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**HIS MAJESTY'S STATIONERY OFFICE,
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REPORT
OF THE
ROYAL COMMISSION
ON THE
COAL INDUSTRY (1925)
WITH MINUTES OF EVIDENCE AND APPENDICES.

VOLUME 1.
REPORT.

Presented to Parliament by Command of His Majesty.

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The Minutes of Evidence will be published in Volume 2 and the Appendices in Volume 3.

ROYAL COMMISSION ON THE COAL INDUSTRY
(1925).

VOLUME 1.

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ROYAL WARRANT.

GEORGE R.I.

George the Fifth, by the Grace of God, of the United Kingdom of Great Britain and Ireland and of the British Dominions beyond the Seas King, Defender of the Faith, to

Our Right Trusty and Well-beloved Counsellor Sir Herbert Louis Samuel, Knight Grand Cross of Our Most Excellent Order of the British Empire ; and

Our Trusty and Well-beloved :

Sir Herbert Alexander Lawrence (commonly called the Honourable Sir Herbert Alexander Lawrence), Knight Commander of Our Most Honourable Order of the Bath, General (retired) of Our Land Forces ;

Sir William Henry Beveridge, Knight Commander of Our Most Honourable Order of the Bath ; and

Kenneth Lee, Esquire :

Greeting !

Whereas We have deemed it expedient that a Commission should forthwith issue to inquire into and report upon the economic position of the Coal Industry and the conditions affecting it and to make any recommendations for the improvement thereof ;

Now know ye, that We, reposing great trust and confidence in your knowledge and ability, have authorised and appointed, and do by these Presents authorise and appoint you, the said Sir Herbert Louis Samuel (Chairman), Sir Herbert Alexander Lawrence (commonly called the Honourable Sir Herbert Alexander Lawrence), Sir William Henry Beveridge and Kenneth Lee to be Our Commissioners for the purposes of the said inquiry :

And for the better effecting the purposes of this Our Commission, We do by these Presents give and grant unto you, or any three or more of you, full power to call before you such persons as you shall judge likely to afford you any information upon the subject of this Our Commission ; to call for information in writing and also to call for, have access to and examine all such books, documents, registers and records as may afford you the fullest information on the subject, and to inquire of and concerning the premises by all other lawful ways and means whatsoever :

And We do by these Presents authorise and empower you, or any one or more of you, to visit and personally inspect such places as you may deem it expedient so to inspect for the more effectual carrying out of the purposes aforesaid :

And We do by these Presents will and ordain that this Our Commission shall continue in full force and virtue, and that you, Our said Commissioners, or any three or more of you, may from time to time proceed in the execution thereof, and of every matter and thing therein contained, although the same be not continued from time to time by adjournment :

And We do further ordain that you, or any three or more of you, have liberty to report your proceedings under this Our Commission from time to time, if you shall judge it expedient so to do :

And Our further will and pleasure is that you do, with as little delay as possible, report to Us under your hands and seals, or under the hands and seals of any three or more of you, your opinion upon the matter herein submitted for your consideration.

Given at Our Court at *Balmoral*, the *fifth* day of *September*, one thousand nine hundred and twenty-five, in the sixteenth year of Our Reign.

By His Majesty's Command,
W. Joynson-Hicks.

ROYAL COMMISSION ON THE
COAL INDUSTRY (1925).

ROYAL COMMISSION ON THE COAL INDUSTRY
(1925).

(Appointed by Royal Warrant dated 5th September 1925.)

Terms of Reference.

To inquire into and report upon the economic position of the Coal Industry and the conditions affecting it and to make any recommendations for the improvement thereof.

Membership of Commission.

The Rt. Hon. Sir Herbert Louis Samuel, G.B.E. (*Chairman*).
General The Hon. Sir Herbert Alexander Lawrence, G.C.B.
Sir William Henry Beveridge, K.C.B.
Mr. Kenneth Lee, LL.D.

Assessors to the Commission.

The Rt. Hon. William Brace.
Mr. A. E. Cutforth, F.C.A.
Dr. Walcot Gibson, F.R.S.
Major H. M. Hudspeth, D.S.O., M.C.
Dr. C. H. Lander, D.Sc.

Secretary.

Mr. C. S. Hurst, O.B.E.

Assistant Secretary.

Mr. F. C. Starling.

Alphabetical List of Witnesses.

