view when deciding whether to offer or withhold his labour in a particular trade or at a particular wage. The amount of wage earned in the year is therefore a better measure of the real earnings than the actual daily, weekly, or monthly earnings. The distribution of work over the year—*i.e.*, whether there are periods of alternate high and low employment (regularity of employment), or whether the employment is evenly spread over the year (constancy of employment), is comparatively unimportant, provided there is an assured yearly amount of work available. The statistics of actual daily earnings given in the earlier sections of this chapter have therefore, in many cases, been converted (or made easily convertible) into figures of yearly earnings—*i.e.*, allowance has been made for employment and unemployment during the year. The amount of unemployment may be due to the worker's own voluntary action, as when being fit for work he refrains though the mine is open, or to causes which he cannot completely control, such as his own sickness or the closing of the mine through floods or lack of transport. This problem of lost time has been already discussed in Chapter II, with special reference to its influence in reducing or increasing the cost of producing coal. It is sufficient to mention here that there is no doubt that the average miner in New Zealand could, if he had so willed, have secured an increasing amount of employment per year since 1913. There were more mines, the number of possible working-days at the mines showed no appreciable diminution

on the average, the number of miners decreased, and the demand for coal rose—all tending to increase the total amount and the constancy of employment. *A rise in money earnings per day, therefore, in this period carried with it also the possibility of a still greater rise in annual earnings, owing to more employment being available, and this without prejudice to health and efficiency.* Thus, viewed from this standpoint, real wages tended to increase beyond the amount suggested merely by the actual rise in daily remuneration. This was a force operating to counteract to some degree the fall in real wages occasioned by the fall in the value of money and the lag of wages behind retail prices. The degree to which the workers availed themselves of the opportunity thus to offset falling real wages is suggested, roughly, by the facts summarized in Table 80, though the most significant figure, the number of weeks worked over the whole year per miner, is not definitely calculable from the available data.

(iv.) In assessing the real wages of mining we must, on the one hand, reckon in *the money worth of any perquisites, bonuses, supplementary earnings, &c., received, and, on the other hand, deduct or make allowance for any peculiar expenses to which the miner may be liable, expenditure on purchase and upkeep of tools, extraordinary expenditure on clothes, or on rent.* It is then necessary to inquire how far these peculiar sources of income and expenditure have varied during the war period.

In a few cases the mine worker is offered the opportunity of obtaining grazing for a horse or cow at a specially low rate; a common item on the income side is *the low price at which he purchases his coal.* At all collieries it is customary for mine workers to obtain their coal at a much lower price than that paid by the ordinary consumer. The amount of coal sold to employees at the Point Elizabeth and Liverpool State Mines for the year ending the 31st March, 1918, was 2,558 tons, or 5½ tons per adult man employed, representing a bonus of over £3. In most cases the price charged is below the cost of production. The case of the State mines is typical.

TABLE 82.—SHOWING LOSS DUE TO COAL BEING SUPPLIED TO EMPLOYEES AT 3s. PER TON, SINCE THE YEAR ENDING 31st MARCH, 1913, TO THE HALF-YEAR ENDING 30th SEPTEMBER, 1918, AT THE STATE COLLIERIES.

Year.				Tons.	Cost per Ton.		Rate to Workmen.	Loss per Ton.		Total.	
					s.	d.	s.	d.	s.	£	s. d.
1913	..	..	..	2,705	8	1·76	3	0	5	1·76	705 19 6
1914	..	..	..	2,190	8	1·76	3	0	5	1·76	563 9 5
1915	..	..	..	3,030	7	8·24	3	0	4	8·24	710 0 7
1916	..	..	..	3,022	6	10·13	3	0	3	10·13	579 4 2
1917	..	..	..	2,935	7	4	3	0	4	4	635 19 2
1918	..	..	..	2,558	7	6·88	3	0	4	6·88	575 1 0
1918 (half-year)	..	..	..	1,787	7	11·78	3	0	4	11·78	446 15 0

The figures shown in the last column (total) above represent the Department's annual loss through supplying employees with coal at a price less than it costs to produce. The difference between the price to the workmen and the price to the public at the pit-mouth is shown in the following table:—

TABLE 83.

Year.				Tons.	Selling-rate to Public.*		Workmen's Rate.	Loss per Ton.		Total Loss.	
					s.	d.	s.	d.	s.	£	s. d.
1913	..	..	..	2,705	13	2	3	0	10	2	1,375 0 10
1914	..	..	..	2,190	13	2	3	0	10	2	1,113 5 0
1915	..	..	..	3,030	13	2	3	0	10	2	1,540 5 0
1916	..	..	..	3,022	14	6	3	0	11	6	1,737 13 0
1917	..	..	..	2,935	14	6	3	0	11	6	1,687 12 6
1918	..	..	..	2,558	14	6	3	0	11	6	1,470 17 0
1918 (half-year)	..	..	..	1,787	16	3	3	0	13	3	1,183 17 9

* At the mine for "run of the mine" or through coal—i.e., as the coal comes from the face.

The following table shows the prices charged the mine workers for coal at the different mines. Since there has been little or no change in these prices during the period, whilst prices to the public have increased considerably, the mine worker, in regard to this particular expense, is relatively to other workers in a better position than in 1913:—

Mine.	Price of Coal to Employees, per Ton (cartage excluded).	
	s.	d.
Denniston	3	0 (miners).
"	4	0 (shift-men).
Millerton	3	9
Westport-Stockton	5	6
Pukemiro	3	1 (2s. per load of 13 cwt.).
Taupiri	5	0.
Kaitangata	12	6 (including delivery).
Nightcaps	9	0

In some occupations the *opportunities for employment open to members of the wage-earner's family* are important elements in estimating the net advantages of the occupation. The wage to be

compared in such cases is a family rather than an individual wage, but in mining in New Zealand this is not an important consideration; the mine worker's earnings are not supplemented to any appreciable extent by assistance in his own employment from members of his family. His boys may easily obtain employment about the mine at work specially suited for boys. Though the opportunity they enjoy of obtaining an entry into work leading to their father's occupation may be greater than that of boys in general, the effect of this is offset by the comparatively narrow choice of employments in the average mining township and the limited means of educating children for the various branches of industry and commerce.

In the remoter mining camps the prices of the ordinary necessities and comforts of life are raised much by the expense of transport, which forms a considerable part of their total price; but this particular factor is taken account of in the inquiry into the cost of living and the purchasing-power of the actual money earnings, and must not be reckoned twice. As regards the amount actually paid as rent the miner's position is much more favourable than that of the majority of workers. The nature of the house-room and general domestic conveniences obtained for different rents is described in Chapter VII. Defective as these are it is questionable whether better could be obtained in the towns for the same rentals. The evidence showed that rents generally had not advanced in the mining townships during the war period, so that there could have been no tendency to lower real wages from this cause.

The chief forms of expenditure associated directly with the peculiar nature of the miner's work to be defrayed out of his wages are *working-boots, tools, light, and explosives*.

The wear-and-tear on boots in underground mine-work is very heavy, particularly for the trucker, who wears out twice as many boots as the miner. According to the evidence given by shopkeepers, the price of working-boots used by mine workers has increased between 1913 and 1919 by about 10s. 6d. per pair on the southern fields and 12s. 6d. on the West Coast and northern fields. The increased annual cost to the miner, including the rise in the cost of repairs, is estimated at not less than £1 10s. on the average, and to the trucker at not less than £3.

In nearly all cases the miner provides his tools at his own expense; but in one mine the company provides tools at cost price, and buys them back again from the miners if they leave. The tools are sharpened and kept in order by the companies. The cost of the hewer's outfit of tools has just about doubled during the war period, having risen from about £4 10s. to about £10. Some of the tools, such as banjo shovels and certain boring-machines, have been unprocurable over the latter part of the period. The miners' annual expenditure on renewal and maintenance of tools varies from district to district according to the nature of the coal. It has increased from about £2 10s. to £4 a year.

In most mines the miner provides his own lamp and illuminant—carbide or colza or other suitable oil. Colza-oil has increased from 4s. and 4s. 6d. a gallon in 1914 to 9s. and 10s. 6d. a gallon in 1918 according to the locality. The miner estimates the daily cost of lighting where colza is used at 5d. in 1918, compared with 3d. in 1914. This would mean an additional expense of about £2 in the year. Lamps of all kinds have increased from 66 to 75 per cent. in price, and carbide by 400 per cent.

Explosives are used in many of the mines to break down the coal. Mention has already been made of the many complaints of both men and management regarding the deterioration in the quality of explosives available since the early part of the war, and the consequent effect on output. The nature of the commodity is such as to make it desirable that its supply shall be arranged for by the companies, who deal it out to the men at an agreed price, deducting the amount used by each pair of miners from their gross fortnightly earnings. The price is now generally much below the cost price to the companies, who treat the loss as part of the cost of production. For example, one mine returns its loss on explosives as 0.451d. per ton of coal mined for 1917, and 0.36d. for 1918. The miner may use as much as 4s. worth of explosives in a day, even though the company bear part of their cost. We may again illustrate the general position by reference to the State mines. The difference between the gross and net earnings (given to the nearest penny) set out in Table 84 is the price charged the miners for the explosives used in coal-winning. The difference in the amount of this price is generally accounted for by differences in the hardness of the coal. The Liverpool coal, for example, is much harder than the Point Elizabeth coal. The daily output per miner is added to give some idea of explosive-cost per ton.

TABLE 84.—SHOWING COST OF EXPLOSIVES TO MINER IN WINNING COAL.

Year.	Point Elizabeth.				Liverpool.			
	Daily Average Gross Earnings.	Daily Average Net Earnings.	Difference: Explosives.	Output per Miner.	Daily Average Gross Earnings.	Daily Average Net Earnings.	Difference: Explosives.	Output per Miner.
	s. d.	s. d.	s. d.	T. c.	s. d.	s. d.	s. d.	T. c.
1913-14	18 7	17 11	0 8	7 2	..	..	..	..
1914-15	17 1	16 5	0 8	6 9	..	..	..	..
1915-16	18 10	18 0	0 10	7 7	19 1	17 7	1 6	6 5
1916-17	20 3	19 6	0 9	7 7	19 0	17 5	1 7	5 14
1917-18	24 3	23 7	0 8	78 4	21 10	19 10	2 0	6 8
September, 1918 ..	25 4	24 7	0 19	8 5	22 5	20 7	1 10	7 18

Prior to November, 1915, explosive was sold to the workmen in the State mines at 1s. 1d. per pound, and "electric detonators" at 2d. each, but owing to the price of the explosives being increased by 10s. per 50 lb. case the rate to miners was increased correspondingly. The miners have therefore been paying since November, 1915, 1s. 3d. per pound for explosive and 2d. per detonator. Although the price of explosives and detonators has increased considerably of late the increased rate has not been passed on to the men. The Department of Mines is therefore bearing a loss of £1 7s. 6d. per 50 lb. case on explosives, and 13s. per 100 on detonators. On an average twenty 50 lb. cases of explosives are used weekly, and about one thousand one hundred detonators. The present price of explosive is £4 10s. per 50 lb. case at Greymouth, to which must be added freight and handling, equivalent to about 1s. a case. It is retailed to the miners at 1s. 3d. per pound. Electric detonators cost at Greymouth £1 9s. 8d. per 100, and are retailed to the miners at 16s. 8d. per 100.

Generally speaking, the increased cost of explosives over the period has been shared between company and miner; the companies have raised the price to the miners, but not to the extent to which the price has been raised to them by the manufacturers—e.g., at one mine the price to the company has been raised from 9d. to 1s. 8d. a pound, the miners getting their supply for 1s. The deterioration in the quality of the explosives has, of course, operated as a further rise in price. It is the custom for the charge for explosives to be deducted from the miner's fortnightly pay. In the statistics of wages quoted in this report this deduction has already been made, only net wages being quoted. The rise in the price of explosives to the miner may in some cases have involved an additional expense of as much as £12 a year, but the cost varies from mine to mine over such a wide range that the increase in some cases is trifling; on the average for the Dominion it would probably not exceed £4.

The change from blasting-powder to permitted explosives, which was made compulsory in some mines, was alleged by the miners in one case to have reduced their wages. The records of cost of explosives per ton, however, show a very slight alteration after the introduction of the permitted explosive and in the direction of a decrease, not increase. The Chief Inspector of Mines is of opinion that, since the permitted explosives are not such powerful disruptive agents, the men do not get so much coal in a day by their use as they got formerly. Considerations of safety, however, demand the rigorous enforcement of the law, making their employment compulsory in most of our bituminous mines, as is done in Great Britain and Australia.

It is clear that in earning the net wage paid him by the companies the coal-miner, and to a less degree the other mine workers, have been put to increased expense for working-gear during the war period. This increase may be assessed as being at the least at the rate of about £10 per year for the latter part of the period.

(v.) *Finally, there is a group of important factors that influence every intelligent worker in assessing the sum total of the real remuneration of the employment open to him and deciding whether to enter it, or, being already in the occupation, to continue in it. These are no less powerful because they are many of them difficult to measure in terms of money. Such are—the agreeableness or disagreeableness of the work in itself; the length of the working-day; the amount of leisure available in the year; the chances of success, and the opportunities for promotion; the degree at which the occupation stands in public esteem; its effect on the worker's health and on the length of the effective working-period of his life; the extent to which it cramps or enlarges the worker's sense of personal freedom; and the opportunities its pursuit affords for the exercise of the faculties which the average man delights in using, and for the enjoyment of those pleasures, high and low, which the social standards of the day approve as worthy objects, whatever may be their value in the eyes of the moral philosopher. It is in respect of many of these that the life of the miner appears to the ordinary worker to be at a disadvantage, when compared with the generality of occupations open to himself or his sons, and to require high money earnings in order that its real wages may tend to equality with those in other callings that appeal to him.*

Underground work in itself tends to repel the normally constituted man, who will demand some compensation in the rate of pay for his loss of sunlight and pure air. Though coal is a "clean dirt," working in it, especially in wet places or on fields with a wet climate, is attended by many domestic inconveniences which the installation of roomy and properly equipped bathhouses at the mines is only now beginning to remove. It is unfortunate that in many cases the erection of these has been retarded by the shortage of plumbing and other necessary materials. Miners work in pairs, and are in close touch with one another and with the truckers, and this circumstance tends to alleviate the drawbacks of underground work, satisfying the natural gregarious instinct of man. There is no doubt that the fact that mining brings men to dwell together in numbers, with interests that are common beyond the average degree of community of interest reached by our townships in general, tends to make it attractive, as well as accounts for some of the strong corporate spirit shown by mining populations. Mining, too, is an operation which demands certain qualities of skill, physical strength, endurance, and of character, the development of which is congenial to a vigorous healthy man. Hand, eye, and brain are constantly exercised; there are problems to solve calling for some initiative and resourcefulness; and the hour of peril evokes some of the noblest examples of self-sacrificing courage and generosity. That the occasions for these occur almost daily in our mines and never fail to provide examples is unknown to the public, whose attention is occasionally drawn by the more spectacular, the "explosions" and "disasters," but passes unnoticed the simple "nameless unremembered acts of kindness and of love."

The *hours of labour* are such as to allow a fair share of daily leisure to the miner. Though the miner spends eight hours in the mine, his time at the coal-face varies from six to seven hours.

Miners in wet places usually spend six hours from bank to bank, and receive in addition to their ordinary pay a bonus of 4s. to compensate for the two hours short time. But there are not a few mines *where the distance to be traversed between home and pit-mouth is so long* as greatly to reduce the miner's free time, and also, especially where the travelling-places are rough, wet, or steep, as well as long, to impair his efficiency in the mine. The amount of walking done by considerable numbers of miners in order to get to their work is remarkable, especially when it is remembered that within any old-established mine itself the travelling-distance between mouth and working-face is generally not less than half an hour. Where the distance is traversed by train or other conveyance the fare has to be deducted from the wage. Only in one or two mines are the companies able to transport the men to their work.

Apart from the necessity to labour for his living, which is the common lot of the great majority of mankind, if not all, *the miner enjoys considerable freedom*. A witness with as intimate a knowledge as anybody of the actual conditions of coal-mining work of all kinds in New Zealand over a great many years gave his opinion that "the miner to-day as a working-man has the best conditions of any working-man in New Zealand, and is better paid for the work done." When asked to express himself with more detail he added, "The miner is practically his own boss, he is on the tonnage rate, and he works when he likes. In any mine he can make from £1 5s. to £1 10s. a day. I do not think there is any other labourer that can do that. That is done in six hours' actual working-time." This may be accepted as substantially true, with slight modification of the figures for the average miner's possible wage and working-day. The freedom to work when he likes extends largely also to the freedom to work how he likes, for the miner's influence on methods of work exercised through his check inspectors, &c., and union is not inconsiderable, and restrictions imposed from without are mainly in the interests of his safety in common with the preservation of the mine.

The opportunities for promotion appear to be at least as numerous as in the majority of occupations of similar status. The many positions in the mines above the grade of miner are nearly all filled by men who began life at the lowest grade; this is a striking testimony to the "vertical mobility" of labour and the commendable policy of the companies of rewarding skill and honest service.

The mine worker as an individual enjoys no less social esteem, nor fewer social privileges, than those that are the lot of the average worker in our democratic society. Miners as a class have perhaps drawn more public criticism upon themselves than most other classes in recent years, because of the frequency of mine strikes in times of national stress. But there is no evidence that mining requires to be paid at a higher rate in order to attract men into the industry because of any social opprobrium attached to it as an occupation.

That such a higher rate is necessary because of the character of the general social environment of the mining townships or "camps" is undeniable, and should be perfectly intelligible after an examination of the facts described in Chapter VII below.

The final factors for consideration in the attempt to assess the miner's real earnings are those which influence *the length of his working-life*. Their results are summed up in the accident, the morbidity or sickness, and the death-rates of coal-miners.

The liability of coal-miners to accident may be measured by the ratio of total accidents reported in a given time to the total number of miners employed, or the total number of tons mined in that period. Unfortunately, the definition of a reportable accident varies from time to time, and the number of accidents officially recorded varies also with the closeness of the inspection and any legislative changes in the financial consequences of a reportable accident to the worker. Statistics of total accidents are therefore of little value as a means of comparing the safety of different trades or the same trade at different times. But this defect does not apply to the same extent to fatal accidents. These have always been more or less faithfully recorded, and constitute in themselves a better measure of safety.

In coal-mining statistics it is usual to take as the index of danger the number of fatal accidents occurring in the industry as a whole during a given time per 1,000 persons employed in and about mines, or per million tons of coal raised during that time. The latter is the better index, because the length of the working-day varies from time to time. Table 85 gives these indices for New Zealand coal-mines.

TABLE 85.—FATAL ACCIDENTS IN NEW ZEALAND COAL-MINES.

Year.	Total Persons employed above and below.	Lives lost.		
		Per Million Tons raised.	Per 1,000 Persons employed.	Number by Accident.
1878	513	*	*	..
1879	802	194.64	44	35†
1880	1,038	6.66	1.92	2
1881	963	2.96	1.04	1
1882	1,043	5.28	1.91	2
1883	1,249	4.74	1.6	2
1884	1,283	6.23	2.34	3
1885	1,483	5.87	2.01	3
1886	1,605	*	*	..
1887	1,499	7.16	2.66	4
1888	1,689	6.51	2.36	4

* No life lost.

† Year of Kaitangata explosion.

TABLE 85.—FATAL ACCIDENTS IN NEW ZEALAND COAL-MINES—continued.

Year.						Total Persons employed above and below.	Lives lost.		
							Per Million Tons raised.	Per 1,000 Persons employed.	Number by Accident.
1889	..	..	..	..	..	1,717	6.82	2.37	4
1890	..	..	..	..	..	1,846	12.55	4.33	8
1891	..	..	..	..	..	1,693	5.98	2.36	4
1892	..	..	..	..	..	1,681	1.48	0.66	1
1893	..	..	..	..	..	1,888	7.23	2.64	5
1894	..	..	..	..	..	1,899	8.33	3.16	6
1895	..	..	..	..	..	1,799	6.88	3.33	5
1896	..	..	..	..	..	1,937	83.24	34.07	66*
1897	..	..	..	..	..	1,912	4.75	2.09	4
1898	..	..	..	..	..	2,003	1.1	0.49	1
1899	..	..	..	..	..	2,153	3.07	1.39	3
1900	..	..	..	..	..	2,460	3.65	1.62	4
1901	..	..	..	..	..	2,754	2.42	1.09	3
1902	..	..	..	..	..	2,885	1.46	0.69	2
1903	..	..	..	..	..	2,852	2.81	1.4	4
1904	..	..	..	..	..	3,288	2.6	1.21	4
1905	..	..	..	..	..	3,269	3.78	1.83	6
1906	..	..	..	..	..	3,692	3.46	1.62	6
1907	..	..	..	..	..	3,910	6.55	3.07	12
1908	..	..	..	..	..	3,894	2.68	1.28	5
1909	..	..	..	..	..	4,191	3.65	1.79	7
1910	..	..	..	..	..	4,599	7.28	3.55	16
1911	..	..	..	..	..	4,290	6.77	3.26	14
1912	..	..	..	..	..	4,328	4.13	2.08	9
1913	..	..	..	..	..	4,250	3.18	1.38	6
1914	..	..	..	..	..	4,734	21.53	10.35	49†
1915	..	..	..	..	..	4,156	4.07	2.16	9
1916	..	..	..	..	..	3,988	2.65	1.5	6
1917	..	..	..	..	..	3,983	1.93	1	4

* Year of Brunner explosion.

† Year of Ralph's (Huntly) explosion.

The methods by which coal is mined, of course, influence the accident rate, and methods vary according to the nature and character of the coal-seams, the depth of the mines, and local customs. Evidence was given that the use of machines in certain New Zealand mines reduced the number of accidents considerably. Comparisons of accident rates between different countries need to be interpreted in the light of information about differences in methods of working, in intelligence and skill of miners, &c. The mere accident rates themselves may be deceptive. With this caution we quote the following table giving an international comparison from "Hoffman on Fatal Accidents in Coal-mining" (U.S.A. Bureau of Labour, 1910).

TABLE 86.—FATAL ACCIDENTS IN COAL-MINING.

Comparison of Fatal-accident Rates in Coal-mining Countries for the Period 1897 to 1906.

Country.						Total Number of Employees at Work One Year.	Fatal Accidents.	
							Number.	Rate per 1,000 Employees.
North America	..	..	..	..	..	5,179,343	16,273	3.13
Japan (1902-1906)	..	..	..	..	..	438,259	1,355	3.09
Russia, Finland (1901-1903)	..	..	..	..	..	330,147	805	2.44
Victoria	..	..	..	..	..	7,902	18	2.28
New South Wales	..	..	..	..	..	124,940	267	2.14
Prussia	..	..	..	..	..	4,389,174	9,327	2.13
France	..	..	..	..	..	1,629,177	2,944	1.81
New Zealand	..	..	..	..	..	27,268	37	1.36
Austria	..	..	..	..	..	1,186,510	1,599	1.35
United Kingdom	..	..	..	..	..	7,973,031	10,319	1.29
Queensland	..	..	..	..	..	11,714	14	1.20
Belgium	..	..	..	..	..	1,322,516	1,401	1.06
India (1898-1906)	..	..	..	..	..	790,070	676	0.86

The risk of fatal accidents in New Zealand in this period of ten years was therefore comparatively low ; but during the next ten years 133 persons lost their lives by accident, more than doubling the number per 1,000 persons employed.

According to the Mines Statement for 1917, *New Zealand in recent years compares most favourably with Great Britain, which stands ahead of all other countries as regards the low proportion of fatal colliery accidents.* For comparison it may be stated that during the past four years at British collieries fatal accidents per 1,000 persons employed amounted to 1.53, 1.35, 0.73, and 1.22 respectively, and per million tons of coal raised to 4.84, 3.75, 3.64, and 4.36. The fatal-accident rate in respect of mine workers in New Zealand collieries is not greater per 1,000 employees than the corresponding rate on the railways, though it is considerably higher than that for factory workers in the Dominion.

The Mines Department publishes each year a detailed description of the facts and surrounding circumstances of individual accidents, exhibiting precisely the conditions in which the accidents occurred. This permanent and accurate record should be of great value in devising means of minimizing the number of serious accidents in the future.

Judging by the evidence given by a medical officer in a large mining district *the liability to slight accident is considerable*. In one mine with about three hundred and fifty workers it was stated that accidents of this nature, for which miners consulted their medical officer, occurred at the rate of eighteen a month from January to August of 1918, the average duration of the patient's absence from employment on account of such accident being estimated at three to four weeks.

The same medical practitioner stated that there is not much interruption of work among miners owing to illness apart from the results of accident, although he is of opinion that coal-mining makes a greater drain on the nervous and muscular systems than the work of agricultural or general labourers. There is no doubt, too, that the use of the ordinary safety-lamp has harmful effects on eyesight. The influence of their occupation upon the health and average length of life of coal-miners has been the subject of much scientific investigation abroad of recent years, to which brief reference may be made in view of the absence of any considerable body of reliable local data. The ascertainment of the true connection between occupation and health and longevity is hedged round with difficulties, because of (i) the rapid change in medical knowledge and the power of diagnosing the true nature of diseases; (ii) the movement of individuals from one occupation, where they may have developed the disease ultimately causing death, into a different trade; (iii) the existence of numerous occupational diseases which do not directly cause death; (iv) the occurrence of secondary and ultimate diseases which cover up the condition that originally caused or accelerated death; and (v) the presence along with the occupational factors, such as coal-dust, of other factors due to locality, &c., which may vary greatly over different coalfields.

Coal-workers generally show a high proportionate rate of death from accidental violence, though, as pointed out above, this rate is low in New Zealand compared with countries in general. They show a low proportionate death-rate from pulmonary tuberculosis or consumption of the lung, and this relative freedom has been proved to be the resultant of occupational conditions which in some manner protect coal-miners from the fatal consequence of tuberculous infection. Dr. J. S. Haldane, F.R.S., writing in September, 1918, summarizes the more important results of recent research in Great Britain into diseases peculiar to coal-miners. He says,—

“Coal-mining in Great Britain is on the whole a very dusty occupation, but there is no evidence in the mortality returns for either young or old colliers that dust-inhalation has hitherto caused appreciable danger to life in British coal-mining. The death-rate among miners from lung-disease is in England at all ages up to fifty-five not only far below the average for other employments, but even slightly lower than for farm labourers. The death-rate for phthisis alone is also slightly lower than for farm labourers. It is proved that coal-dust and shale-dust, unlike flint-dust or quartzite dust, entirely disappears from the lungs and body in time. It can be realized quite readily what is happening in the lungs of a coal-miner breathing large quantities of coal-dust and shale-dust, as compared with what is happening in the lungs of a gold-miner breathing quartzite dust. As fast as the dust goes in day by day to the coal-miner's lungs it is carried out again by the dust-cells. His lungs, it is true, are probably always more or less black; but, on the other hand, what he coughs up is black and full of the dust on its way out again. His black spit is in truth his salvation. On exposing the animals experimented on to relatively small daily doses of coal-dust or shale-dust, and continuing this over a long period, it was found that after a few days the dust in the lungs ceased to increase. The intake of dust was thus balanced by the output. From all that is known about similar physiological processes one may be fairly sure that the capacity for eliminating dust-particles grows with use. If this is so, the practice of constantly getting rid of coal-dust and shale-dust may help the lungs in eliminating other kinds of harmful particles such as tubercle bacilli, and may thus account for the remarkable fact that coal-miners are, and always have been since statistics were first available sixty years ago, extremely free from phthisis.”

Experiments carried out in England by the Medical Research Committee under the National Insurance Act have given very reassuring results as far as coal-mining is concerned. So long as the dust in a coal-mine is not explosive, and is not breathed in excessive quantities, it seems to do no harm, and possibly even does some good.

Many authorities hold that coal-dust has certain germicidal or antiseptic properties; others that it stimulates the lung-tissue and the growth of connective tissue. Coal-dust particles are round, unlike, in shape as in composition, the sharp flinty particles of stone-dust; but it is to be noted that much coal-dust contains a certain amount of stony particles, and that *there is sufficient reason for pursuing the inquiry whether the excessive mortality from non-tuberculous respiratory diseases, such as bronchitis, asthma, and pneumonia, among miners is due to dust-inhalation.* The occurrence of these among miners has, however, undoubtedly diminished with the improvement of mine-ventilation, and may result in part, as miners themselves often claim, from the fumes of explosives. The opinion of the Chief Inspector is that permitted explosives do not give as much noxious fumes as gelignite, and that if properly used in an adequately ventilated place they produce no noxious fumes whatever. Where the miner fires without under-cutting or side-cutting, making the explosive do much of the work which the coal-pick should have done, more explosive is used than ordinarily, and more smoke produced. In an indifferently ventilated place this would be injurious to health, and for it the men share the responsibility with the management.

In 1917 the U.S.A. Bureau of Labour published the results of an elaborate inquiry into the causes of death by occupation. In the table giving the average age at death in nineteen occupations coal-miners occupy the fifteenth place up the scale, with an average age of 51·3 years, this figure being exceeded only by general labourers, masons and bricklayers, blacksmiths, and farm workers. The average age at death for all the occupations cited was 47·9 years.

It would seem from a survey of the facts available, stated by the *Journal of the American Medical Association*, that the occupation of coal-mining is neither relatively nor absolutely unhealthy as compared with other means of gaining a livelihood. It has its special inconveniences and hardships, and is exposed to special dangers from accidents, but these can be, and are in New Zealand, reduced to small proportions by proper care, appliances, and legal restrictions. There is no doubt that in regard to health the New Zealand coal-miner is in a superior position to that of miners in any other country, and is at least as favourably placed as the great body of industrial workers in the Dominion. The war period has produced no noteworthy change in these particulars. The special diseases to which miners are liable seem to be largely preventable, and greater care and conveniences in changing from the equable atmosphere of the mine to the extremes of heat and cold outside would probably reduce the proportion of respiratory affections, except in particular cases where they may originate through fumes from explosives or the mine itself when ventilation is at fault.

CHAPTER VI.

THE COST OF LIVING OF COAL-MINE WORKERS.

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1. PRELIMINARY REMARKS.

THE real cost of living of a class of people may be defined as the sum of the exertions and sacrifices necessary to maintain the members of that class at a certain standard of living. This cost is measured and expressed in terms of money, and is usually taken to mean the total sum of expenditure involved in the maintenance of the given standard of existence and efficiency. Every one recognizes that the cost of living so expressed is subject to frequent changes, partly because of the unstable and changing character of the manifold forces that affect the supply of the necessaries and comforts of life and the amount of the total demand for them separately and as a whole, and partly also because of the fact that the supply of money, which measures the real cost, is itself a variable quantity and does not at once adjust itself to the changes in the supply of goods or the total population.

These changes in the cost of living, however, cannot be accurately determined simply by measuring the extent of the alterations in the prices of the goods and services appropriate to the given standard of living. Such a method is faulty—first, because it takes no account of the relative importance of the actual expenditure on each particular commodity and service; and, secondly, because it does not allow for those readjustments in the distribution of the expenditure over all the items that householders make upon the occurrence of any considerable change in the relative prices of commodities.

For the purposes of a trustworthy investigation into the extent of changes in the cost of living of a class there should be available for the period in question accurate records of (i) the nature of goods necessary for the customary economic efficiency and comfort of the class; (ii) the prices at which these goods are bought by the consumers; (iii) the manner in which the total expenditure is made up of the various items, and the proportion which each particular expenditure is of the whole expenditure; and (iv) the constitution of the average family in the class concerned and the data necessary for its reduction to that of the standard family, since, for the purposes of comparison, the consumption of families of persons of both sexes of varying ages must be expressed in a uniform standard unit, which is obtained by expressing the consumption of women and children in terms of that of men according to a scale scientifically determined

The principal method employed to obtain this necessary data is that of workmen's budgets of expenditure, which are collected in great numbers according to a uniform plan. All other methods are properly regarded as subsidiary or complementary to this. In New Zealand, unfortunately, this method has never been applied in such a way as to justify any important practical deductions. The inquiry conducted in 1910–11 by Mr. J. W. Collins, of the Labour Department, was a praiseworthy pioneer attempt which achieved certain suggestive results, but the number of returns sent in was insufficient and from too varied a class to found any practical rules of action upon the generalizations that were skilfully made from them.

It was the intention of the Board to carry out a thorough budget investigation in respect of the very definite class of worker and the particular localities involved in this coal inquiry. It was thought advisable to postpone the actual preparations of the budget-forms and their distribution until the Board had had the opportunity of personally inspecting the mining districts and the living-conditions of their population. It was in the midst of this inspection that the epidemic disorganized for a time the whole of the social life of the community. We felt that budgets collected over a period containing so much that was abnormal and the results of abnormal conditions would be but few and comparatively valueless; and it has been found impossible to arrange for this fundamental inquiry to be begun and completed during the period within which our report should be presented. In our opinion *it ought to be proceeded with at the earliest opportunity*, and a reference to it is included in our recommendations.

2. DATA EMPLOYED.

In the absence of the material provided by an intensive or extensive budget inquiry, we used the data provided in evidence tendered by shopkeepers on the mining-fields and by miners' representatives. This material was comprised mainly of quotations of prices of commodities in 1914 and 1918 used in miners' households. These price statistics were compared wherever possible with those of the Government Statistician for the nearest towns—that is, with those relating to Hamilton and Auckland in regard to the Waikato field, with those of Greymouth in regard to the West Coast, and

with those of Invercargill and Dunedin in respect of the South. Shopkeepers generally testified that, though their level of prices may be different, yet they move in the same direction as those of the neighbouring larger centres and in a similar proportion. *The data generally cannot be regarded as altogether satisfactory* either in respect to prices, comprehensiveness of range, definition of the articles included, the relative quantities consumed from time to time in the period, or the constitution of the average family, including its proportion of wage-earning members. These are matters of such vital importance, and their correct ascertainment is a question of the application of methods so numerous and complicated, that they should properly form the subject of a special though subordinate inquiry.

3. CHANGES REPORTED: PROVISIONAL RESULTS.

The price statistics collected were classified according to districts and submitted to the Government Statistician, who kindly calculated index numbers registering the changes they showed.

The prices of all foodstuffs, common household requisites, including light, and rent quoted in evidence showed increases between 1914 and the third quarter of 1918 of 74 per cent. for the Southern District (Kaitangata and Nightcaps), 68 per cent. for the West Coast, and 62 per cent. for the Waikato fields. These figures, however, are mere averages of prices and take no account whatever of the relative importance in consumption of the different commodities—for example, an increase of from 1s. 2½d. to 4s. 4d. per pound in the price of cream of tartar having the same weight as a rise of from 10s. 7½d. to 13s. in the price of sugar per 56 lb.

When these prices are weighted in accordance with the scale of relative weights used by the Government Statistician, and based on his view of the relative proportions of the commodities in question actually consumed in workers' households over the Dominion as a whole, the results obtained are very different. The former percentages (quoted in the last paragraph) are indexes of changes in *prices*; the percentages that follow are indexes of the most probable changes in the actual *amounts expended* on food and household requisites, including light, on the assumption (i) that the relative proportions are the same for the mining population as for the total population, and (ii) that these relative proportions have remained unchanged during the war period. Without a special inquiry, such as that hinted at above, there can be no substantial ground for either accepting or denying these assumptions. The percentage increases of actual expenditure thus determined are for the Southern Districts 50 per cent., for the West Coast 54 per cent., and for the Waikato 35 per cent., an average of 46 per cent. for the three. This may be compared with the Government Statistician's estimate of the increase of the average expenditure on groceries and foods other than meat for the whole Dominion between July, 1914, and September, 1918—viz., 43 per cent. approximately. Comparison may also be made with the movements in the Government Statistician's averages for the towns contiguous to the mine-fields. The increases for Hamilton, Greymouth, Dunedin, and Invercargill were approximately 39, 40, 45, and 46 per cent. respectively, or an average of nearly 43 cent., practically the same as for the Dominion as a whole.

The Secretary of the Miners' Federation presented certain price statistics in evidence. These were also weighted in a similar manner and the index of change calculated. This showed a considerably higher rate of change for the Northern District than the evidence of shopkeepers warranted, a slightly lower rate for the West Coast, and a slightly higher rate for the South, the average increase for the three being 56 per cent. If the section relating to prices in the North is eliminated from this particular evidence the general result (for West and South) is the same as that derived from the evidence of shopkeepers—namely, 52 per cent.

The evidence in regard to the changes in the price of meat varied very considerably from district to district, the range being as wide as from 30 to 84 per cent. The highest rate of increase was in the West, the lowest in the North. An estimate of 54 per cent. is the most reasonable from the available price data given directly in evidence and weighted according to the importance of the various cuts. The corresponding increase for expenditure on meat according to the Government Statistician's returns between July, 1914, and the end of August, 1918, for the whole Dominion was only 37 per cent., and for Dunedin, Hamilton, Greymouth, and Invercargill 35 per cent. The figures for September were 38 and 40 per cent. respectively. These differences suggest the necessity of caution in deducing any conclusion for practical purposes from the evidence tendered. *The opinion of the Board is that the increase in the expenditure on all foods, groceries, and light cannot, in view of all the available evidence, be assessed at more than 50 per cent., and that this estimate is necessarily very imperfect and would probably require revision after a more intensive special inquiry into this particular problem.* The Statistician's estimate of the increase in the expenditure on all foods (including groceries) for the whole Dominion between July, 1914, and August, 1918, is 41 per cent., and for Dunedin, Hamilton, Greymouth, and Invercargill 39 per cent. The corresponding figures for September, 1918, are 41 and 41 per cent. respectively. It is not likely that the *rate of change* in the expenditure on foodstuffs has been more than 25 per cent. higher in the case of the mining camps than in that of the towns close by, assuming in both cases that the relative amounts consumed are unchanged, and that the Government Statistician's data, which has been systematically collected and checked, is accurate.

Board and lodging has increased, according to the evidence, during the war period about 22 per cent. in the Southern fields, 37 per cent. on the West Coast, and 32 per cent. in the North. Rents in some localities have remained unchanged; in others there have been slight increases; the average rise is not more than 5 per cent.

Boots and common clothing-stuffs have shown the highest rates of increase in price, averaging about 75 per cent. for the mining-fields in general, being lower in the South than on the West Coast and in the North, where the evidence showed the rise to be about the same (about 85 per cent.). This figure represents, however, the rise in average *prices*, not in the average *expenditure* on clothing, since there is available no means of accurately weighting the items according to relative amounts used. The prices of working-clothes, socks, flannels, &c., as testified to by representatives of the Miners' Federation, have increased over all the fields on the average about 62 per cent. (ranging from over 70 per cent. in the Waikato to about 55 per cent. on the West Coast). The price of suits of clothes has increased about 40 per cent. in each locality. *A reasonable estimate of the increase in total expenditure on boots and clothing at pre-war amounts would be from 60 to 65 per cent. at the most.* If this estimate is at fault it probably slightly overestimates the rise.

The price of fuel to the miner has undergone but little change during the period. *Total expenditure on fuel and light together cannot have risen 20 per cent.*, which, according to the Government Statistician's estimate of relative expenditures for the Dominion, would be the extent of the increase in order to effect a rise of only 1 per cent. in the total cost of living.

Miscellaneous expenditure, such as that on fares, insurance, medical services, education, rates and taxes, &c., cannot be reasonably estimated to have risen more than about 25 per cent. over the whole; the real increase is probably less.

It remains to combine these results for the several classes of expenditure in order to ascertain the figure that shall measure the general rise in the cost of living. This is done by taking as bases the rises in each of the main divisions of expenditure and the only estimate available—that of the Labour Department inquiry of 1910–11—as to the relative importance of the contribution of each of these classes to the total expenditure. If the total expenditure in 1913–14 be represented as 100, the respective expenditures on food, rent, and fuel and light, clothing, and miscellaneous items are, according to the inquiry mentioned, 34, 20, 5, 13, and 28. Our approximate estimates of the rises in each during the war period on the mining-fields are 50, 5, 20, 65, and 25 per cent. It will be remembered that these percentages err, if at all, in the direction of overestimating the *rise in expenditure* as distinct from the rise in prices. *The combination of these two series of figures yields the final and general result of 35 per cent. increase in the expenditure on living by the mining population.* The following table summarizes these results:—

Total Expenditure on						1913–14.	1918.	Increase per Cent.
Food	..	..	..	..	..	34	51	50
Rent	..	..	..	..	..	20	21	5
Fuel and light ..	..	..	..	..	..	5	6	20
Boots and clothing	..	..	..	..	..	13	22	65
Miscellaneous ..	..	..	..	..	..	28	35	25
“Living”	..	..	..	..	..	100	135	35

From this it would appear that the increased expenditure on food, rent, fuel and light, and clothing has been sufficient to absorb an amount equal to the expenditure on all other items—that is, that on the average the rise in the cost of living between the middle of 1914 and that of 1918 could have been met, apart from increase in income or economy in these expenses, by a complete denial of satisfaction of all wants but those of food, &c.

It is again to be noticed that *this general result of an increase of 35 per cent. is obtained on the assumption, among others, that the distribution of expenditure over the various items of living is substantially the same as it was in pre-war time*, and that the results of the Labour Department inquiry of 1910–11 accurately measure these relative amounts. There is no doubt that, even allowing for the possibility of adjustment within food expenditure as prices have risen, the percentage of the total outlay which is represented by expenditure on food has risen, and that therefore the real rise in the cost of living is probably somewhat higher than 35 per cent.

4. COMPENSATING FACTORS.

The most important of the factors that have tended to counterbalance the rise in the cost of living to mine workers have been the rises in their rates of pay, which, together with improvements in the conditions of their work and opportunities of increased employment, have resulted in substantial additions to their actual earnings per annum. The additions to the actual earnings of miners appear in some mines to have reached 50 per cent., comparing the average for 1917–18 with that for 1913–14. In such cases the increase in earnings is more than sufficient to offset the increased cost of living. But it is to be noted that, though in many instances increased earnings beyond the actual increase in rates have been made possible through improved conditions of work, yet in many of these also there must have been accompanying drawbacks in the shape of increased exertion and a certain amount of overtime. These and similar factors have been mentioned in dealing in Chapter V with the question of real wages. Most of them, though sometimes important, are not capable of quantitative expression. It is, for example, impossible to state precisely how the war period has affected the *family income*, as distinct from the income of the head of the household, though any change in this respect must have a direct influence in tending either to counterbalance or aggravate the burden of rising expenditure

according as the total family income has risen or fallen. We can only repeat our belief that, in so far as the actual wages of miners (hewers) are concerned, they had risen by September, 1918, on the average by about 30 per cent., this average being derived, however, from figures relating to certain mines, and showing a wide range of rates of increase in actual weekly earnings from mine to mine of from 12 to 40 per cent. But the same cannot be said of the bulk of the other mine workers—viz., those who were on day wages—since, though their rates had risen 20 per cent. as against 17½ per cent. to miners, their opportunity of increasing their actual earnings beyond the percentage increase in rates was much more limited. In their case expenditure has probably risen more than earnings, and it is very doubtful whether the rise of 30 per cent. given in October, 1918, was sufficient to cover their increased expenditure at the old standard by that time, not to take account of the arrears of differences between the 20-per-cent. increase in rates given at the middle of 1917 and the rise in the expenditure during the intervening year and a quarter.

There is no doubt that the adjustments made in the *rates of wages* for all mine workers by means of the bonuses granted in 1916 and 1917 (as well as in 1918) lagged behind the increases in their expenditure on living at the pre-war standard. On the assumption that increased cost of house-room, fuel and light, clothing, and miscellaneous items, as estimated above up to September, 1918, was distributed over the war period in much the same way as the increased cost of all foods, which is worked out in detail by the Government Statistician, the living *expenditure* of the miner had increased by the end of May, 1916, when the first bonus of 10 per cent. all round was granted, to from 13 to 15 per cent.; by May, 1917, when the bonus was raised to 20 per cent. for day-workers and 17½ per cent. to hewers on their rates, the increased living-cost may be put at from 22 to 24 per cent. The latest increase of rates—namely, 25 per cent. to hewers and 30 per cent. to day-workers—was made when the expenditure on living had risen by about 35 per cent. In the meantime, in each case actual earnings had increased by more than the rates.

The general conclusion is that the increases in the actual earnings of those mine workers who are on day-wages have been slightly lower than the increases in expenditure on living, and have also lagged behind the latter, a factor aggravating the burden; that in the case of miners the increases in their actual earnings, taking the mines as a whole, were sufficient to compensate for the increased expenditure on living till the latter part of the period ending with the institution of our inquiry (September, 1918), when the increases to average actual earnings were overtaken by the continued rise in expenditure; and, further, that, since the increases in actual earnings were unevenly distributed over the various fields, there have been many miners, as well as day men, whose rates of expenditure on living at the old standard has increased in greater proportion than their actual earnings.

The effect of the increases of September, 1918, amounting to 25 per cent. and 30 per cent., as factors counteracting the rising expenditure on living, cannot be accurately determined until sufficient data as to actual earnings in normal conditions has been accumulated.

CHAPTER VII.

HOUSING AND SOCIAL CONDITIONS OF MINERS.

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1. HOUSING-CONDITIONS IN THE SEVERAL MINING TOWNS.

MUCH of the industrial unrest and dissatisfaction of the miners may be attributed to the sordidness of their housing-conditions and monotony of their home life. Early in the inquiry the representatives of the workers asked the Board to give special attention to housing-conditions; and the inspections which the Board made of the mining villages at Huntly, Pukemiro, Rotowaro, Glen Massey, Nightcaps, Kaitangata, Runanga, Blackball, Denniston, Burnett's Face, Millerton, and Ngakawau showed that in many cases the general conditions were exceedingly bad. Few of the houses in these townships reach the standard of comfort seen in the average workers' homes in our cities. There is no proper water-supply or drainage, and only in isolated instances are there bathrooms. The conditions generally are insanitary, and in certain fields the surroundings are dreary in the extreme. In spite of the disadvantages under which the occupants labour, some of the houses are kept in an excellent manner, and there are not a few well-cultivated gardens, tended with the greatest care and pride. But these stand out as isolated examples on these fields among the general mass of inconvenient, unhealthy, and crowded homes. As the Board felt that expert advice and assistance were necessary in this branch of its inquiry, the services of Mr. S. Hurst Seager, F.R.I.B.A., architect, of Christchurch, were secured. Mr. Seager paid visits to the townships mentioned above, with the exception of Nightcaps, and also inspected the mining camps at Avoca, Rewanui, Paparoa, and Stockton.

The following brief notes describe the housing-conditions in each settlement visited:—

NORTH ISLAND.

Huntly (1,535).*—The old-established Township of Huntly, in the Waikato district, appears to have developed from year to year without ultimate plan, with the result that the houses and streets have been set out in a very uninteresting and inconvenient manner. There is a great shortage of houses, and a comprehensive building scheme should be undertaken. Rain-water only is available for domestic supply. There are no playgrounds for children, and there is no local hospital. There is a sufficient amount of land held by the Taupiri Company on which to form a model suburb, with all conveniences and suitable environment. Owing to the shortage of houses, there is a good deal of overcrowding. In one case a house of three rooms is occupied by seven people, for which a rental of 8s. per week is paid. (See photograph No. 1 in the Appendix to this report showing cottages owned by the company and let at 5s. per week.)

Rotowaro (32).—This is a newly established mining village near Huntly. Eight houses have been erected by the Taupiri Company on a very suitable site close to the Rotowaro Station and about a mile from the mine, in readiness for occupation by mine workers. The houses are, in Mr. Hurst Seager's opinion, far too expensive, and he advocates the erection of a large number of a cheaper form of construction than those erected by the company. These should be disposed on proper town-planning lines. The old site should be resurveyed so that the houses may be placed in accordance with the contour of the land. It is a very suitable position for a garden village, and if treated in a proper way might be made extremely attractive.

Pukemiro (223; near Huntly).—This is a comparatively new settlement. The site is considered an excellent one by the Board's expert, but it has not been properly treated. A large amount of money has been wasted by the formation of a 66 ft. road where well-kept foot-tracks only are required. The whole village should be replanned, and a proper type of house erected. There are possibilities of making an extremely attractive garden village. There is good soil, ample water-supply, and good drainage. There are 160 men employed at this mine, which is only in its fourth year of output. Ten houses have been erected by the Pukemiro Collieries Company, and the remainder have been provided by the men themselves. Approximately one-half of the miners live at Huntly, as there is not sufficient housing-accommodation at or near the mine. Most of the huts near the mine occupied by the miners should be condemned as unfit for habitation. (See photograph No. 1A in the Appendix to this report showing huts near the mine itself.)

Glen Massey (346).—This mining township is situated about eight miles from Ngauawahia, in the Waikato district. It appeared to the members of the Board to be very suitable for settlement

* The numbers in parentheses give the population as at the census of 1916.

purposes; but the housing is totally inadequate for the needs of the workers, and evidence was tendered to the Board showing that overcrowding exists. In one case a miner, with his wife and five children, are living in a two-roomed cottage, and in another case there are five persons (three children) living in two rooms. At least ten roomy houses are required for immediate needs. The huts provided by the Waipa Company at present have no fireplaces or water-tanks, and both these necessary conveniences should be immediately provided. The company has bought sufficient land near the mine and is prepared to sell sections at from £35 to £40, which is the price it paid for them. The company is also prepared to carry housing-material over the railway free of cost.

SOUTH ISLAND.

Avoca (21).—The mine at Avoca belonging to the Mount Torlesse Collieries Company is situated in the Canterbury District, on the Midland line some seventy miles from Christchurch. No houses have been provided for the miners, but tents are placed in a valley subject to floods, and some in positions with a very meagre supply of sunshine, so that in winter for two months in the year it is impossible to dry any clothes in the open. There is a plateau about two miles from the mine with a gentle slope towards the east on which a properly designed garden village could be formed. Trees would have to be planted to give protection from the north-west and south-west winds. The soil is good, the climate fine and healthy, and excellent gardens could be made. The site is about two miles from the Avoca Station.

The company has made application through the Board for monetary assistance from the Government for the erection of miners' dwellings. The sum of £5,000 has been applied for. As it was necessary that some provision should be made for the workers during the coming winter, the Board made urgent representations to you to consider the request favourably, provided that reports from the mining experts as to the probable value and life of the mine are satisfactory.

Kaitangata (1,681).—This town, four miles from Stirling on the main line between Dunedin and Invercargill, is undoubtedly one of the most favourably situated settlements inhabited by miners. It is in a good farming district, and it was pleasing to note that many of the miners had cultivated gardens and were able to grow their own vegetables. The township is very scattered, but the housing-conditions generally are extremely good. The sections are mostly one-quarter of an acre in extent. The land is all privately owned, but there is a very large number of sections on which more houses could be built. It would be possible to get a clear block of some acres and start a model suburb; but Mr. Hurst Seager considers that, as the village is so well established and so many of the houses owned by the miners, it would be best to improve, as far as possible, the present site and to build houses on the land available as they are required. There is urgent necessity in the village for a good drainage-system and water-supply. (See photographs Nos. 2 to 5 in the Appendix to this report showing—(2) General view of Kaitangata; (3) some of the best homes privately owned; (4) collection of homes on the rising ground; (5) collection of homes on the rising ground towards the mine.)

Nightcaps (607) is situated some forty miles from Invercargill by rail. Mr. Seager did not inspect this locality, but the Board found the conditions much the same as at other mining townships as to overcrowding, lack of sanitary conveniences, and drainage, though the majority of the houses are substantial and stand in ample spaces. Many of the miners have purchased their own homes through a building society. The locality offers every facility for the creation of a pleasant village settlement, with suitable soil for gardens.

Runanga (1,411; eight miles from Greymouth).—In this settlement reside the majority of the miners employed at the State mines. The town compares favourably with others visited, and there did not appear to be much evidence of overcrowding, nor is there a shortage of houses at present; but houses of a better type should be built to take the place of many of the inferior homes which exist. The Government owns seven houses of five rooms and scullery, which are let for 8s. per week. They cost £300 in 1910. These houses have three bedrooms (12 ft. by 12 ft., 12 ft. by 10 ft., and 12 ft. by 9 ft.), a living-room (16 ft. by 12 ft.), and a scullery (12 ft. by 9 ft.). The scullery is fitted with bath, copper, two wash-tubs, and sink. These are satisfactory homes. There is only tank-water available for domestic use, and the present drainage-system is unsatisfactory. A main open drain runs down the principal street, which, it is alleged, becomes offensive in the summer. With the provision of a better water-supply and drainage-system this township could be made one of the most desirable of mining villages. (See photographs Nos. 6 to 8 in the Appendix to this report showing—(6) General view of Runanga, showing privately owned homes and Masonic Hall; (7) one of the Government houses beautifully kept; (8) Dunollie, looking towards the mine.)

Blackball (863) is situated some twenty miles north of Greymouth, a few miles from the main line to Reefton. Much requires to be done here to put housing-conditions on a satisfactory basis. Mr. Hurst Seager considers that the place should be resurveyed in order to convert it into an attractive village. Although there is at present a number of empty houses, there are few indeed fit for occupation. Houses of four rooms are let at from 7s. to 12s. per week. There is no drainage, only rain-water pans, but no system of emptying, and in some cases there are cesspits. The miners consider that the houses generally are not fit for habitation. The housing is certainly extremely bad, and the huts which were put up by the Blackball Company, and for which they charge 2s. 6d. per week, are very unsatisfactory. The huts are placed in a row. The windows are fixed so that they cannot be opened, and the door has to be left ajar to admit air. (See photographs in the Appendix to this report showing—(9) Miners' homes, 11 ft. 6 in. by 9 ft. 6 in., owned by the company and let for 2s. 6d. per week; (10) one of the houses—the windows are fixed, and the occupant, to get air and protection from the weather when the door is open, has taken out a pane of glass and put

a rough piece of iron over the doorway; (11 and 12) two of the better class of miners' huts at Blackball.)

Roa (45) is situated a few miles from Blackball. All the houses are owned by the Paparoa Company. Complaint was made by the workers that they are often overcrowded—two or three men occupying a hut with accommodation fit for one man only—and that the water-supply and drainage-system are bad. More houses are required for married workers. The company claims that it is willing to do all possible to supply the miners with proper homes, but had been greatly handicapped owing to the dearth of labour.

The huts built by this company compare very favourably indeed with the huts erected at Blackball, as the windows are made to open, and the huts are provided with tanks, cupboards, and brick fireplaces. The rent of 1s. a week is very reasonable.

Mr. Hurst Seager considers that Roa should be regarded as a suburb of Blackball, and should be developed on garden-suburb lines.

Reefton (1,523).—Large adjacent areas have been taken up as coal-mining fields a few miles from Reefton, and here undoubtedly a small garden city should at once be planned and carried out as necessity demands.

Waimangaroa (287) is seven miles north of Westport by rail, and is situated at the foot of the ranges upon which Denniston is built. Its value as a mining township is heavily discounted by the long and difficult route to the nearest mines, though there is a supply of suitable land to extend the township if required. The houses generally are very good and, despite the long travelling-distance, are occupied mostly by miners.

Denniston (702) is situated upon a hilltop, and is reached by rail journey of ten miles from Westport to Waimangaroa, and from the latter place by motor vehicle over a well-formed road, which winds up and up for seven miles to a height of 2,000 ft. The fare from Westport to Denniston and Burnett's Face beyond averages about 15s. for the return trip. Mr. Hurst Seager considers that the present positions of the houses both at Denniston itself and at Burnett's Face are unsuitable, whilst the houses generally are extremely bad. It would be better to disregard these and to form a model village on the plateau which lies half a mile from Denniston towards Burnett's Face (526). The opinion expressed by the managers and union representatives is that this position would be quite satisfactory. It is a rocky knoll, and there would be but little chance of any growth; but, as the trolley-way for the coal passes right over this plateau, it would be a more or less easy matter to bring up enough soil to make a small patch of garden for each house. The houses should be built of concrete, as the sandstone on the spot could be easily broken up with a stone-crusher to form the matrix, or an experiment might be made to use the stone itself to build the houses; but without further examination Mr. Seager cannot state whether the stone would be sufficiently durable, though it would certainly be quite suitable for use as broken metal for concrete.

There are at present at Waimangaroa, Denniston, and Burnett's Face 374 houses and a population of about 1,500 people. If the village was planned for, say, 200 houses on the plateau at Denniston and 100 of these were erected at once the conditions of housing should then be satisfactory. (See photographs in the Appendix to this report showing (13) Plateau between Denniston and Burnett's Face on which it is suggested a township should be formed; (14) general view of Denniston; (15) some of the cottages erected by the mining company and sold to the workmen; (16 and 17) collection of huts and shacks on the western face of Denniston Hill; (18) road above the western face leading towards the plateau; (19) camp to the north of Denniston; (20) looking down on the camp; (21) nearer view of the western face seen in general view No. 14; (22) general view of Burnett's Face; (23) collection of huts and houses at Burnett's Face; (24) typical hut at Burnett's Face; (25) Burnett's Face—some of the homes.)

Granity (667) and *Millerton* (843).—Granity is seventeen miles north of Westport by rail. Like Waimangaroa, it is situated on the sea-coast, and Millerton lies on the hilltop three miles away and 2,000 ft. up. There is no further land available for housing at Granity, but at Millerton, which is favourably situated, an attractive township could be formed. (See photographs in the Appendix to this report showing (26) Bird's-eye view of Millerton; (27) house at the side of incline, Millerton.)

Ngakawau (157).—This village is beyond Granity and about twenty miles by rail from Westport. Several Stockton miners reside here, though they have to spend about two hours in travelling to their working-places. It would be far better, in the Board's view, if a township could be formed on the hill at Stockton (101), where a few houses have already been built by the company. A road is being formed from Stockton to Millerton on the Westport Company's lease, so that there may be easy access from Granity to Stockton. As the Stockton mines are connected with Stockton village by an electric tram, it would be an easy matter for the miners to be carried to and from their work to the village. This village at Stockton should be properly planned for about a hundred houses, which should be erected as required. The population of Stockton is now about one hundred and fifty. The Westport-Stockton Company has built six four-roomed and two three-roomed houses of a good type. Mr. Seager considers that there is a suitable place at Stockton for forming a model township, including a perfectly flat basin of about 4 acres, which is being reserved as a recreation-ground. There is ample room for many houses on this spot and also on the slightly rounded formation a few chains distant. The houses erected by the company are being sold to the miners, who are paying off the capital cost at the rate of 10s. per week. (See photographs in the Appendix to this report showing—(28) Homes erected by the company at Stockton, costing £205 each; (29) well-kept home at Stockton; (30) general view of Stockton.)

2. GENERAL REMARKS ON HOUSING.

In many of the mining settlements the housing is generally of a rough or temporary nature. Many of the huts were erected in the early days of settlement, and still do duty as the homes for the mine worker and his family. In many cases no ordinary conveniences have been added, nor have any extra rooms been built, so that overcrowding is rife. The great majority of the houses have no porches or verandas, consequently the children have to crowd into these small shacks in wet weather. It need hardly be emphasized that the climatic conditions in most of the coal-mine districts are not good, and on the West Coast, where the rainfall averages over 100 in. per year, there is every need for the dwellings to be roomy and bright, and to provide ample drying-facilities for the miner's clothes. Apart from overcrowding, there are the added evils of lack of drainage, lack of sanitation and means of bathing. At Burnett's Face and Denniston (near Westport) the housing-conditions are generally deplorable. Both townships are in a disgracefully dirty state; the surface drainage is extremely bad; there are no fences or privacy; and there are no baths in any of the houses—the occupants using kerosene-tins and tubs. There are few trees, and no flowers or gardens to brighten the general dreariness and desolation, and to these drawbacks are added all the disadvantages of a wet, cold, and foggy climate. So unsuitable are the conditions at present that the Board strongly recommends the adoption of a suggestion made by Mr. Hurst Seager that a new village settlement should be built on the plateau which lies between Denniston and Burnett's Face. This spot is half a mile nearer the works than Denniston, and there is ample space for laying out a model township with proper water-supply and drainage.

The causes which have led to the present conditions of housing in the mining settlements are bound up with the haphazard way in which the villages have grown up, a method far too common in respect of all New Zealand towns. The towns were not pre-planned by a competent authority, nor was due consideration given to local conditions. Plans of some of the townships were prepared, streets and sections marked out in the legal rectangular manner, and it has often been found on application of these plans to the site that it is impossible either to form roads or to build on many of the sections shown. Indeed, many of the sections on the original plan are quite unfit for building purposes. Some are swampy, and others are on steep and rocky mountain-sides along which the whole of the drainage of the land and the household slops of the sections above fall to the sections below.

In one case the only available sites for houses were on the site marked for a road, and consequently houses have been built there, and the absolutely necessary tracks and roadways have had to be formed over private property.

No thought has been spent on the aspect or prospect of the houses. Had proper consideration been given to the contour and steepness of the land and the possibility of erecting healthy homes on the sites selected, much of the present inconvenience and insanitary conditions would not have arisen.

Generally there has been little thought for the health, convenience, or comfort of the workers who are called upon to live on the sites marked out. The hopelessness of the attempt to make comfortable homes under the conditions provided tends to create callousness and an utter disregard for the amenities of life, and to acceptance of conditions of housing similar to those found in the Old World only as the result of extreme poverty.

There is considerable discontent with the conditions which exist, and there is an earnest desire on all sides to have them bettered. One aspect of the problem is presented by instances coming under our notice where the miner and his wife and a large family are living in two or three rooms and are perfectly contented. In one "shack" of two rooms there are father and mother and seven children. The father, on being questioned, said he did not wish for anything better. In cases of this kind it is necessary to protect the workers from themselves in order that the children may be brought up in proper living-conditions.

OWNERSHIP AND RENTS.

The houses may be divided into various classes:—

(a.) The fairly convenient four- and five-roomed houses which have been erected by the companies and sold to the miners, who repay the purchase-money and interest in fortnightly instalments. The exact terms of repayment of these vary; in some cases some pay £1 per fortnight, plus the interest on the expenditure at 5 per cent., the interest being reducible every six months; in other cases one definite payment covers the interest and reductions of capital on the ordinary building-society scale.

(b.) There are houses erected by the miners themselves on land which they have purchased from the company. In some cases there was no other land available than that which the company offered for sale. Some of the houses erected on these sections are fairly convenient and sanitary, but in many cases the houses are not by any means what they should be.

(c.) The owners of the houses erected under the above two systems have often let them to incoming miners. The houses are often in a dilapidated state because the owners will do nothing to keep them in repair, and the tenants appear to be prepared to put up with all sorts of inconveniences rather than spend any money upon them.

(d.) Houses which have been bought by subsequent purchasers from the original owners. It is only in exceptional circumstances that the original owner gets a proper return for the money which he has expended. In the greater number of instances he is fortunate if he can sell his interest in the property for one-half of what it has cost him. If, for example, he has paid off £100 he may sell his right in the property for £50, and it is the risk of this prospective loss which deters many of the miners from creating decent homes or entering upon the responsibility of ownership.

The great majority of witnesses examined urged that the miner should not be placed in the position of tenant under the mining company. There is certainly a great deal of discontent arising from the present haphazard system, but there is no general wish to get decent homes without proper payment of rent. The men realize that the homes should be built simply and comfortably with modern conveniences, and that the rent should be a fair interest on the capital expended.

The *rents of the houses* appear to vary greatly according to locality. Compared generally with the rents paid by workers in the cities they are considerably cheaper. For four- or five-roomed houses, devoid of bathrooms and ordinary sanitary conveniences, the rents range from 6s. to 10s. per week, the predominant rent being 8s.; three-roomed houses range from 5s. to 8s. per week, the predominant rent being 6s.; while the larger houses of six rooms range from 10s. to 12s. per week, the predominant rent being 10s. 6d. Huts built by the companies for single men, and accommodating two, range from 1s. to 3s. per week. Houses appear to be cheaper, as well as of better quality, at Kaitangata than in any of the other townships visited, the average for a three-roomed house being 5s. 6d., for a four-roomed house 6s., for a five-roomed house 9s. 3d., and for a six-roomed house 10s.

3. ACCOMMODATION FOR SINGLE MEN.

With regard to the accommodation available for single men, complaints were made as to the increased cost of living during the war period as compared with pre-war days. The rates paid for full board and lodging during such periods in typical mining localities were as follows:—

Locality.	1913.	1918.
Huntly, Waikato	18s. to 20s.	25s.
Kaitangata	20s.	22s. 6d. to 25s.
Nightcaps	22s. 6d.	27s. 6d.
Paparoa	18s.	27s. 6d.
Blackball	17s. 6d. to 20s.	25s. to 27s. 6d.
Denniston	22s. 6d.	25s. to 27s. 6d.
Millerton	20s.	27s. 6d. to 30s.

Men provided with huts pay for this accommodation from 1s. to 3s. per week, and for their meals generally from 20s. to 22s. 6d. per week. The accommodation provided appeared to be fair, and the meals wholesome. At Mangatini, an isolated spot beyond Millerton, the boardinghouse is run under the auspices of the mining company, and accommodates a large number of men. All the food and supplies are carted over the company's trolley-line free of charge, and electric lighting and coal are provided for a nominal sum by the company. The service and conditions generally in this accommodation-house are commendable, despite the isolation.

4. GENERAL SOCIAL WELFARE.

In addition to the complaints concerning housing-conditions, the mine workers brought before the Board matters concerning their general social and economic welfare. In the Waikato, Nightcaps, and Millerton districts the miners stated they were greatly handicapped by—(a) Lack of doctors and qualified nurses; (b) lack of maternity homes; (c) long distance from the mining townships to the nearest available hospitals; (d) the high cost of medical and nursing attention and high fees payable to hospitals; (e) lack of higher educational facilities for their children. The lack of doctors is due to war conditions, and will no doubt be remedied shortly now that hostilities have ceased. *The question of location of hospitals* is a difficult one, but the Board inclines to the view of one of the medical men who gave evidence that *the needs could be best satisfied by providing a motor-ambulance in each mining village and small cottage hospitals for maternity cases, together with an additional bed or two to meet emergency accident cases as they arise.*

In respect to education, *the mine workers stressed the need of some assistance to enable their children to attend secondary and technical schools.* Invariably these schools are situated in the larger towns some considerable distance from the mines, as, for instance, at Hamilton (twenty-one miles from Huntly, twenty-nine miles from Pukemiro, and eighteen miles from Glen Massey), at Riverton (fifteen miles from Nightcaps), at Westport (fifteen miles from Denniston, twenty miles from Millerton, and twenty-three miles from Stockton). In cases of children obtaining scholarships the allowances, it was claimed, should be increased so as to ease the burden on the parents of having to pay a large portion of the board and lodging fees.

Another complaint referred to was the rates ruling for weekly fares on the local railways. Owing to lack of housing and other social facilities many miners employed at the Rotowaro and Pukemiro Mines reside at Huntly, distant six and eight miles respectively, and they complain as to the fare to be paid weekly—viz., 3s. 6d. to Rotowaro return, and 4s. 6d. to Pukemiro return—and ask that they should be given the benefit of the workers' weekly tickets issued in the suburban areas. The Railway Department considers that it cannot give any concession beyond the present one, which means a cost of 4½d. per trip as against 11d. ordinary fare, and that the suburban-area concession cannot be applied to places where there is no population to necessitate the creation of suburbs outside a congested area, since it is essentially a concession granted to the large number of workers in the main centres of population, to encourage them to live outside the cities in order to cheapen rents and provide the healthiest conditions for themselves and families.

NOTE.—Some of the social disadvantages of life on the coal-mining fields have already been discussed in Chapter I, section 5 (vii) and (viii), p. 20, and Chapter V, section 5 (iv) and (v), p. 70, which should be read with this chapter.

CHAPTER VIII.

RECOMMENDATIONS AND CHIEF FINDINGS.

1. INTRODUCTION.

THE coal-mining industry of New Zealand cannot be said to have exploited the public during the period of the war. Though the supplies of coal have not been as regular and uninterrupted as should have been the case with less industrial friction, neither the owners of the mines, nor those actively engaged in the management and direction of the industry, nor the workers in the mines, nor those engaged in distribution have received remuneration that should be regarded as unduly high in existing conditions. It is an industry which experience shows to be one of very uncertain return, of varying cost, and with labour conditions that do not appeal strongly to the ordinary worker. The markets are small and widely scattered, and there is considerable waste in production due to the great amount of small coal necessarily produced with the larger, for which in normal times there is little or no demand at a profitable price. The experience of the past is not very encouraging for the future. The conditions directly and indirectly governing the industry are such that there is not much scope for effecting any considerable fall in the price of household coal relative to the price of other commodities in common demand. But unless certain improvements are made, particularly in the organization of this industry, the relative price of coal will continue to rise, and probably rise rapidly. The means of establishing the permanent conditions necessary to prevent or minimize such a rise have received our chief attention. The main recommendations to this end are set out below in sections 2 and 3

2. IMPROVEMENTS IN THE PRODUCTION OF COAL.

Those lines of improvements promising to lead to the fullest results suggested by the evidence gathered and by the examination of the conditions of the mining industry by the Board itself lie in the direction of a more efficient organization of the industry than of any immediate reforms in the technical details of the mining processes. The latter would follow as required in consequence of the broad changes contemplated in the organization, their need being then more clearly apprehended and their institution more easily effected by a body charged with the direction of the industry for the whole of the Dominion, able to command the most expert advisers and possessed of the necessary financial power. With certain exceptions mentioned below the technique of coal-mining in New Zealand is considered by competent authorities to be, relative to the peculiar local conditions, as well planned and carried out as in any other coal-mining region. Among the chief disabilities under which the individual mines labour are the stoppages of work and disturbance of good feeling through industrial unrest, the waste of resources due to a lack of markets (in some cases a permanent lack) for part of their output, and the difficulty of providing such a social environment as will permanently attract a good class of worker. These are only a few among many factors which, influencing the mines directly, have also a peculiar interest for the community as a whole, since it needs a steady supply of coal at a reasonable price and readily adaptable to changes in demand.

In view of this undoubtedly strong national interest in the coal-supply the Board devoted considerable thought to the question of the desirability and practicability of "nationalizing" the mines of New Zealand. "Nationalizing" may be interpreted in several senses. The Government of the Dominion might

- (i.) Buy the mines outright; and, having done so, might—
 - (a.) Either work them itself, as it does the present State mines; or
 - (b.) Lease them to concessionaries under strict conditions; or
- (ii.) It might institute some form of control of the privately owned mines through a public Department charged with the enactment and administration of regulations binding the industry; or
- (iii.) It might obtain representation on the directorates of the chief mines by legislative right or by virtue of financial grants for developmental purposes.

All these forms of reorganization may be regarded as varieties of "nationalization." The questions we set ourselves to answer are—

- (1.) Is nationalization desirable; and
- (2.) If so, which particular form of nationalization promises the best results for the coal industry in New Zealand?
- (3.) If not, what modifications, if any, are required so that the industry may best serve the community during the remainder of its term?

The Board, after carefully considering all relevant arguments, is of opinion that some form of nationalization is urgently needed as an essential step towards removing shortcomings of long standing, effecting needed improvements of a positive kind, and avoiding evils that threaten to turn the industry out of the course of healthy and sane development.

The chief aims to be achieved by reorganization of the industry appear to be these :—

- (1.) The introduction of economies in the cost of producing the output of coal.
- (2.) The conservation of the coal resources of the Dominion, with due regard to the most equitable distribution of the available supplies as between present and future needs ; the systematic and easy development and expansion of the industry to satisfy the growing requirements of the community.
- (3.) The concentration of the industry at any given time in the most profitable fields.
- (4.) The removal of the causes of labour unrest. Subsidiary to this is the institution of proper housing for mine workers.
- (5.) The inauguration of an efficient system of distribution.
- (6.) The regulation of coal-prices in the interests of consumers.

A change in organization in the direction of consolidating the several mines of the Dominion under a single central control and management would tend to effect many economies in the costs both of production and marketing, as well as to facilitate the development of a well-reasoned compact policy for the whole country in regard to the opening-up of new fields, the closing-down of unprofitable mines, and the application of the capital and labour resources to those mines at which the supply of coal required could be most economically won. Such a change would also provide those conditions which seem to promise the most useful results in the distribution of coal by extending to that sphere, in which reforms of other kinds appear to be so difficult to make because of our scattered markets, our small population, and widely diffused mines, the principle of unified and co-ordinated policy and management. The most satisfactory methods of distribution and the lowest prices are found at present in those cases where distribution is controlled by the same agency as production—for example, in the case of the Westport, State, and Pukemiro coals. The elimination of labour unrest and the control of prices in the public interest could both be facilitated by such a change, since it would provide an opportunity for giving that direct representation of labour and consumers on the agents controlling production that promises to be one of the most powerful factors in harmonizing economic classes.

But the Board is of opinion that this desired change should not take the form of State purchase and direct management of the mines. It believes that direct State ownership and management, though it might lead to some of the objects in view, would not foster the highest degree of enterprise, initiative, and resourceful management, nor the necessary single-minded regard for efficient service from all ranks, nor the accumulation out of the profits of the industry of the fund adequate to its future development without becoming a burden on the other industries of the Dominion. The most pressing need is to combine the undoubted advantages of centralized policy and management with those that may reasonably be expected to result from representation of labour and of consumers (through the State) on the controlling body.

The Board therefore strongly urges the immediate institution of a Dominion Coal Board (for development and conservation).

The Dominion Coal Board should consist of representatives of—

- (1.) The existing coal-mining companies ;
- (2.) The employees of these companies ; and
- (3.) The Crown.

It is suggested that the Board comprise five members at most—the companies to appoint two members, the coal-workers two, and the Crown one, who shall be president. If the Board took over the function of distribution the employees engaged in that branch would exercise a voice in the selection of the representatives of labour on the Board. The nominee of the Crown should be appointed for a definite term. The representatives of the coal companies should be elected by the shareholders voting by a method similar to that prescribed for the election of the directors of a company under the Companies Act. The representatives of the coal-workers should be elected annually according to a system to be determined after consultation with the workers. In order to establish some continuity in policy the members of the Board should retire from office not as a whole, but one representative of each of the two interests of capital and labour at a time ; this would involve a two-years term of office for each representative, but he should be eligible for re-election.

The Dominion Coal Board should be in a position to achieve effectively the objects detailed above on this page and similar aims. *To these ends the Board should be empowered to take over the existing coal companies with their assets and liabilities at valuation, and to issue stock to the existing shareholders in exchange for the shares held by them at the average market value of such shares for the period of the three years immediately preceding such exchange ; such average market value to be calculated and determined by a specially appointed Commission.*

Existing company law should apply to the Dominion Coal Board, but it should be modified wherever required to permit the Board to exercise the functions necessary to achieve the objects in view.

Stockholders should be guaranteed a pure interest rate of 4 per cent. on their paid-up capital. From the balance left, after payment of this rate, working and maintenance expenses, and making provision for renewals and depreciation and reasonable development, there should be paid—

- (1.) A risk rate to stockholders, and
- (2.) Bonuses to stockholders and employees in the proportions respectively of the amount of dividend calculated at the pure interest and risk rates combined and the total amount of the pay roll of the Board

The Board should also take over, administer, and develop the existing coal-mines of the State. The industry should be subject to taxation and rating in common with all other industries.

The Board would probably find it advantageous to organize its business on an extension of the lines followed at present by the Westport Coal Company, which administers its affairs through a general manager, who is assisted in respect of production by a district manager in charge of all the mines on the field, with several mine-managers subordinate, and, in respect of marketing and distribution, by a sales manager and branch managers in the different consuming centres. It should consider the advisability of owning and running steamers for the transport of coal.

Among the subjects to which the Board should give attention at the earliest moment are the following, which came prominently under our notice as affecting the production of coal:—

(1.) Reference of the methods of mining to be followed in new mines to a committee representative of the best experience and theoretical knowledge, so as to avoid certain present dangers and costly hindrances to production that have followed upon the adoption of unsuitable methods without due consideration.

(2.) The provision of suitable housing-accommodation at the mining-fields. We strongly recommend that the Coal Board be empowered to impose a levy of 3d. per ton on all coal raised in the Dominion, to be supplemented by a duty of 3d. per ton on all imported coal, for the purpose of providing interest and sinking-fund charges for loans to build houses and provide suitable means of recreation for mine workers on recognized town-planning lines. We are satisfied that the value and probable duration of the industry warrant this step being taken on most of the fields, and that the fund so provided would prove sufficient for the purpose.

Its cost we consider to be a fair charge to be borne by the industry itself. The scheme should be worked out forthwith in detail, and inaugurated at places like Avoca and Denniston, to quote two cases—one typical of new mines, the other of long-established collieries with a long life ahead. (See Chapter VII, p. 81.) The miners should be encouraged to form in each centre a housing committee to see that the houses and gardens are kept in proper order and to advise the Board of the needs of the district.

(3.) The institution of an easy means of transporting miners from their homes to within reasonable distance from their working-faces. This is necessarily bound up with the question of the location of any new mining settlements under (2). (See Chapter I and Chapter V, pp. 21 and 73.) Closely related to this is the duty of arranging with the Railway Department for a better train service between the workers' homes and the mines. It was asserted, for example, that at Rotowaro and Pukemiro the coal-output could be increased by 4,000 tons per year if so much of the men's time were not wasted by an inefficient train service. There appears to be need of improvement even in the railway-line serving the State mines at Dunollie and Rewanui in respect of suiting the convenience of the mine workers, as well as on the Blackball line.

(4.) The establishment wherever needed—for example, at Huntly—of a motor-ambulance depot with a small dispensary, and a maternity hospital with a bed or two for emergency purposes, and any similar appropriate facilities for dealing with accidents and providing medical attention and comforts for the remoter mining camps.

(5.) The desirability of introducing certain improvements in the technical processes of mining the coal, more particularly coal-cutting machines (see Chapter I, p. 20), double-decked cages as used in Australia (for Huntly), the system of flushing the mines with sand in order to allow of the mining of the maximum amount of coal on the fields.

(6.) The transfer of the management of those railways which serve coal-mines only, such as the Greymouth - Point Elizabeth and Westport-Mokihinui lines, to the Coal Board. A certain amount of inconvenience and friction is caused by the fact that the mines have no direct control over these railways.

(7.) The modification of certain parts of the Coal-mines Act. We do not feel justified in advising any alteration in the following particulars concerning which representations were made to us. They require consideration by experts in mining itself, and should receive the attention of the proposed Board.

- (i.) Giving miners the power, at the discretion of the Mining Inspector, of firing their own shots in certain conditions—*e.g.*, in wet places.
- (ii.) The abolition of the provision limiting the number of men employed in a ventilated district to fifty.
- (iii.) The reduction of the time a miner must spend underground before he may be put in charge of a face. We do not think a *prima facie* case has been made out for this demand.
- (iv.) The placing of two names on the board at the mine-mouth—that of the general manager as well as that of the mine-manager—so that in a case of disaster both may be held responsible.

(8.) The urgent need of improving the coal ports. The further development of the harbours giving outlet to the West Coast mines is a matter of vital importance to the coal trade of the Dominion. Upon this depends not only the regularity of the supply of bituminous large coal in the centres of the Dominion, but the possibility of a profitable export trade in the smaller coals of the districts and the cheapness of that part of the supply marketed here; for if a steady foreign market can be developed for the bunker coals the other part of the output can be sold at a lower price. We direct particular attention to the extract from the evidence tendered to us by Mr. C. N. Boulton, Engineer to the Westport Harbour Board, printed in Appendix A, in which he recommends certain improvements as absolutely necessary in his opinion to make Westport Harbour adequate to the needs of the coal trade.

(9.) The thorough prospecting of fields whose development promises profitable results in the near future. We have in mind in particular the deposits of the Inangahua, Reefton, and Waikato fields, as our examination of the districts and samples of coal obtained convinced us that there is a strong case for instituting a thorough and systematic testing of these fields.

A feature of the reorganization recommended by us is the *introduction of the mine workers to a voice in the determination of the business policy of the industry and in the conduct of the management*. We believe that this is the way which promises most for the alleviation of industrial strife and misunderstandings between capital and labour or employer and worker. That the present relationship cannot last and is destined to a rapid change must be the opinion of every one who studies the fundamental facts of the situation without bias. Strong forces are at work that cannot be ignored or altogether counteracted, even if it were desirable to do so; but they may be controlled and guided so as to effect results that shall be truly constructive and socially beneficial. Unless the period of transition be eased by conscious co-operative effort on the part of the workers, employers, and the community generally towards the realization of a higher and more humane form of business organization, it may end in the cataclysm desired by none but a few revolutionary fanatics or Utopian dreamers. The best means of establishing better industrial relations is that which shall satisfy the natural demands of the workers to share in the conduct of the business in which they are engaged. It appears to us that the coal-mining industry is one in which such participation may be established. The formation of a Dominion Coal Board would naturally be followed by the institution of works committees or joint pits committees as well as by joint district committees or councils. It would then be no more difficult than it is at present to fix responsibility for the safety of the mines upon a particular individual or group. The industry is one that possesses little in the nature of trade secrets; it has developed a large body of experience that is the common property of those engaged in it; and it has much to gain from that full and frank discussion by all parties of the details of costs and returns which would be possible were all the mines under one management and ownership.

Certain matters brought before our notice regarding labour organization should receive the attention of the Board. Part of the expenses of the "*check inspection*" of the mines should in our opinion be borne by it, and the vexed question of *contract or wage trucking* could be threshed out by the representatives. The provision of the *Workers' Compensation Act* whereby a mine worker must be absent from work for a period of fourteen days before he can claim compensation requires amendment, since it has the undoubted effect of increasing unnecessarily the time off following an injury.

3. IMPROVEMENTS IN THE DISTRIBUTION OF COAL.

The organization of distribution is generally much more faulty and defective than that of production. Its shortcomings have been indicated in Chapter III. Improvements suggested in evidence at Auckland have been discussed on page 42. Those suggested at Wellington refer mainly to details in delivery at the wharf or storage near-by. The State mines should have a depot nearer the ship. The system instituted by the Coal Trade Committee for economizing the time formerly wasted through crowding of the dealers' drays at the wharf should be continued. If there were means of bagging coal at the wharf costs could be reduced. The establishment of a main depot into which coal could be trucked, it was stated by one witness, might save about 3s. a ton. If coal were sent away unscreened from the mine there would be less breakage.

At Christchurch and Dunedin the excessive number of men engaged in coal-dealing, and the overlapping of deliveries, which are features of the distribution of coal in all the centres, were condemned. The effect of these, and of the trade convention that the small dealer must be given a fair chance in fixing the association price scale, undoubtedly tends to keep the costs higher than they would otherwise be. The establishment of a monopoly in distribution was advocated by witnesses here and in other centres. At Dunedin the general trend of the evidence in regard to the methods of delivery was that it is altogether wrong, and that it should be systematized in the direction of restricting the operation of a given dealer to a particular district. The opinion was expressed that there are too many dealers, that the cash system should be extended at the expense of the credit system, that householders in erecting houses should give greater attention to the provision of coal-cellar, that orders for coal should be given a few days before fulfilment is required, and that if all coal were State-owned there would be a more continuous supply, a greater possibility of a cash trade, and consumers would be more willing to give reasonable notice of their requirements. Certain complaints were made against the Railway Department:—

- (1.) The coal is delayed unduly on the line between the mines and Dunedin, causing great inconvenience to the dealers and extra cost in the form of demurrage.
- (2.) There is a loss of time at the railway-station in taking delivery of coal owing to the fact that expressmen and other small dealers can call early and thus hold up delivery to the larger dealers, keeping their drays and men idle for a considerable part of the day.
- (3.) Every truck of lignite coal is charged up by the Railway Department as 6 tons in weight, though it may be below.

The replies of the Railway Department to these and similar complaints made elsewhere are set out in Appendix B, 4 and 5.

In regard to the methods of handling coal *en route* there was difference of opinion among the large importers as to the advantage of mechanical discharge from the ship, some thinking that there is

not sufficient trade to return the cost of the appliances. One witness estimated that hopper wagons would save 1s. a ton plus the savings in broken coal, and that grabs for discharging would save 9d. a ton. The use of grabs was generally advocated. Some witnesses urged the establishment of bins at the coal ports in which to store small and bunker coal to be delivered mechanically into the steamers, in order to enable the mines to keep working when the bars are bad. But storing in bins is generally not regarded with favour, as it means increased handling and breaking of the coal, which is very friable. The loading of the coal into the ships at Greymouth and Westport is up to date, as it is done by means of hopper wagons swung over the holds.

In order to secure the general application of the advantages that result from large-scale distributing businesses, the abolition of overlapping in deliveries, the concentration of depots, and the ownership by the mine of the means of transport to the main distributing-centres, the Board recommends that the Dominion Coal Board be empowered to undertake the business of distributing coal, including its carriage by sea. This function it might exercise wherever it seemed desirable in conjunction with municipalities and other local authorities, and wherever power to do this is not possessed by these bodies the necessary authority should be granted them by Parliament. The question of the installation of improved mechanical means of handling coal in transit from mines to depots should be decided by the Coal Board after consultation with engineers who have made exhaustive inquiries into this subject.

4. PRICES.

If the recommendations made above be adopted they should result in the lowering of the price of coal relatively to that of other commodities. There should be on the supply side (i) lower costs of production, marketing, and distribution generally because of the economies from unified control and the larger scale of business; (ii) a more regular output; (iii) a more even quality of coal; and (iv) the probability of marketing a larger proportion of the small coal than is now possible, tending to lower the price of house coal relatively to the prices for the rest of the output.

But demand also exercises its own peculiar influence on price (see Chapter I, section 7 (vi)), and *there are certain ways in which demand should be modified and which should result in a lower price for coal.* In regard to household coal the chief points to be noticed are—

- (i.) Householders should notify their orders for coal some considerable time before delivery is required. This would facilitate the systematizing of deliveries over different area blocks, making it easier to confine the several dealers to special areas. This would very appreciably affect the cost of delivery per ton.
- (ii.) Coal-bins should be provided by householders wherever possible in convenient places. These would reduce delivery costs by economizing the time and labour in delivery and diminishing the number of sacks required and lengthening the life of those used.
- (iii.) If unscreened coal were more generally used for household purposes the coal bill would be smaller. If all household coal were sent unscreened from the mines there would be less breakage and less waste of small coal, enabling it to be sold at a lower price. There is much room for improvement in the prevalent methods of stoking domestic ranges and grates, which do not utilize to the full the heating-qualities of slack and brown coals. Costly screened bituminous coal is used in ranges and grates, and often largely wasted through unskilful stoking, where brown coals or a judicious mixture of brown and bituminous with the use of slack and coke would yield as good results with much less cost. Greater attention should be given to systematic instruction in domestic stoking at technical schools and cookery centres.
- (iv.) The increased use of gas and electric heating, substituting an indirect for the direct demand for coal, and freeing more of the supply for industrial uses.

The demand for coal for industrial purposes may be very considerably modified by the increased use of mechanical stokers, some varieties of which are now used in the Dominion with great advantage; by other improvements in furnaces; by the use of dust-firing and by the extension of suction-gas manufacture, as well as by the establishment of plants for the manufacture of electric power on the coalfields. There is urgent need for research in these directions; and the Coal Board, or, failing its institution, the Government, *is recommended to encourage and financially assist experimental work which has in view the utilization of that part of the coal-supply which is at present largely wasted, particularly the slack or fine coal.*

So far we have considered the price of coal relatively to that of other commodities. Its price, however, may change in common with the prices of other commodities in general, owing to changes in currency conditions, and independently of changes in the conditions of the supply of and demand for coal itself. There is no doubt but that *part of the rise in the price of coal during the last five years has been due to the inflation of currency and credit* (see the Second Annual Report of the Board of Trade, 1918, pp. 17–18, H.—44). “Every creation by the Government or by the public of fresh credits means an addition to the purchasing-power and therefore an increase of prices. It is only when credits are redeemed by an equivalent in saving or in extra production that their effects upon prices are cancelled.” *The subsequent trend of coal-prices will therefore depend in some degree upon the financial policy of the Government and banks and other financial houses.* If money and credit continue to be inflated beyond the available supply of goods and services any tendency to a lower level of the price of coal will to that extent be counteracted by the effects of such inflation. On the other hand, *a wise policy of*

tending for legitimate productive purposes and of encouraging saving for investment will tend to accelerate the effect of all other forces making for a fall in the price of coal.

The Board of Trade, whilst recommending the institution of a Dominion Coal Board and unity of administration into the coal industry, is alive to the necessity of preserving as far as possible the principle of competition as a regulator of price. *It would therefore view with disfavour any attempt to discourage the importation of foreign coals or to discriminate against their use.* The Coal Board should direct all its efforts to improving the efficiency of the industry at every point by keeping the capital, labour, and management at the highest degree of efficiency. *In particular it should encourage and assist scientific and experimental work designed to that end,* and should take steps to apply to New Zealand wherever suitable the advances in mining-methods that are made abroad. It should be able to devise a system of healthy regulated competition among its mines. The temptation to raise prices against consumers, which besets all monopolies, complete or partial, especially where there is an understanding between capital and labour, should be safeguarded through the representation of the State upon the Board and by the periodical publication of the main facts of the industry in open reports to Parliament.

5. COST OF LIVING—MINING STATISTICS.

The Board recommends that it be authorized, with the assistance of the Government Statistician, to carry out an investigation into the cost of living and the general social conditions of the mine workers of the Dominion on the lines indicated in section 1 of Chapter VI, page 77.

It is also of opinion that the Coal Board *should devise a system of recording costs,* output, amount and character of labour employed, time worked, output per shift, &c., *as far as possible uniform for the mines of the Dominion,* so as to make it possible to institute those statistical comparisons which are necessary for measuring the changes in the industry.

In view of the close connection between occupation, health, and mortality, it is of the greatest importance that living workers be periodically examined in order to obtain accurate records of the diseases from which they suffer.

6. THE MAIN FINDINGS IN RELATION TO THE HEADS OF THE ORDER OF REFERENCE.

It remains to indicate the main findings and recommendations of this report in connection with the different heads of the order of reference.

REFERENCE NO. 1.—THE PRESENT COST OF THE PRODUCTION AND DISTRIBUTION OF COAL IN NEW ZEALAND.

(i.) The cost of production is analysed in Chapter II, pages 24–31, and the chief data summarized in Tables 16 to 24.

The average cost of production at the mines of coal from all the principal collieries of the Dominion for the year 1917–18, taking into account the different outputs of the several mines, was approximately 15s. 4d. per ton. This does not include the cost of railway haulage from the mine to port of shipment in the case of those mines (on the West Coast and in North Auckland) which reckon this cost in when fixing their selling-prices.

Of this cost about 7s. 1d., or 46 per cent., was paid directly to manual labour employed in and about the mines.

The cost of producing bituminous coal was about 17s. per ton, the labour-cost being nearly 7s. 3d., or about 42 per cent. of the total; of semi-bituminous, 14s. 5d., including a labour-cost of 8s. 2d., or nearly 57 per cent.; of brown coal, 13s. 1d., the labour-charge being 8s., or nearly 60 per cent. of the total cost.

(ii.) The cost of distribution of coal at the time of the inquiry (September to January, 1918–19) is estimated for the chief centres in Chapter III, pages 38, 44, 48, 52, and 54 (see in particular Tables 35, 36, 38, 42, 43, 46, 47, 48, 54–56, 58, 63, 65, and 70, and their immediate context).

The freight-charges vary according to the distances. The costs per ton of retailing the standard household coals were as set forth in Table 88.

TABLE 88.—DISTRIBUTING-COSTS OF STANDARD HOUSE COALS, 1918.

Centre.				Railage or Freight.	Wholesalers' Gross Profit.	Retailers' Gross Profit.
				s. d.	s. d.	s. d.
Auckland	..	..	..	7 11	6 9	7 9
Wellington	..	..	..	9 7	2 5	15 0
Christchurch (i)	..	..	..	15 0	4 6	12 6
„ (ii)	..	..	..	13 6	3 0	11 0
„ (iii)	..	..	..	5 9	5 3	9 0
Dunedin	..	..	..	6 7	..	9 0
Invercargill	..	..	..	6 0	..	9 6

The gross profits are analysed in the text into their constituent parts—bagging and loading, delivery into yard, yard expenses, delivery to consumer, overhead and other expenses, net profits.

REFERENCE NO. 2.—ANY INCREASE IN THE COST OF SUCH PRODUCTION AND DISTRIBUTION SINCE THE COMMENCEMENT OF THE PRESENT WAR, AND THE CAUSES OF SUCH INCREASES.

(i.) *Increase in the Cost of Production of Coal, 1913-14 to 1917-18.*

The average mining-cost per ton increased at every one of the principal mines except at one, where abnormal and increasingly favourable working-conditions ruled. The total cost of production per ton of coal mined at all the mines, giving returns for every year of the period 1913-18 inclusive, increased about 41 per cent., or 4s. 10d. per ton.

Taking into account the cost at all the mines, whether giving returns for all the earlier years of the period or not, the increase in the cost of production was about 31 per cent., or 3s. 7d. a ton. This latter figure underestimates the actual rise in the cost of production of all coal produced over the period.

The cost of mining bituminous coal at all mines giving data for every year increased about 43 per cent., or by 5s. 5d. a ton.; at all the mines from which exact particulars were obtained, by 40 per cent., or 4s. 9d.

The corresponding increases in the mining-costs of semi-bituminous coals were 13 per cent. or 1s. 6d. a ton, and 31 per cent. or 3s. 5d. a ton. The mine showing a decrease in the cost during the period was one producing semi-bituminous coal.

The corresponding increases for brown-coal production were 70 per cent. or 8s. 4d. a ton, and 25 per cent. or 2s. 7d. a ton. Certain new brown-coal mines came into operation after the beginning of the period under review.

The analysis of cost of production is shown in Chapter II, pages 24-31 (see Tables 15 to 24 and context).

The increases in the cost of production have been made up of increases in every separate item of cost, and have been caused by rises in the prices of materials and the labour necessary, increased taxation, and diminished output due to a reduction in the number of mine workers, the smaller output increasing the share of standing charges for each ton raised. In the case of a few mines industrial disputes and a slight falling-off in the output per miner have tended to increase cost.

The cost of production per ton due to the wages of manual labour in and about the mines increased at those mines giving returns for every year of the period by 31 per cent., or 1s. 10d. a ton—that is, by an amount equal to 38 per cent. of the increase in the total cost of production. If account be taken of the labour-cost per ton of all coal concerning which exact particulars were given, whether produced at mines giving returns over the whole period or not, the increase in the labour-cost is 20 per cent., or 1s. 2d. a ton, an amount equal to 33 per cent. of the increase in the total cost of production. The increase in the labour-cost of production of all coal mined in New Zealand during 1913-18 may be estimated at a little more than a third of the increase in the total cost of production at the mines.

The changes in the cost of stores and materials per ton of coal raised ranged from a decrease of about 2d. at one mine to an increase of 1s. 8d. at another. The corresponding range for maintenance and renewals was 11d. decrease to 1s. 9½d. increase; for rates and taxes, 2d. decrease (State mine) to 1s. 9½d. increase; for administration, 11½d. decrease to 1s. 1½d. increase; for royalties and rents, 4½d. decrease to 3d. increase; and for depreciation and sinking-fund charges (actually made), 1s. 2d. decrease to 8½d. increase.

The relation of lost time to cost of production and output is discussed on pages 31-4.

(ii.) *Increase in the Cost of Distribution of Coal, 1913-14 to 1918.*

This cost has increased everywhere as regards both costs of transport and the costs of conducting wholesale and retail businesses.

Chapter III, section 1 (ii), pages 36-7, deals with changes in transport-costs since 1913. Railage has increased 21 per cent. The general increase in shipping-rates cannot be so definitely measured by a percentage, because of the unequal distribution over the various routes of the particular increases. New Zealand coastal rates advanced from 42 per cent. to 55 per cent.; Newcastle rates by about 52 per cent., on the average. (A recent rise—March, 1919—of 3s. 6d. per ton, or over 21 per cent., on the rates from Newcastle to the chief ports has not been included in this estimate.) The increased cost of transport has been caused by rises in the prices of bunker coal, labour, stores, victualling, and the general costs of working ships. The increased cost per ton of working coal-ships in the New Zealand coastal trade between 1914 and 1918 amounted to nearly 50 per cent.

Dealers' costs have increased because siding and yard rents, the wages of carters and yardmen, the price of sacks, of horse-feed, of repairs and renewals, of gear, and general expenses have all risen, some of them very considerably; and also to a large extent because the shortage in the supplies of coal, necessitating delivery in small lots, has greatly increased the cost of delivery per ton to the consumer. Table 70A (p. 55) shows the amount of the increase in the cost of distribution of standard household coals during the period 1913-18 at the largest centres, distinguishing between transport, wholesale, and retail increased charges. The detailed estimates of the increases are summarized in Tables 37, 39-42, 44-45, 47, 49, 51-53, 56-57, 59-62, and 66-69, and their context.

REFERENCE NO. 3. —WHETHER THE PROFITS MADE IN THE PRODUCTION AND DISTRIBUTION OF COAL ARE FAIR AND REASONABLE.

(i.) *Profits in Production.* (See Chapter IV, Section 1, pp. 56–61.)

The annual average differences between the average selling-price per ton and the average cost per ton to the several mining companies over the whole period range from a loss of 1s. 11d. to a gain of 1s. 10d. (See Table 73, p. 57.) In four cases out of thirteen principal collieries there was a loss on the average; in two cases the average profit was less than 6d.; in two cases between 6d. and 1s.; in four cases between 1s. and 1s. 3d.; and in the other case 1s. 9-93d.

If the increase in the average selling-price for the industry as a whole be calculated from the available data in the same manner as the increase in the cost of production it is found that the selling-price of those mines for which data is available over the whole period 1913–18 increased, when due allowance has been made for relative outputs, by 36 per cent. *i.e.*, from about 14s. 3d. to 19s. 5d. per ton. This figure is to be compared with that showing the increase in total cost of production—*viz.*, 37 per cent.*

When we compare the selling-prices of all coals for which exact details were available in each year, whether from collieries working over the whole period or not, the increase in selling-price is 22 per cent. This figure, however, as in the case of cost of production, does not give a true measure of the change of the price of all coals, since the selling-prices and cost of the mines for which exact particulars were not available for 1913 were on the average lower than those of the mines providing data for that year. This figure was lower during 1914–15–16 than in 1913. In 1916–17 it rose 11 per cent. above the 1913 level, and in 1917–18 22 per cent. The selling-price of bituminous coal increased 35 per cent. (3s. 2d.) during the period, though the cost rose 40 per cent.; that of semi-bituminous coal rose 34 per cent. (5s. 7d.) or slightly more than its cost; that of brown coal 22 per cent. (2s. 7d.), as against a rise of 25 per cent. in cost. The increase in the price of brown coal for 1917–18 when compared with 1913–14 (a better basis of comparison in view of the incomplete data for brown-coal mines for 1913) is 30 per cent. (3s. 1d.), the corresponding increase in cost of production being 31 per cent.

If the properly weighted average selling-price be compared with the corresponding average cost of production for the mines giving returns for the years 1913–18 *the margins between cost and price are 9d. and 10d. a ton for 1913 and 1918 respectively*, or 5·6 and 4·5 per cent. of the cost of production. *A comparison of the similar margins for all mines giving data, whether over the whole period or not, shows a reduction from 9d. to 5d. a ton, the latter representing 2·2 per cent. of the average cost.*

Table 75A (p. 58) summarizes the chief facts regarding average cost of production, selling-prices, and profits per ton for the coal-mining industry as a whole, 1913–18.

The mining companies have not increased their gains from the industry during the war period relatively to their costs. It is further to be noted that in many cases certain charges are not sufficiently provided for in their costs.

Of the twelve principal coal-mining companies the highest average annual dividend for the last six years is 10 per cent. (earned by a company which for seventeen years, 1880–97, paid no dividend at all); the lowest average is nil. Of the twelve, two paid an average dividend of from 7½ to 10 per cent.; two from 5 to 7½ per cent.; four of from 2½ to 5 per cent.; one paid below 2½ per cent.; and three paid no dividend during the period.

The average rate of dividend paid during the period, weighted according to the relative sizes of the capitals of the different companies, was 4·8 per cent.

The average rate of total gains made by the companies—that is, including undivided as well as divided profits—was 5·1 per cent. Out of this the industry has to provide interest to the shareholders, and a large part of the insurance, depreciation, and sinking-fund charges.

The general conclusion is that the rate of profit made in the production of coal, taking the industry as a whole, is unduly low.

A large amount of capital invested in coal-mining in New Zealand in the past has been lost without making any returns to the owners.

(ii.) *Profits in Distribution.* (See Chapter IV, Section 2, pp. 61–2.)

It is assumed that the question of the reasonableness of distributors' profits refers to coal-dealing in existing conditions and with the present methods of distribution.

The general conclusion is that, except in the case of those dealers who are engaged in the retail trade on a large scale, the difference between the cost of coal to the dealers and the price received by them affords but a mere living to those engaged in it. The profits of the retail dealers cannot be assessed as exactly as those of the mining companies, because of the mixed nature of the business conducted by them, but the evidence does not support the charge that they are unreasonably high. Estimates of the net profits per ton at the several centres are given in Chapter III, Tables 38, 41, 46–47, 54, 56, 62, and 70, and context.

* The comparison is with the increase of 37 per cent., not that of 41 per cent. (see p. 26), since the mining companies have to pay out of their selling-prices the cost of haulage from mines to shipping ports.

Profits in the transport of coal appear to be higher than in mining or retail distribution. For the period 1914-17 the profit earned on the carriage of coal in certain typical parts of the New Zealand coastal trade appears to have ranged from 1s. to 1s. 3d. a ton, from which depreciation, sinking fund, and periodical overhaul charges have to be deducted. These profits would have been much higher if the shipping in question had availed itself of the many opportunities for much more profitable work abroad during the war period. Higher margins of profit were undoubtedly earned by foreign-owned shipping carrying coal to the Dominion.

REFERENCE NO. 4.—WHETHER THE SELLING-PRICES OF COAL ARE FAIR AND REASONABLE.

This question has already been answered in the last section. There is no doubt that the price of coal could have been raised much higher than it actually was during the last two winters in view of the competition of consumers for the diminished supplies, but for the influence of public opinion, the action of the local Coal Committees set up by the Ministry of Munitions and Supplies, and the pressure in certain cases brought to bear by some of the leading colliery-owners and large distributors upon the general body of retailers in the direction of discouraging proposed increases in retail prices. In many cases the smaller dealers largely dependent upon coal suffered considerably through prices not rising sufficiently to return them working-expenses.

REFERENCE NO. 5.—WHETHER INCREASED ECONOMY OR EFFICIENCY CAN BE OBTAINED IN THE PRODUCTION AND DISTRIBUTION OF COAL, AND, IF SO, IN WHAT MANNER.

As this question has been discussed in sections 2, 3, and 4 of this chapter, pages 86-90, it is not necessary to repeat the recommendations specified there.

REFERENCE NO. 6.—ALL OTHER MATTERS AFFECTING THE SUPPLY OR PRICE OF COAL.

These also have been included in an earlier section of this chapter. Without undue repetition we should like to emphasize here—

- (i.) The necessity for State encouragement of scientific research and its application to the problem of coal-mining and the utilization of the small coals of the Dominion. A much fuller advantage may be taken of the work done and the advice given by the State Geological Department, and the University colleges should receive generous financial assistance in the development of research.
- (ii.) The equal importance of an improvement in the industrial organization of labour at the mines and in its general social environment, particularly in respect of housing and better educational facilities.
- (iii.) Systematic technical education in the domestic use of coal so as to diminish considerably the present great waste due to ignorance of the possibilities of small and mixed coals, and of the proper methods of stoking ovens and grates.
- (iv.) Discouraging every form of inflation of the currency, which inevitably leads to rising prices at the expense of the poorer members of the community.

REFERENCE NO. 7.—THE INCREASES SINCE THE COMMENCEMENT OF THE WAR IN THE COST OF LIVING SO FAR AS SUCH INCREASES AFFECT MEN ENGAGED IN THE PRODUCTION OF COAL, DISTINGUISHING BETWEEN INCREASES, IF ANY, PRIOR TO AND SUBSEQUENT TO THE INDUSTRIAL AGREEMENTS MADE IN THE COAL INDUSTRY IN THE YEAR 1917.

This section of the inquiry presented special difficulties, which, owing to the abnormal character of the period during which the Board was conducting its investigations—*i.e.*, the period of the influenza epidemic—we were not in a position altogether to overcome. (See Chapter VI, section 1, p. 77.)

From the data at its disposal the Board estimates the increase in the "expenditure on living" at the minefields from 1913 to about September, 1918, to be about 35 per cent. at the most. Table 87 shows how this increase is distributed over the five standard classes of expenditure.

A more intensive investigation is necessary.

The chief factors tending to counterbalance the rise in the cost of living have been the increases in the rates of wages to mine workers, which, together with improvements in the conditions of their work, increased opportunities of employment, and in some cases a longer working-year, have resulted in substantial additions to their actual annual earnings. In the case of many of the underground workers the additional earnings have fully compensated for the rise in the cost of living even at the pre-war standard, although the adjustments made in the rates of pay by means of the bonuses granted in 1916 and 1917 (as well as in 1918) lagged behind the increases in their expenditure (see Chapter VI, section 4, pp. 79-80). In other cases, and particularly in the case of the surface men on day wages, the increases in actual earnings do not appear to have fully compensated for the increased expenditure necessitated by living at the pre-war standard.

Other compensating factors, such as any increase in actual family earnings as distinguished from individual earnings, it was not possible to determine statistically from the available material.

We take the view that the order of reference does not require us to express our opinion upon the question whether wages-rates ought to be raised whenever and because the cost of living increases.

REFERENCE NO. 8.—THE INCREASES SINCE THE COMMENCEMENT OF THE PRESENT WAR IN THE EARNINGS OF THE MEN ENGAGED IN THE PRODUCTION OF COAL, DISTINGUISHING BETWEEN INCREASES, IF ANY, PRIOR TO AND SUBSEQUENT TO THE SAID AGREEMENTS.

Up to September, 1918, the rates of pay to miners (hewers) had increased by $17\frac{1}{2}$ per cent. by two bonuses, one of 10 per cent. in the first half of 1916 and the other of $7\frac{1}{2}$ per cent. about the middle of 1917; all other workers in and about the mines received two bonuses each of 10 per cent. at the same time. From September to October, 1918, miners received 25 per cent. increase on the 1914 rates of pay, and other workers 30 per cent.

Mine workers generally, as explained in Chapter V, section 3, pages 65-6, have received increased actual earnings beyond the increases in the rates of pay. The increase in labour-cost of production has been already stated in this summary (see p. 92). Underground workers' earnings have increased in some cases beyond 50 per cent., and the average increase cannot be far from 30 per cent. as between 1913 and 1918. These increases have been due not only to the increase in the rates, but also to the fact that the mine-work has during the war been concentrated largely on those parts of the mines where the conditions of production are most favourable to a high output per worker, and that more time in the year has been put in by workers in many cases.

The increase in the wages actually earned by surface workers does not exceed the increase in their rates of pay to such a degree as in the case of miners, but earnings in excess of the increased rates are the rule.

The increases in miners' actual earnings have a very close connection with the increases in the rates of pay provided for by the industrial agreements of 1916 and 1917; these were followed in most cases by a more than proportionate increase in actual earnings, the whole of which, however, as pointed out above, cannot be ascribed to the increased rates alone. (For the several factors bearing upon actual earnings see Chapter V, section 2, pp. 63-5.)

While the mine-worker's income has increased, his expenditure on tools and other necessities used in the mine, which he provides wholly or in part, has increased by at least £10 a year. His cost of living has also increased (see last section).

The "real wages" of the mine worker as defined and discussed in Chapter V, pages 69-76, had increased very little, if at all, by September, 1918, unless the unknown factor, family earnings, had increased. The effect of the third bonus then granted should be to increase them beyond their level in 1913-14.

It is to be noted that these results, like those in respect of profits, are generalizations or averages true of the mass, and that there are to be found within the period particular cases, both of individuals and mines, showing considerable divergency on either side from the average.

W. G. McDONALD,	} Members of Board.
J. R. HART,	
P. HALLY,	
JAMES HIGHT, Assessor.	

J. W. COLLINS, Secretary.

SUMMARY OF CONTENTS.

NOTE.—This is rather a selection of some of the more important facts and an indication of the main contents of the report than a real summary. The report itself is so condensed and sets forth so much detailed information that it is difficult to provide a true summary in brief compass. An attempt is made in Chapter VIII, section 6, page 91, which arranges the chief findings under each of the eight heads of the order of reference.

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APPENDICES.

APPENDIX A.

EVIDENCE GIVEN BY CHARLES NORTON BOULT, ENGINEER TO THE WESTPORT HARBOUR BOARD, IN CONNECTION WITH THE COAL-MINING INDUSTRY.

Mr. McDonald : I would like you to explain to us the relationship between the harbour and the general coal question and the general trade of the district.

Mr. Boulton : It is quite obvious that all the coal that is produced or that will be produced in this district must go through this harbour. There is no possibility of any other outlet that could possibly compete with water carriage, whereas it is possible that Grey coal might be railed here and sent from here by sea. This harbour is limited, first of all, by its bar. The harbour is naturally developed by means of training-walls to a depth of some 12½ ft. of water at low water, ordinary spring tides, but it has to be further developed by means of dredging to a workable-depth for our coal-boats to come in and out. In 1918 on over two hundred days of the year we had a working-depth of from 17 ft. to 18 ft. at low water, and to that may be added from 5½ ft. to 9½ ft. rise—that is, neaps and spring-tide rise. The bar is continuous and keeps forming; it is formed partly by the westerly sand-drift which is making up the coast all the time, and partly by the detritus that comes down the river. At the present time the harbour has a first-class suction dredge on the bar, and that is holding the water at the depth I have indicated; but the banks of the Buller River being soft and low, the river washes down enormous quantities of gravel from erosion, and the Board has at present only one very obsolete bucket dredger, which is about forty years old and about done, to cope with the banks forming here, which finally reach the entrance, and we should really be dredging the river for about seven or eight miles up. Instead of that, there is a series of gravel-banks forming from right down at the lower end of our berthage area up to the Nine-mile. As soon as you begin to disturb these banks you get a constant flow of detritus down the river. We have tried to dredge out a local area, and each time it is filled up almost at once. To open this bar is a question of dredging very large quantities of material. So far we have dredged about an average of 100,000 cubic yards a year. At present we have only got a plant which is on its last legs, and it would take some two or three years to get a suitable plant; and unless we get a plant not only will the river not be fit to cope with the increased trade, but it will go considerably back from what it is at present, and I anticipate that there will be considerable difficulty in handling boats in this port unless a bucket plant is obtained. Further development on the bar would necessitate a larger and more powerful suction dredger out there. I cannot sound too strongly the note of warning about the condition this port will be in in a few years. You will not only be no better off, but you will be worse off.

Dr. Hight : What expenses will be involved?—We have one suction dredger here which is suitable for a hopper. My idea is that you cannot use the type of bucket dredger which is in use in New Zealand. The idea is to have hoppers which steam up to the dredge and take away a load. I have one suction dredge which would be suitable for a hopper. I would require to buy a large bucket dredger with a capacity of about 1,000 tons an hour, and another hopper. Two hoppers would do us amply here. A dredge of the size indicated and one hopper would have cost before the war not more than £72,000. What it would cost to-day I am not prepared to say. Without interest their running-costs would be something like £9,000 a year. Such a plant could, I suppose, in four years develop this harbour sufficiently to enable them to keep it open by working only, say, four months in a year. In that case the plant, being the only one of its kind in New Zealand, would readily get jobs all over the Dominion, because there is no plant of the kind here. That is entirely a question of river-dredging. The bar is being dealt with to a certain extent. You can see that the constant flow of detritus down the river is putting more work on the bar-dredger. A further bucket dredger for the bar in pre-war times would have cost another £65,000.

Dr. Hight : What is the biggest collier that the bar will take through now?—That is a matter for the Harbourmaster to judge. It is his personal business to say which vessels he will allow through. I only provide the water. I suppose it is one of the most difficult bars in the world to deal with.

Mr. McDonald : Your contention is that unless the authorities, who in this case are the Harbour Board and the Government combined, immediately take steps to provide additional facilities for dredging the river there is a serious danger of the coal trade of Westport being throttled, and that even if steps were taken now it would be two or three years before any effect was felt?—That is my meaning, and therefore this matter should be represented to the Government in connection with the coal-supply of the Dominion. A new bucket dredger such as I have indicated would deal adequately and efficiently with all the necessities of this harbour for the next thirty-five years.

APPENDIX B.

MEMORANDUM BY THE GENERAL MANAGER OF THE NEW ZEALAND RAILWAYS ON CERTAIN MATTERS
SUBMITTED BY THE BOARD TO HIM.

1. THE profits made by the railways in regard to any particular class of traffic are not ascertained. The impossibility of keeping actual separate records of the cost of handling different classes of traffic, where traffic of all descriptions is dealt with on practically all trains, is obvious.

2. The practicability of running a mineral express train from Huntly to Marton :—

The question of the improvement of through goods services is one which is always before the Department, and where a regular business in train-loads is available between two particular stations the Department's practice is to provide a regular service to deal with it. It is only, however, where full train-loads can be obtained from one station to another that this practice can be carried into effect with due regard to economy of operation. In the case of a through mineral-train from Frankton Junction to Marton, there is not sufficient business between the two terminal points mentioned to provide a full train-load. While a mineral-train might be despatched from Frankton Junction fully loaded, the proportion of the load which would ordinarily be consigned to wayside stations between there and Marton is such that for a considerable portion of the journey the train would be running unprofitably unless the Department made provision (as it does) for other traffic to be lifted to compensate for the coal put off *en route*.

The distance from Huntly to Marton is 246 miles, and the existing services provide for coal traffic being carried between those points in twenty-seven, thirty, and thirty-nine hours respectively. These services compare favourably with services in any other part of the world for the handling of unperishable wayside traffic.

3. The railway consumption of coal :—

(a.) The Department's system of purchase of coal is by calling for tenders for the supply and delivery required for a period of one year. In cases where no tenders are accepted coal is purchased under special agreement as to quantity and price per ton.

(b.) The comparative steaming-values of different classes of coal can be determined only by exhaustive special trials; and owing to the exceptional conditions prevailing during recent years such trials have been temporarily discontinued, with the result that the data which is available does not accurately disclose the condition to-day, owing partly to certain classes of the coal being now off the market, and in other cases the quality of the seam having altered.

The Department has, however, satisfied itself of the relative values of available coal; and so far as railway-locomotive requirements are concerned the best results are obtained from Newcastle coals from approved mines in the Maitland district, such as Bellbird, Stanford Merthyr, Abermain, Aberdaire, Pelawmain, Neath, and Hebburn. Next in order come Westport, Westport-Stockton, Liverpool State Mine, Blackball, and Point Elizabeth State Mine. These are all bituminous coals. Among the lignite coals of New Zealand, Hikurangi, Kaitangata, Taupiri, and Waronui give the best results.

The Department has at different times also obtained supplies from Nightcaps, Taratu, Waipa, and Pukemiro.

(c.) The possibility of using a larger proportion of—

(i.) New Zealand coals: For many years past the Railway Department has utilized all the suitable New Zealand coal which it has been able to obtain. The quantity has, however, been insufficient for the requirements of the Railway Department, and it has of necessity had to import considerable quantities of coal from Newcastle in order to maintain its services.

(i.) In regard to the question of an increased use of small coal, this is a matter that has been under the consideration of the Department for some time, and at the present moment the Department has in hand the installation of a pulverizing plant with a view to experimenting in the consumption of coaldust. Should the experiment turn out successfully there is a prospect of the Department consuming a considerable quantity of the fine coal which is at present a waste product. The effect of such increase in the consumption of coal-slack would be to largely reduce the Department's requirements in regard to large screened coal.

4. The rate of freight charges for the carriage of coal, with special reference to—

(i.) Changes since 1914 and their dates: Very favourable low rates are provided by the Railway Department for the carriage of coal produced in New Zealand, as may be seen by reference to the Department's scale of charges. The only changes in the railage rates on the New Zealand railways since 1914 consist of two general increases of 10 per cent., which came into force on the 19th September, 1915, and the 25th November, 1917.

(ii.) The differences in the rates on different lines—*e.g.*, Picton-Blenheim, Lyttelton-Christchurch, and Invercargill-Bluff: The rates on the lines mentioned vary only in regard to the total distance covered. From Picton to Blenheim, eighteen miles, the rate on New Zealand bituminous coal is 3s. 5d. per ton, and on native brown coal 2s. 6d. per ton. Between Invercargill and Bluff, seventeen miles, the rates are 3s. 3d. and 2s. 5d. Between Lyttelton and Christchurch, seven miles, the rates are 2s. 6d. and 1s. 9d. The above figures are all exclusive of wharfage charges, and are subject to the two surcharges of 10 per cent., and 10 per cent. mentioned in the previous question.

- (iii.) Method of estimating weights to be charged for: The weight of coal ex ships is ascertained by passing the railway-wagons over the Department's weighbridges. In the case of coal loaded in railway-wagons at local mines the weights are in almost all cases ascertained by the consignors—that is, the mining companies—for sale purposes and declared by them on the Department's consignment-notes. These weights are accepted by the Department, but are subject to periodical checks at irregular intervals by means of the Department's own weighbridges, and in cases where discrepancies are found the charges are computed on the Railway Department's weights. The responsibility for declaring the weight of the coal consigned rests on the consignor of the traffic; and as regards the bulk of this traffic from New Zealand mines, the wagons are not subject to reweighing by the Railway Department. The consigning company has the necessary weighing facilities, and is interested in ascertaining the correct weight of the outward traffic. The consignee, on the other hand, usually takes delivery of the coal in cart-loads, and can only arrive at the weight approximately by rough-and-ready methods. The Department therefore accepts the view that the probabilities are in favour of the consignor's weight being the more correct when dispute arises between the weight consigned and the weight received; and in any case, if the Department made allowance in freight for alleged shortages in the weight received, it will be evident that it would open the way to serious abuse.

5. Cause in delay of transport of coal: In the matter of transport coal is regarded as a non-perishable article, which, with other articles of a similar nature, is called upon when necessary to give way to traffic of more importance or of a perishable nature. The fact that coal can be utilized in this way to stand aside when necessary to permit of its being used for making up full train-loads is one of the factors in the direction of obtaining the maximum efficiency in operating, and enables the Department to carry the business at low rates of freight. If it became necessary for the Department to regard coal as traffic which must receive the promptest through transport it would inevitably be necessary for the Department to review the present rates of freight.

6. System of sidings for coal, loading and unloading of trucks: The coal companies provide their own siding-accommodation at mines, usually after consultation with the Railway Department's technical officers in regard to the requirements in view of the probable output. At destination stations where the volume of traffic warrants it coal is dealt with in particular sidings, is always placed there for discharge, and is carted from there by the dealers.

The discharge of coal is not undertaken by the Railway Department, but devolves upon the consignees; and, having regard to the nature of the traffic, the undesirability of avoidable handlings, and the extent to which the dealers cart direct from the railway-yard to consumers, this is probably the most efficient and economical method of dealing with the business. No mechanical means of discharge from railway-trucks are provided, and having regard to all the circumstances it is doubtful if such means would be economically practicable.

APPENDIX C.

STATEMENT SHOWING HOW THE COST OF MATERIAL PRINCIPALLY USED AT THE MINE AT POINT ELIZABETH HAS INCREASED FROM THE YEAR 1914 TO PRESENT DATE.

Material.	Per	Prices at Greymouth.				
		1914.	1915.	1916.	1917.	1918.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Axes	..	0 4 4	0 4 9	0 5 0	0 8 0	0 9 0
Bolts, engineers'—						
$\frac{1}{4}$ in. and $\frac{3}{8}$ in. ..	gross	0 9 0	0 9 0	0 12 0	0 16 0	0 19 0
$\frac{1}{2}$ in.	cwt.	1 10 0	1 18 0	2 12 0	3 8 6	4 4 0
$\frac{5}{8}$ in.	„	1 10 0	1 15 0	2 5 0	3 2 6	3 10 0
$\frac{3}{4}$ in.	„	1 10 0	1 8 0	2 2 6	2 19 6	3 5 0
Bolts, coach—						
$\frac{1}{4}$ in. and $\frac{3}{8}$ in. ..	gross	..	..	0 11 0	0 13 0	0 17 0
$\frac{1}{2}$ in.	cwt.	1 8 0	1 10 0	2 8 0	3 2 6	4 4 0
$\frac{5}{8}$ in.	„	1 4 0	1 5 0	2 2 6	2 18 6	3 10 0
$\frac{3}{4}$ in.	„	1 4 0	1 5 0	2 0 0	2 15 6	3 5 0
Brattice-cloth ..	square yard	0 0 6 $\frac{1}{4}$	0 0 9	0 0 10 $\frac{1}{8}$	0 1 0 $\frac{1}{2}$	0 1 2 $\frac{1}{2}$
Belting—						
$1\frac{1}{2}$ in.	foot	0 0 4 $\frac{1}{2}$	0 0 4	0 0 8	..	0 1 4
2 in.	„	0 0 5	0 0 7 $\frac{1}{2}$	0 0 10	..	0 1 6
3 in.	„	0 0 10	0 1 1	0 1 3	..	0 2 5
4 in.	„	0 1 11 $\frac{1}{2}$	0 1 4	0 1 9	..	0 3 3
5 in.	„	0 1 10 $\frac{1}{2}$	0 2 3	0 2 8	..	0 5 2
6 in.	„	0 3 0	0 3 6	0 4 0	..	0 6 4
8 in.	„	0 4 7	0 6 1	0 9 9	..	0 12 6

STATEMENT SHOWING HOW THE COST OF MATERIAL PRINCIPALLY USED AT THE MINE AT POINT ELIZABETH HAS INCREASED FROM THE YEAR 1914 TO PRESENT DATE—*continued*.

Material.	Per	Prices at Greymouth.				
		1914.	1915.	1916	1917.	1918.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Bran	sack	0 6 5	0 8 3	0 9 9	0 10 6	0 14 0
Chain, $\frac{7}{16}$ in. and $\frac{1}{2}$ in. ..	cwt.	1 17 0	2 5 0	3 0 0	3 15 0	4 5 0
Chaff	ton	4 17 6	7 15 0	..	8 12 6	11 10 0
Chalk	cwt.	0 10 0	0 12 0	..	0 19 0	1 14 0
Carbide	"	0 19 6	1 16 0	1 12 0	4 7 6	4 0 0
Cement	bag	0 4 2 $\frac{1}{2}$	0 4 7 $\frac{1}{2}$	0 5 2	..	..
Electric detonators ..	100	0 16 6	1 2 6	..	1 8 7	1 9 8
Dogs, rail	cwt.	1 2 6	1 8 6	..	2 11 0	3 19 0
Explosives—						
Gelignite	case	2 10 0	2 17 6	2 17 6	3 12 6	4 10 0
Viking	"	..	2 17 6	2 19 6	3 9 6	4 10 0
Monobel	"	..	2 14 6	..	3 9 6	..
Files	..	55% off list	45% off list	25% off list	15% off list	List.
Grease—						
Skip	ton	12 15 0	16 0 0	16 0 0	16 0 0	25 0 0
Antifriction	cwt.	1 0 0	1 3 0	1 4 9	1 12 6	2 7 6
Handles—						
Hammer	doz.	0 9 0	0 9 0	0 9 0	0 12 0	0 12 6
Shod pick	each	0 1 6	0 1 6	0 1 6	0 1 9	0 3 3
Unshod	dozen	0 10 0	0 10 0	0 10 0	0 10 0	0 10 0
Axe	"	0 11 6	0 12 0	0 12 0	0 12 6	1 10 0
Pan, shovel	"	0 12 0	0 15 0	0 15 0	0 18 0	1 2 0
Iron—						
Bar, flat	cwt.	0 11 6	0 17 6	1 5 6	..	1 11 0
Bar, round	"	0 11 6	0 17 6	1 4 0	..	1 11 0
Bar, square	"	0 11 6	0 17 6	1 5 6	..	1 11 0
Sheets	"	0 13 6	1 0 0	1 8 0	..	4 0 0
Angle	"	0 13 0	1 6 0	1 6 0	..	..
Shoeing	"	0 13 6	0 19 0	1 3 6	1 8 6	1 11 0
Plain galvanized ..	"	1 2 0	1 8 0	1 16 0	..	4 6 0
Corrugated	"	0 19 6	..	..	3 7 6	4 0 0
Lead—						
Ingot	cwt.	1 0 0	1 10 0	..	1 18 0	2 5 0
Red	"	1 8 0	1 12 0	2 10 0	..	4 14 0
White	"	1 16 0	2 6 0	2 13 0	3 5 0	4 10 0
Locks, Champion	each	0 2 6	0 2 6	0 2 9	0 4 2	0 4 2
Leather	lb.	0 2 9	0 2 9	0 3 0	0 4 3	0 4 3
Marline	"	0 0 7 $\frac{1}{2}$	0 1 0	0 0 9	0 2 11	0 2 0
Nuts—						
Hexagon	cwt.	1 6 0	1 8 0	1 11 0	..	3 13 0
Square	"	1 4 0	1 19 0	1 19 0	..	3 14 0
Nails—						
Wire, 1 $\frac{1}{2}$ in.	cwt.	0 15 0	1 2 0	2 0 0	..	3 0 0
Wire, 2 in.	"	0 15 0	1 2 6	1 18 0	..	3 0 0
Wire, 3 in.	"	0 15 0	1 0 0	1 7 6	..	2 17 0
Wire, 4 in., 5 in., 6 in. ..	"	0 15 0	0 19 0	1 6 0	..	2 17 0
Horse-shoe	lb.	0 0 6	0 0 6	0 0 9	0 1 0	0 2 6
Lead-head	cwt.	1 6 0	1 10 0	2 2 0	2 10 0	2 17 6
Copper	lb.	0 1 6	0 1 9	..	0 3 0	..
Oats	bushel	0 2 4	0 3 10	..	0 4 10	0 5 10
Oils—						
Cylinder	gallon	0 3 8	0 3 8	0 3 8	0 3 10 $\frac{1}{2}$	..
Machine	"	0 1 11	0 2 4 $\frac{1}{2}$	0 2 4 $\frac{1}{2}$	..	0 3 6
Arctic	"	0 2 8	0 2 8	0 2 8	0 2 10	..
Rope	"	0 2 6 $\frac{1}{2}$	0 2 6 $\frac{1}{2}$	0 2 6 $\frac{1}{2}$	..	0 2 9
Circulation	"	0 2 3	0 2 4	0 2 4	..	..
Boiled	"	0 5 1	0 4 3	..	0 5 3	0 10 0
Raw	"	0 5 0	0 4 3	0 4 3	0 5 3	0 10 6
Colza	"	0 2 11 $\frac{1}{4}$	0 2 11 $\frac{1}{4}$	0 2 11 $\frac{1}{4}$	0 3 11 $\frac{1}{4}$	0 6 0
Castor	"	0 3 6	0 2 11 $\frac{1}{4}$	0 2 11 $\frac{1}{4}$	0 4 8 $\frac{1}{2}$	0 5 0
Kerosene	case	0 8 6	0 8 8	0 8 0	0 13 8	0 16 0
Benzine	"	0 12 0	0 16 2	0 16 2	1 2 8	1 4 2

STATEMENT SHOWING HOW THE COST OF MATERIAL PRINCIPALLY USED AT THE MINE AT POINT ELIZABETH HAS INCREASED FROM THE YEAR 1914 TO PRESENT DATE—*continued*.

Material.	Per	Prices at Greymouth.				
		1914.	1915.	1916.	1917.	1918.
Picks—		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
2 lb.	doz.	0 16 0	0 18 0	0 18 0	..	..
2½ lb.	..	0 18 0	1 0 0	1 0 0	..	..
3 lb.	..	1 0 0	1 0 0	1 8 0	..	..
Rope—						
Hemp	cwt.	2 12 0	3 7 6	..	..	..
Steel, 1½ in. circumference..	..	2 16 0	2 6 0	2 11 6	..	3 7 0
Steel, 2 in. circumference ..	..	1 15 0	1 16 0	2 15 6	2 16 0	..
Steel, 2½ in. circumference..	..	1 18 6	1 19 9	2 15 0	2 10 0	..
Steel, 2½ in. circumference..	..	..	..	2 6 6	2 15 0	..
Steel, 2¾ in. circumference..	..	1 15 6	1 18 6	..	2 8 0	..
Steel, 3½ in. circumference..	..	1 18 0	..	..	2 8 6	..
Shovels—						
Long-handle, round mouth	each	0 3 8	0 3 8	0 4 0	0 6 8	0 6 8
Long-handle, square mouth	..	0 3 8	0 3 8	0 4 0	0 6 0	0 10 6
Firing	doz.	..	2 15 0	3 12 0	5 17 0	..
Pan.	each	0 4 0	0 6 0	0 6 6	..	..
Stove	..	0 4 2	0 5 6	0 5 9	0 5 9	0 5 9
Spikes	cwt.	0 18 0	1 5 0	..	2 8 0	..
Steel—						
Cast	cwt.	2 10 0	1 10 0	1 17 6	..	..
Mild	..	0 14 0	0 18 0	1 9 0	1 12 0	1 18 0
Octagon	..	1 10 0	1 12 0	2 0 0	3 0 0	4 4 0
Shear	..	2 10 0	2 2 0	..	..	..
Solder	lb.	0 1 6	0 1 9	0 1 9	0 1 9	0 2 3
Twine, binder	cwt.	2 11 0	2 11 0	2 11 0	3 5 0	4 4 0
Tacks, brattice	..	2 16 0	3 0 0	3 2 0	4 0 0	5 0 0
Waste, cotton	..	2 5 0	2 12 0	..	3 15 0	5 18 9
Wire, galvanized	..	0 12 9	1 2 0	1 14 0	1 14 0	2 16 6
Washers, iron, round	..	1 2 0	2 0 0	2 0 0	..	..
Mine-rails.. .. .	ton	..	10 13 6	9 14 6	15 15 0	26 3 6

The prices included on this schedule are what were actually paid by the State Coal-mines Department during the years specified.

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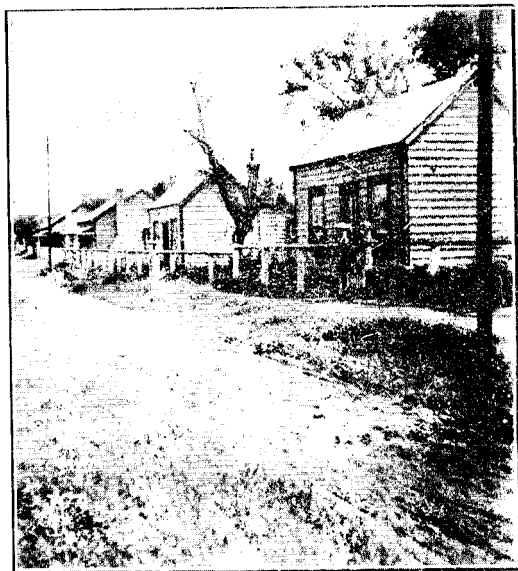
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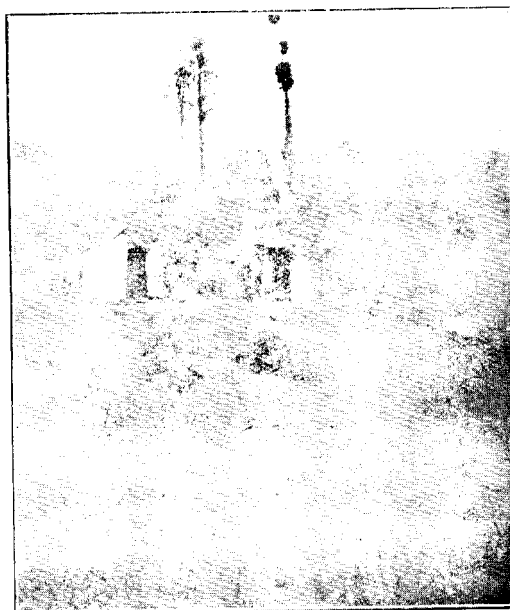
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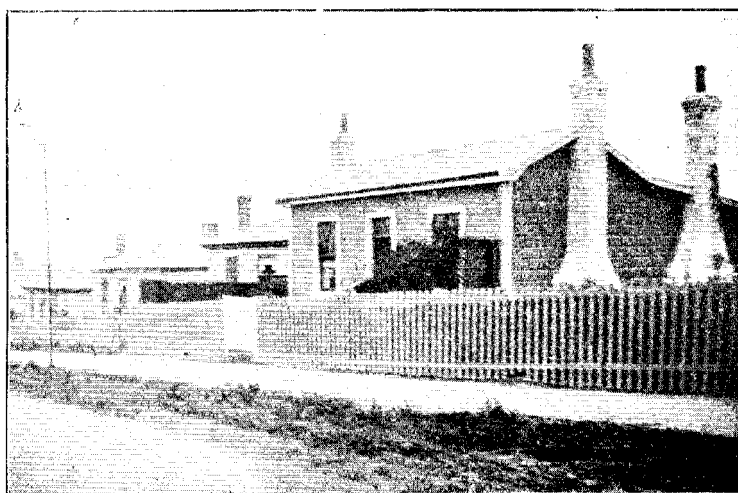
NO. 1. HUNTLY: COTTAGES OWNED BY THE COMPANY, AND LET AT 5s. PER WEEK.



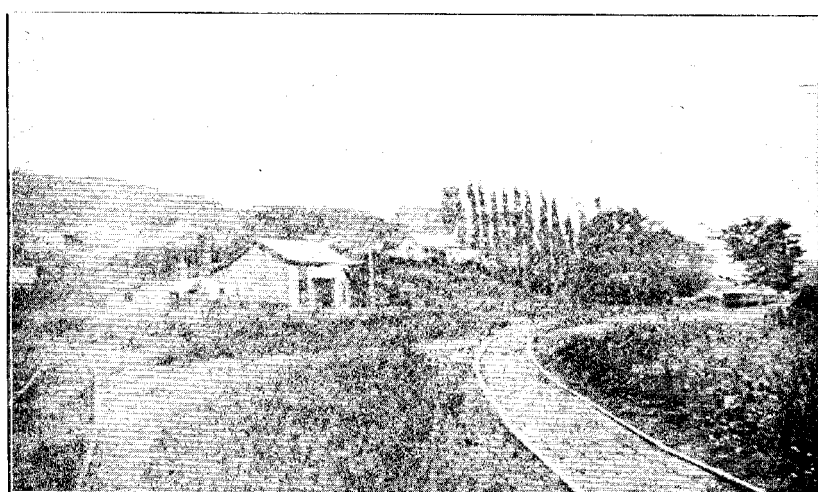
NO. 1A. PUKEMIRO: HUTS NEAR MINE.



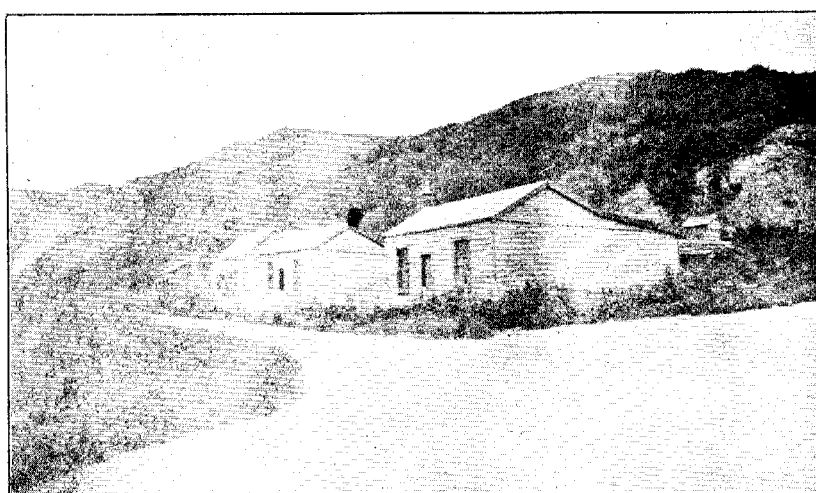
NO. 2. KAITANGATA: GENERAL VIEW.



NO. 3. KAITANGATA: SOME OF THE BEST HOMES, PRIVATELY OWNED.



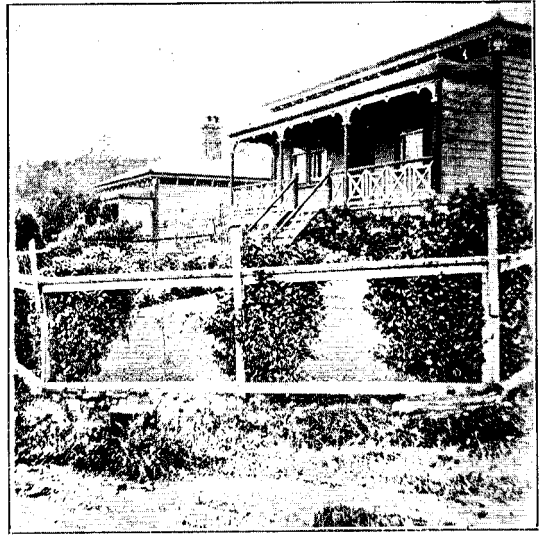
NO. 4. KAITANGATA: COLLECTION OF HOMES.



NO. 5. COLLECTION OF HOMES ON RISING GROUND NEAR MINE.



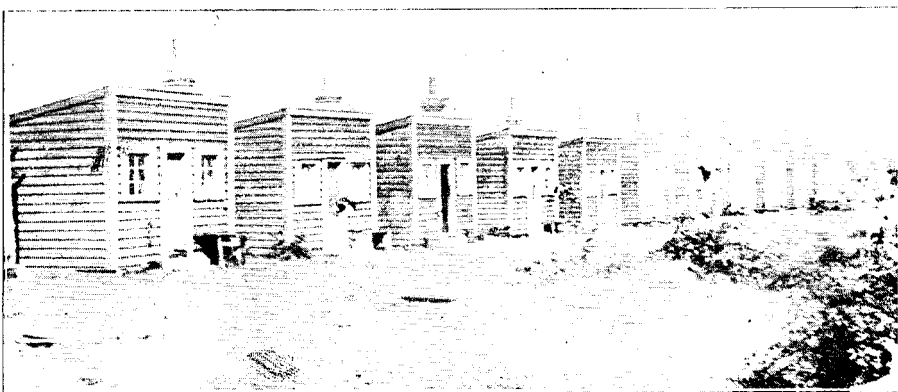
NO. 6. RUNANGA: GENERAL VIEW, SHOWING PRIVATELY OWNED HOMES AND THE MASONIC HALL.



NO. 7. ONE OF THE GOVERNMENT HOUSES, BEAUTIFULLY KEPT.

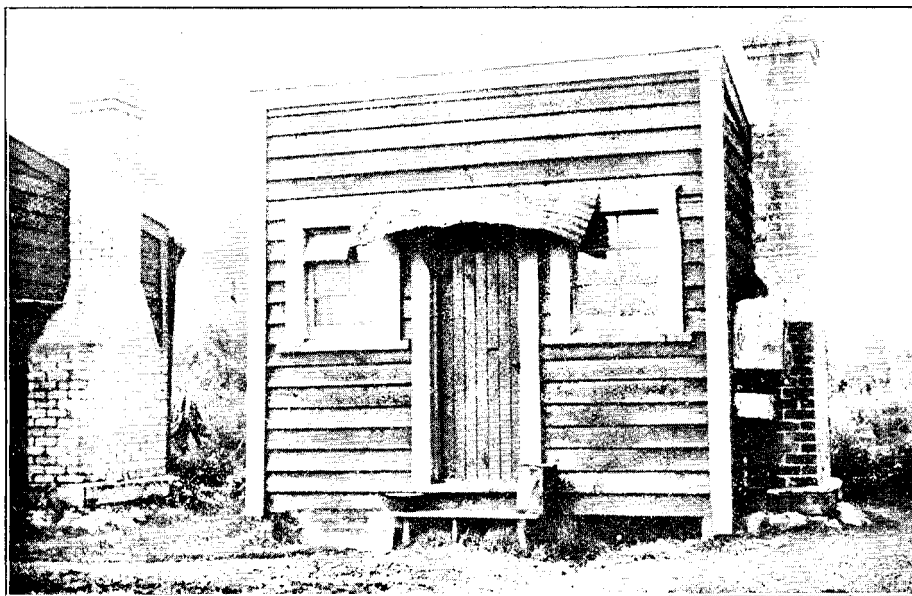


NO. 8. DUNOLLIE: LOOKING TOWARDS THE MINE.



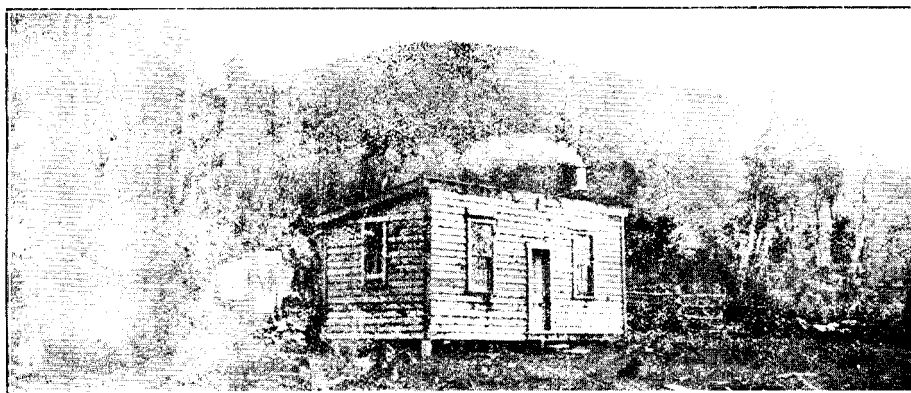
NO. 9. BLACKBALL: MINERS' HOMES.

11 ft. 6 in. by 9 ft. 6 in. Owned by the company, and let at 2s. 6d. per week.

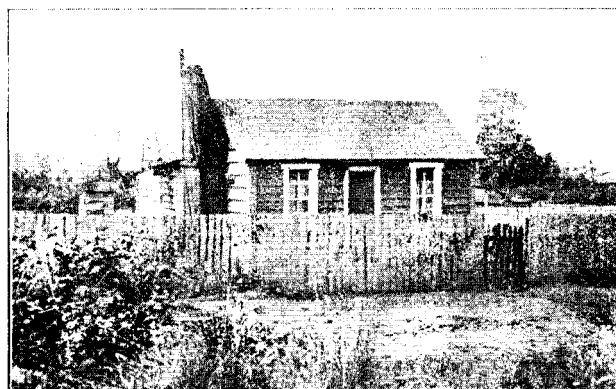


NO. 10. BLACKBALL: ONE OF THE HOUSES.

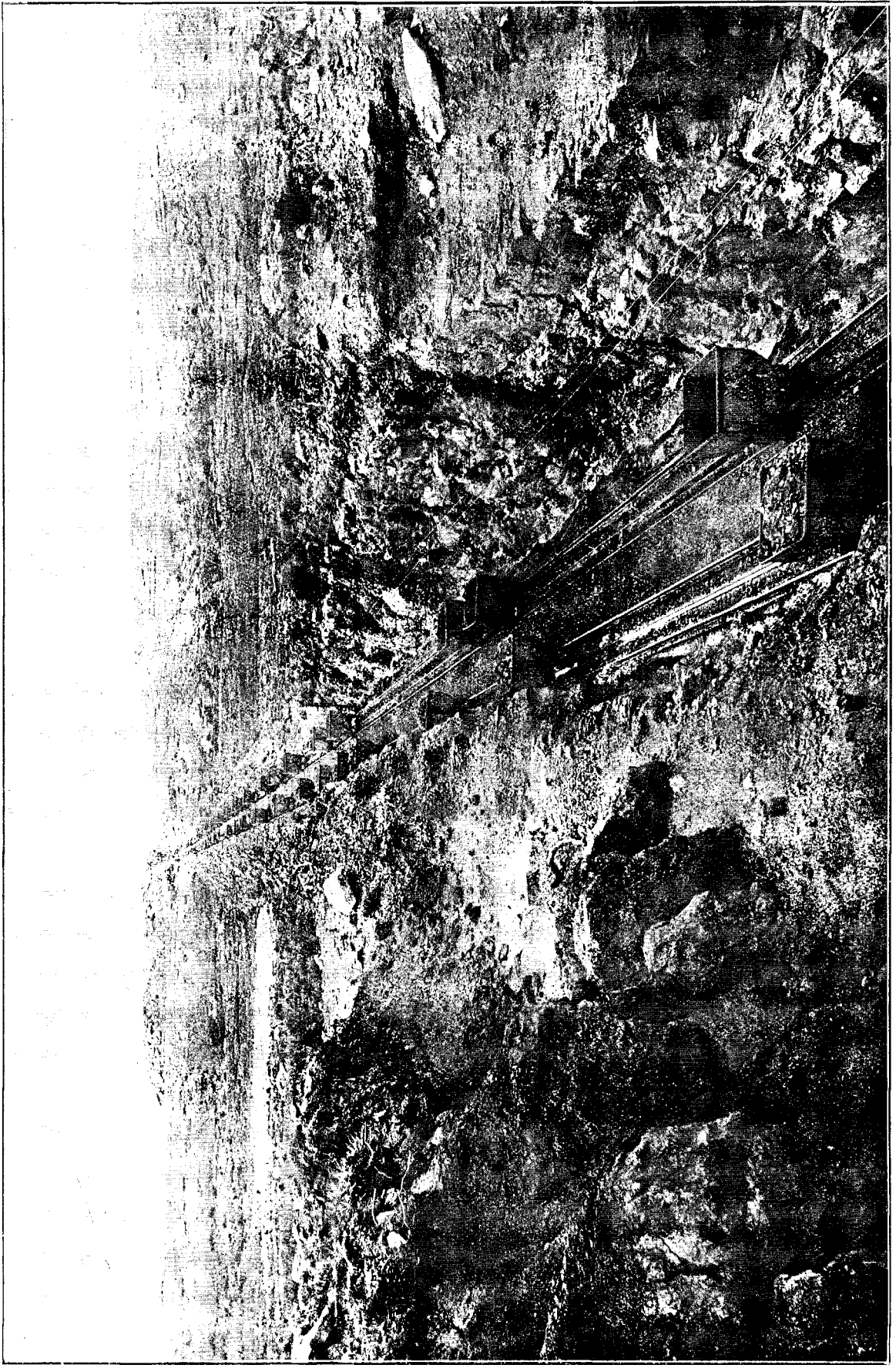
11 ft. 6 in. by 9 ft. 6 in. Height—front, 10 ft. 3 in.; back, 8 ft. 3 in. Space between huts, 7 ft. 6 in.



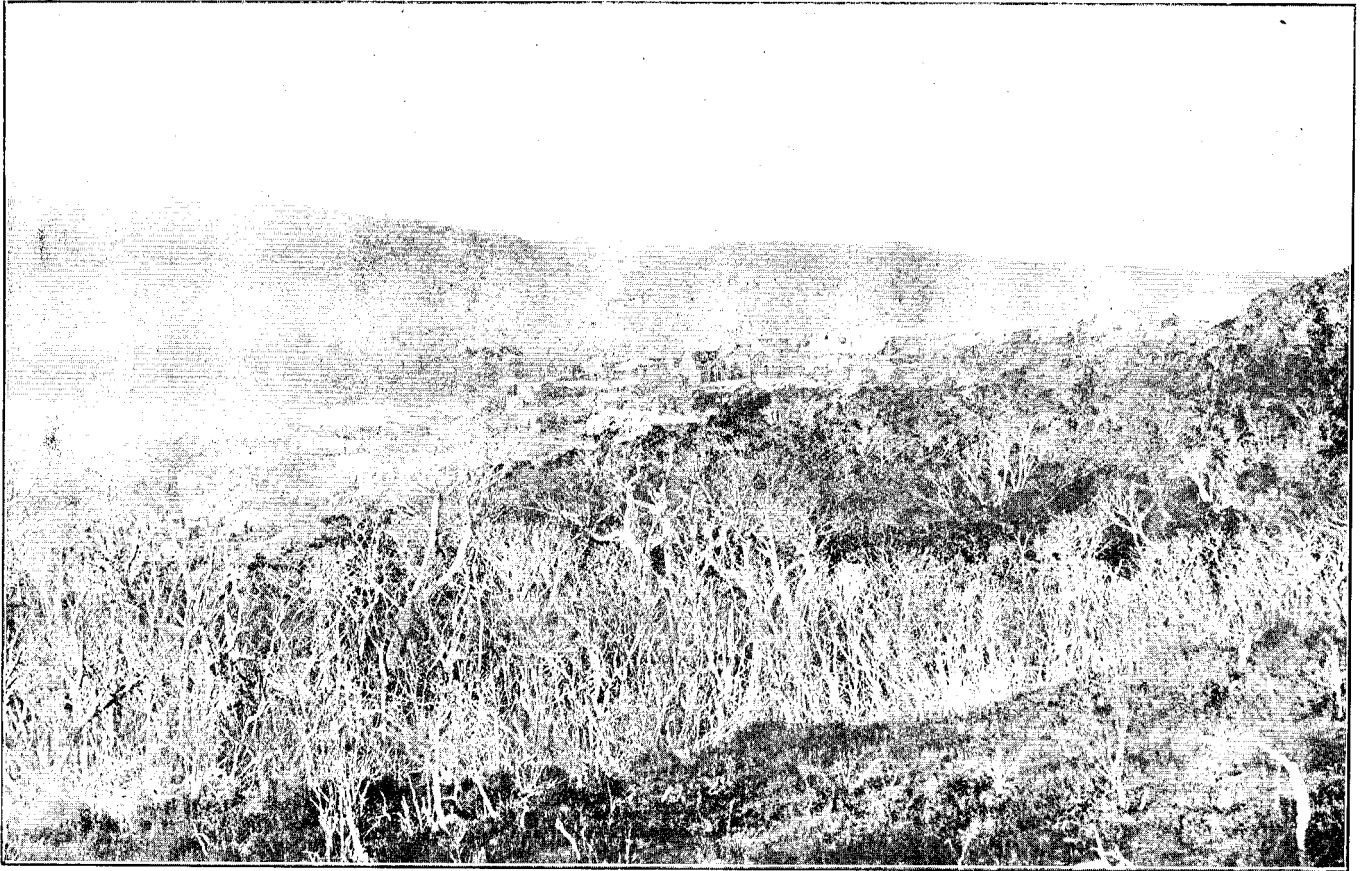
NO. 11. BLACKBALL: BETTER CLASS OF MINER'S HUT.



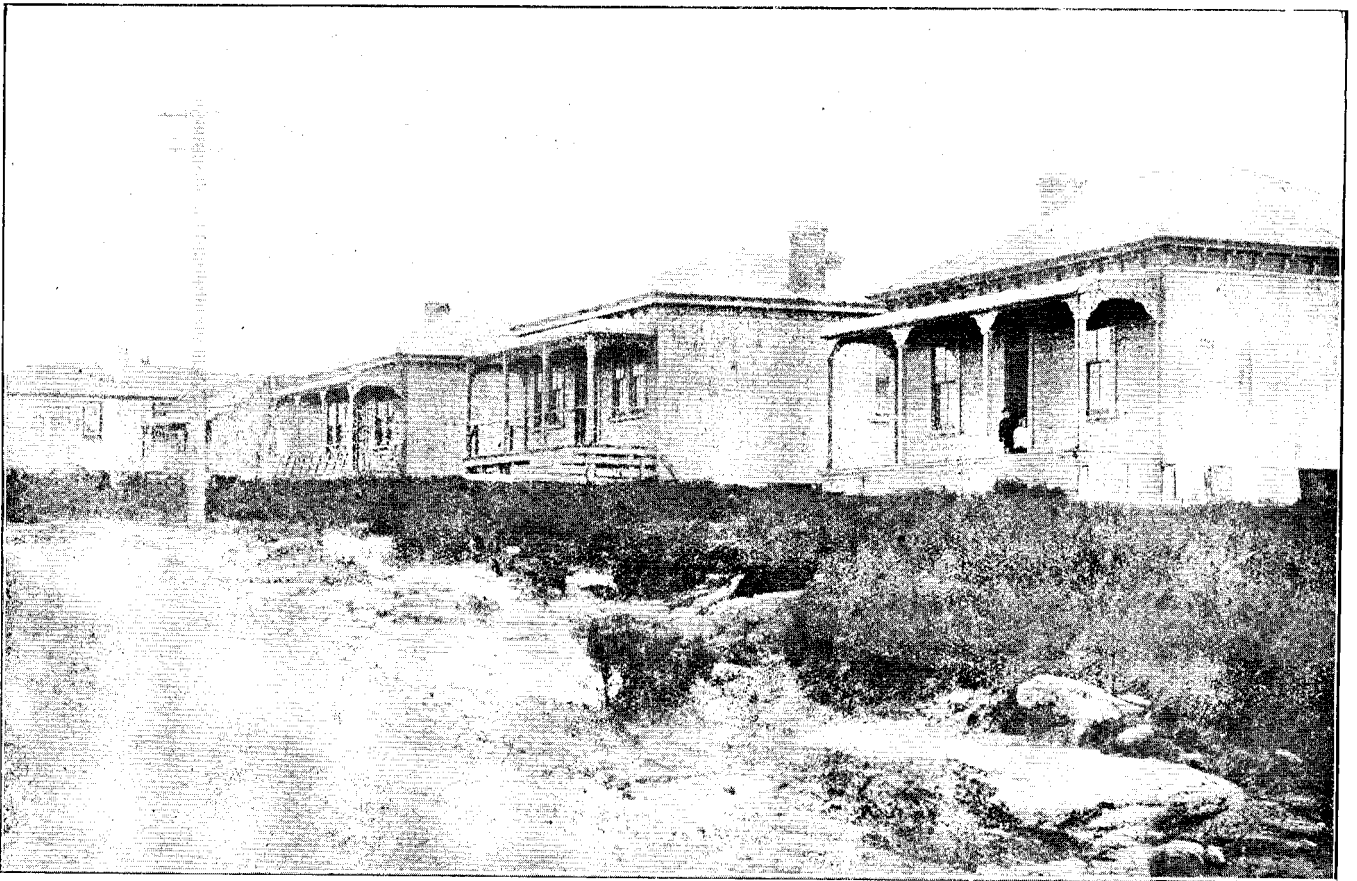
NO. 12. BLACKBALL: BETTER CLASS OF MINER'S HUT.



NO. 13.—PLATEAU BETWEEN DENNISTON AND BURNETT'S FACE ON WHICH IT IS SUGGESTED A TOWNSHIP SHOULD BE FORMED.



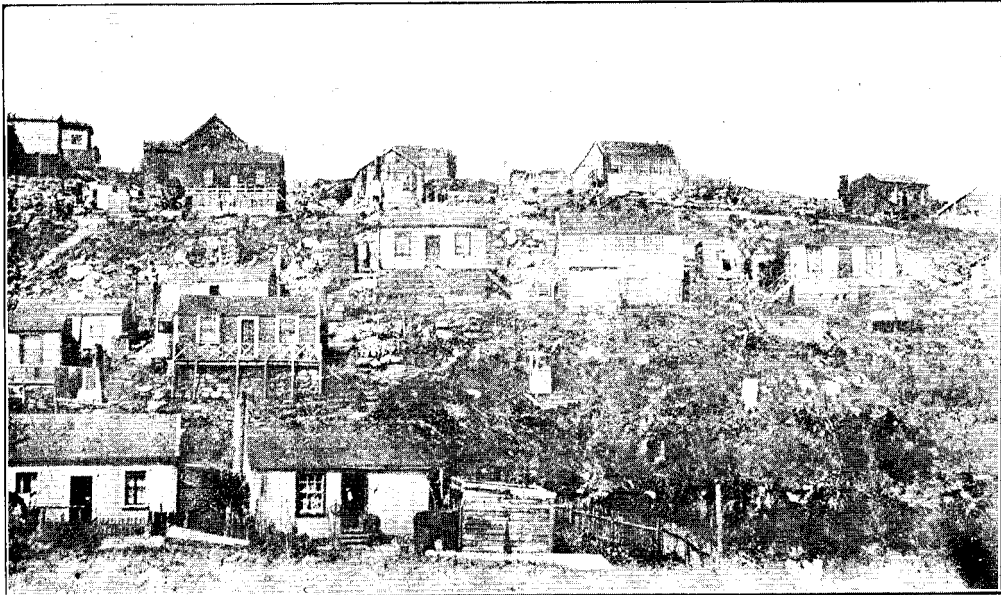
NO. 14. GENERAL VIEW OF DENNISTON.



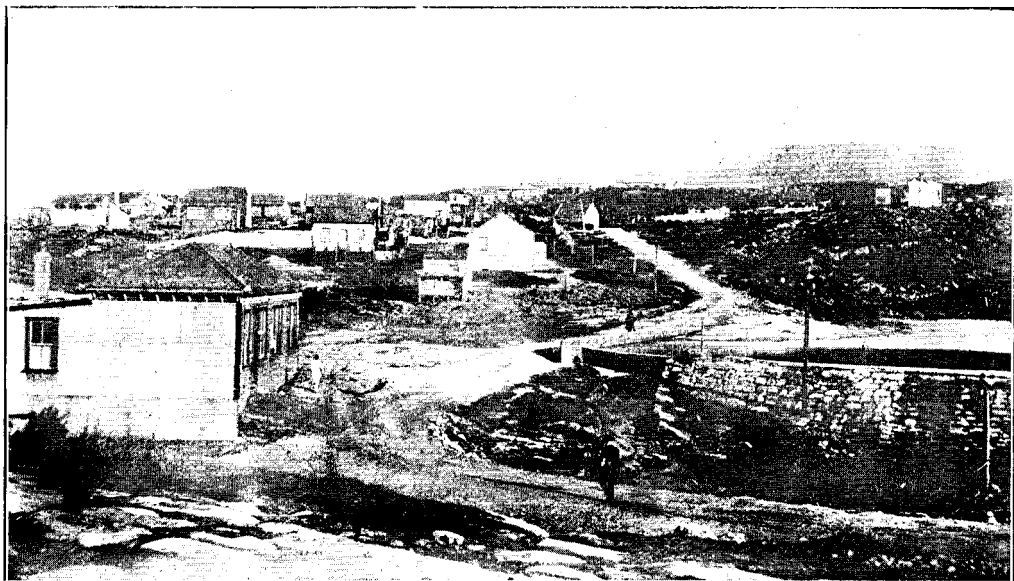
NO. 15.—SOME OF THE COTTAGES ERECTED BY THE MINING COMPANY AND SOLD TO THE WORKMEN.



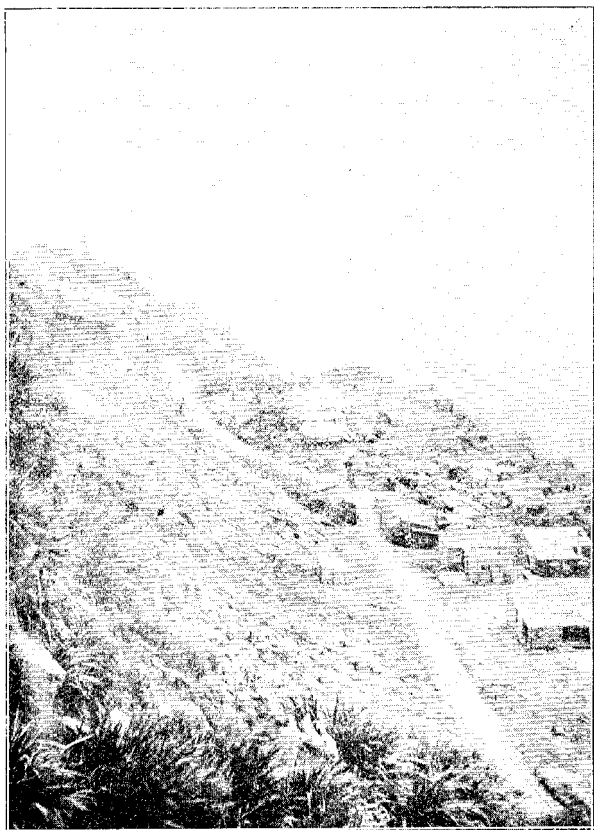
NO. 16. COLLECTION OF HUTS AND SHACKS ON WESTERN FACE OF DENNISTON HILL.



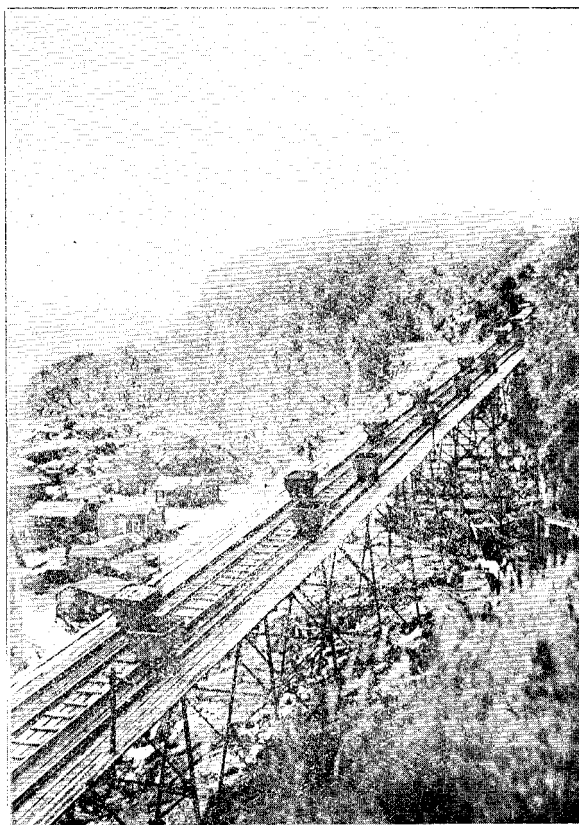
NO. 17. ANOTHER COLLECTION OF THE SAME.



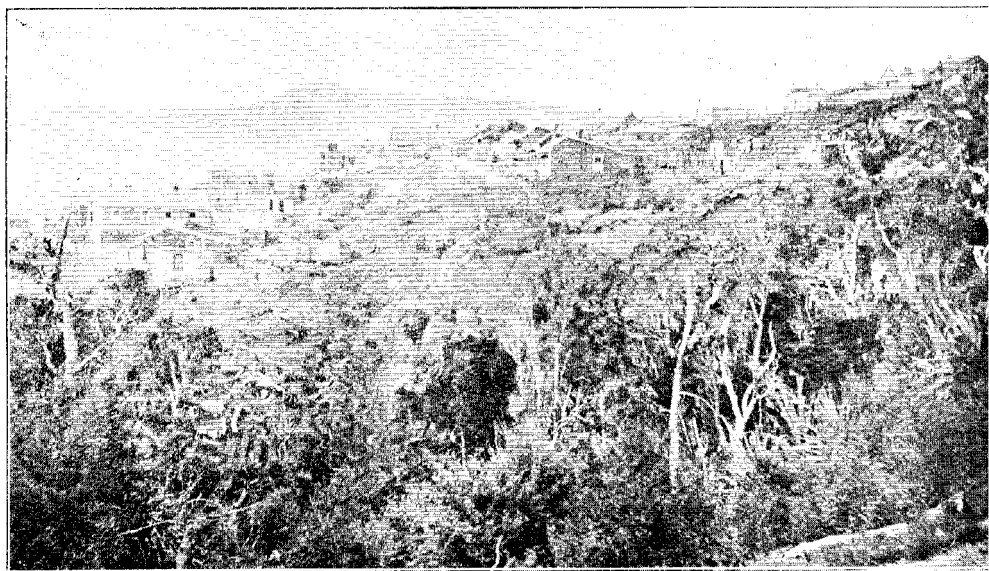
NO. 18. DENNISTON: ROAD ABOVE THE WESTERN FACE LEADING TOWARDS THE PLATEAU.



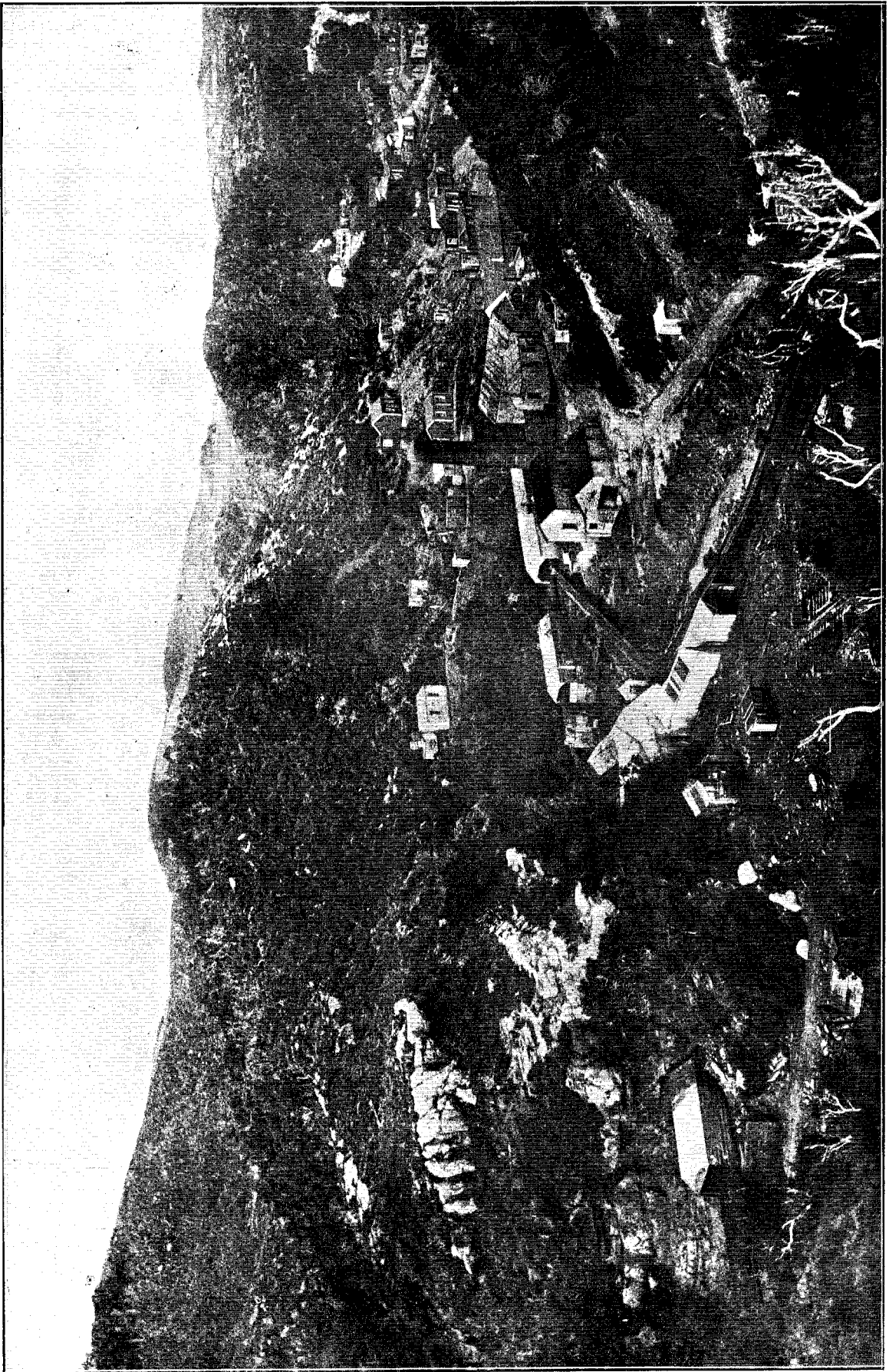
NO. 19. THE CAMP TO THE NORTH OF DENNISTON.



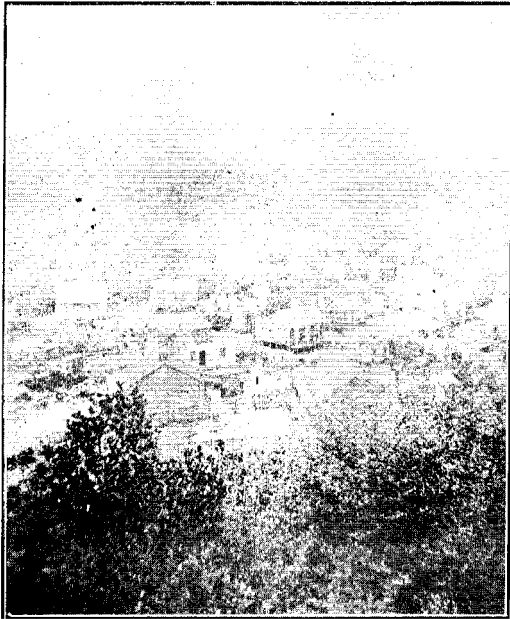
NO. 20. DENNISTON, LOOKING DOWN ON THE CAMP.



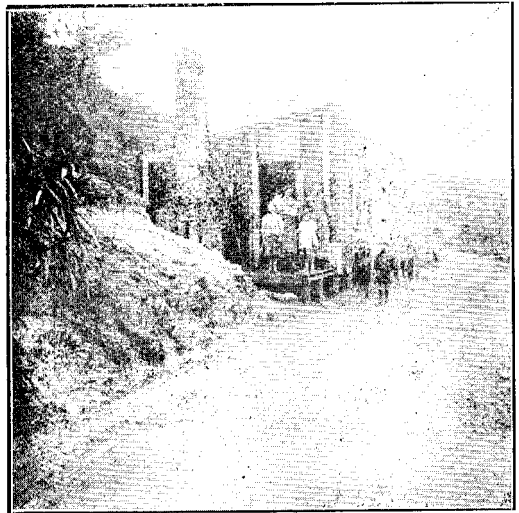
NO. 21. DENNISTON: NEARER VIEW OF WESTERN FACE.



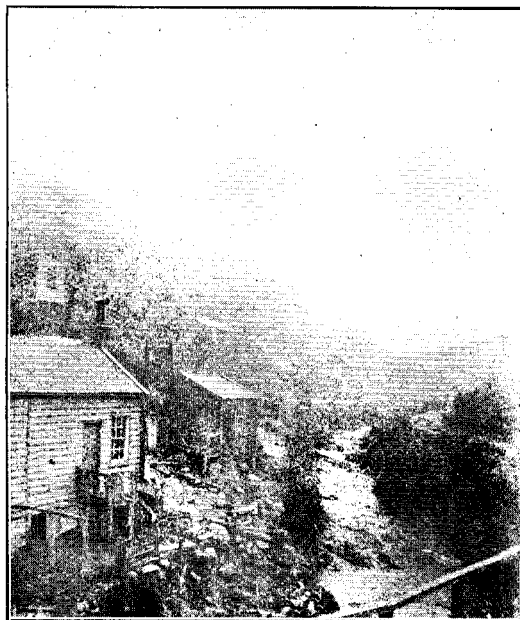
No. 22.—BURNETT'S FACE: GENERAL VIEW.



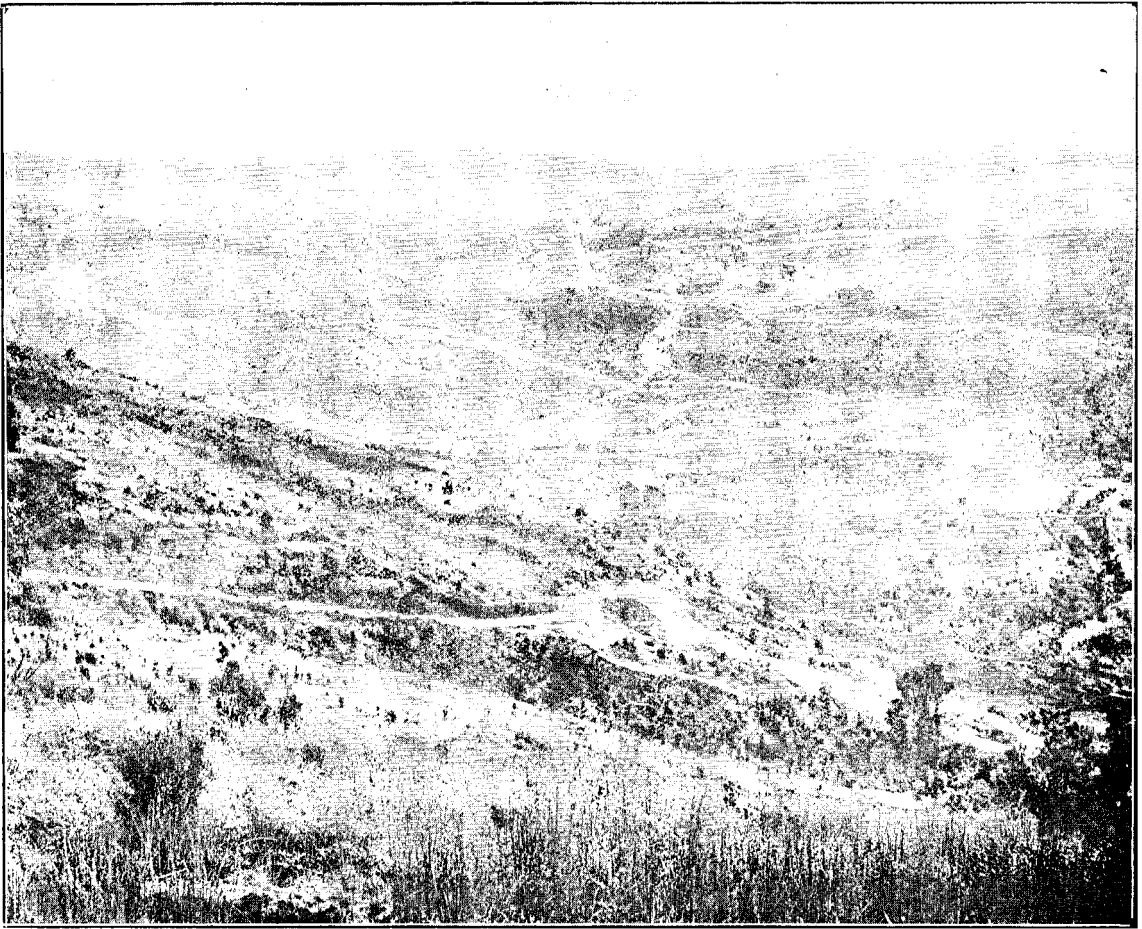
NO. 23. BURNETT'S FACE: COLLECTION OF HUTS AND HOUSES.



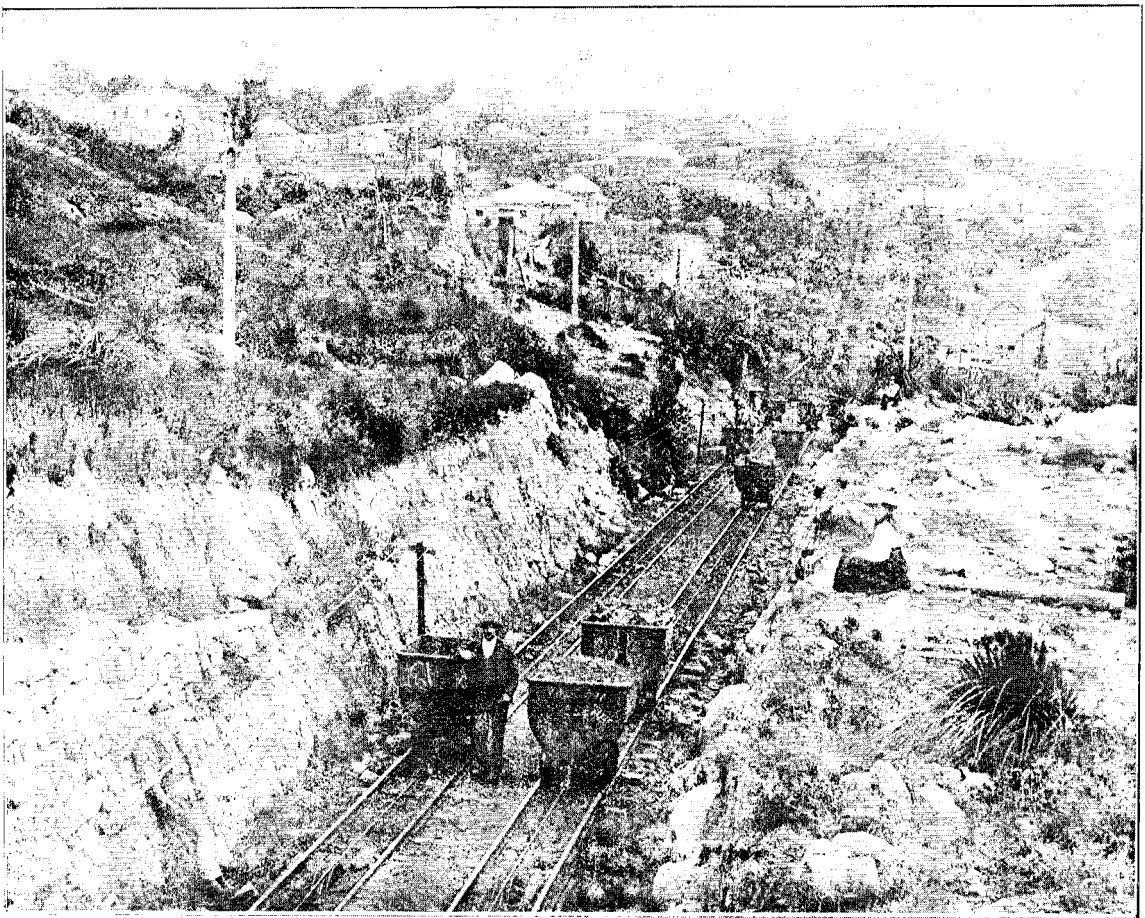
NO. 24. BURNETT'S FACE: A TYPICAL HUT.



NO. 25. BURNETT'S FACE: SOME OF THE HOMES.



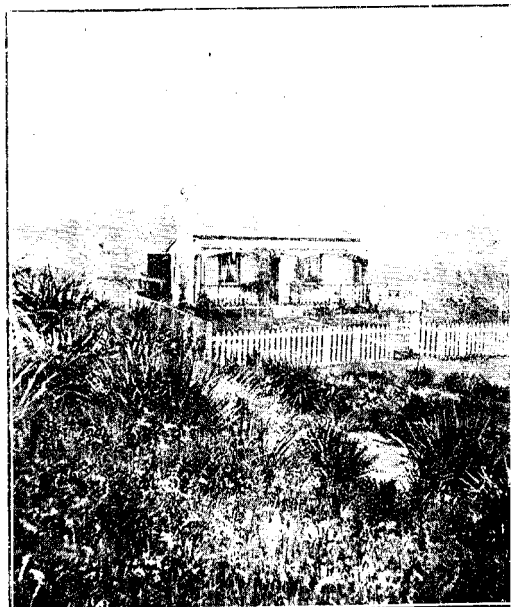
NO. 26. MILLERTON: BIRD'S-EYE VIEW.



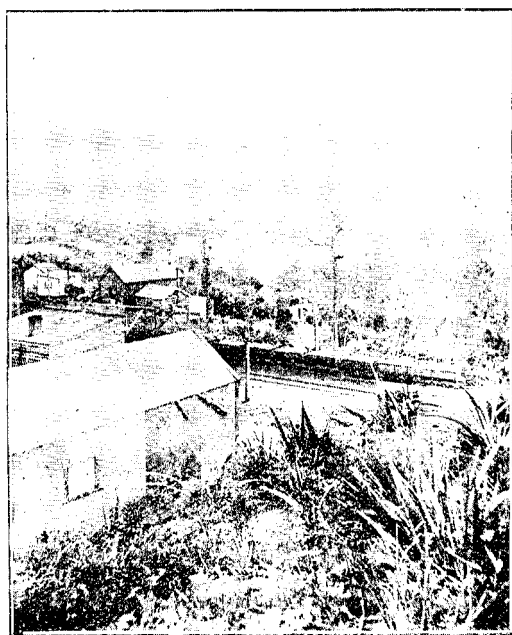
NO. 27. MILLERTON: HOUSES AT SIDE OF INCLINE.



NO. 28. STOCKTON: HOMES ERECTED BY THE COMPANY.
COST, \$205.



NO. 29. STOCKTON: WELL-KEPT HOME.



NO. 30. STOCKTON: GENERAL VIEW.