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Bailey, Mr. T. H. ..	Pioneer Companies	18th.
Baker, Mr. John ..	Miners' Federation of Great Britain	15th.
Balfour of Burleigh, Lord.	Family Endowment Society ..	28th.
Bevin, Mr. E. ..	Transport and General Workers' Union.	29th.
Brett, Mr. M. ..	Shipping Federation	25th.
Bury, Mr. E., M.Sc. ..	National Association of Coke and Bye-Product Plant Owners.	28th.
Bow, Mr. J. W. ..	British Coal Exporters' Federation	16th.
Carpenter, Dr. Charles, C.B.E., M.Inst.C.E.	Gas Companies Protection Association.	9th.
Clark, Sir W. H., K.C.S.I., C.M.G.	Comptroller General of the Department of Overseas Trade.	4th.
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Coates, Mr. D. W., C.B.E.	Coal Merchants' Federation of Great Britain.	13th and 14th.
Cockbaine, Mr. A. E.	Joint Parliamentary Committee of the Co-operative Congress.	30th.
Cooper, Mr. F. W. ..	(1) Coal Merchants' Federation of Great Britain and (2) Association of Private Owners of Railway Rolling Stock.	13th and 14th. 29th.
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Downing, Mr. (now Sir) S. E.	Mineral Owners' Joint Committee ..	26th.
Ford, Mr. E.	Great Western Railway	27th.
Forestier-Walker, Mr. C. E.	Mineral Owners' Joint Committee ..	26th.
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Gainford of Headlam, The Rt. Hon. Baron.	National Association of Coke and Bye-Product Plant Owners.	28th.
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Name of Witness.	Qualification of Witness or Interests represented.	Minutes of Evidence. Day.
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Hall, Mr. F.	Miners' Federation of Great Britain	24th and 25th.
Hann, Mr. E. L. ..	Institution of Mining Engineers ..	22nd and 23rd.
Hewitt, Mr. C. R. ..	Mineral Owners' Joint Committee ..	26th.
Hilton, Mr. J.	Ministry of Labour	3rd and 4th.
Hobkirk, Mr. D. T. ..	British Coal Exporters' Federation	16th.
Hodges, Mr. F.	Miners' International Federation ..	18th and 19th.
Holt, Mr. R. D.	Liverpool Steamship Owners' Association.	25th.
Jones, Mr. J.	Miners' Federation of Great Britain	33rd.
Larke, Sir W. J., K.B.E.	National Federation of Iron and Steel Manufacturers.	3rd.
Le Maistre, Mr. C., C.B.E.	British Engineering Standards Association.	3rd.
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Lessing, Dr. R.	Research Chemist	6th.
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Name of Witness.	Qualification of Witness or Interests represented.	Minutes of Evidence. Day.
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Rose, Mr. G.	National Council of Coal Traders ..	14th.
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Stewart, Mr. R. M. ..	British Coal Exporters' Federation	16th.
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Tawney, Mr. R. H. ..	Miners' Federation of Great Britain	33rd.
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Williams, Mr. Evan ..	Mining Association of Great Britain	31st and 32nd.
Wilson, Sir H. J., K.C.B., C.B.E.	Secretary to the Ministry of Labour	3rd and 4th.

N.B.—In the footnotes to the Report giving references to the Evidence the reference is either to the question on which the answer is based; thus—Gowers, Q. 456; or to the appropriate paragraph in the Memorandum of Evidence submitted by the Witness; thus—Gowers, para. 14.

ROYAL COMMISSION ON THE COAL
INDUSTRY (1925).

REPORT.

TO THE KING'S MOST EXCELLENT MAJESTY.

MAY IT PLEASE YOUR MAJESTY—

We were appointed on September 5th, 1925, as a Commission "to inquire into and report upon the economic position of the Coal Industry, and the conditions affecting it, and to make any recommendations for the improvement thereof."

INTRODUCTORY.

Several inquiries have been held in recent years into the condition of the industry or into particular questions relating to it. The evidence taken at those inquiries, and the reports presented, have been of much assistance to us, and have made it unnecessary to invite the evidence of as many witnesses as would otherwise have been needed. We have, however, held 33 public sittings for the taking of evidence, and have examined 76 witnesses. At those sittings we had the advantage of the attendance of representatives of the Mining Association of Great Britain and of the Miners' Federation of Great Britain, who further examined the witnesses, and whose lifelong experience of the industry, as mine-owners or as miners, enabled them to call attention to many points which otherwise might not have been fully appreciated.

We have been supplied with a great quantity of information on particular matters by the Government departments concerned; and with several special returns, collected for us from the collieries throughout the country, either directly or by the Mining Association, at an expenditure of much time and labour by the officials both of the Association and of the mines. Other organizations, representative of sections of the coal trade or of industries associated with it, have freely placed at our disposal all the information for which we asked, including in many cases the trading accounts of particular businesses, which we desired should be examined by our Accountant Assessor.

We also caused to be inspected on our behalf 42 mines, in various parts of the country, selected by the Miners' Federation as offering special grounds for complaint, on account of hindrances to output due to inefficient management or other causes. These inspections were made by members of the staff of Inspectors of Mines acting as our Assistant Commissioners; they were accompanied in each case by representatives of the owner and of the workmen.

The Commission itself visited 25 mines in Scotland, Lancashire, Yorkshire and South Wales, and inspected parts of the underground workings of several of these. We regret that the time at our disposal did not allow us to visit other coalfields also.

The State subsidy in aid of the mining industry was granted for the period ending on April 30th next. We have been aware that it was desirable that our Report should be presented in good time to allow the many questions that arise to receive consideration before that date. We have therefore pressed on with our inquiry with the utmost expedition. It would not have been possible, however, to have completed it within the time available—in view of the extent and the complexity of the subject—if we had not had the unstinted help of the Mines Department of the Board of Trade. The Department placed all its resources and information at our service; the assistance which it has given has been invaluable. We have also been greatly aided by the officers of several of the other Government Departments; and particularly by our able technical Assessors.

We desire to express our gratitude for the great assistance we have received from our Secretary, Mr. C. S. Hurst, and our Assistant Secretary, Mr. F. C. Starling. Their work has been difficult and laborious, and it has been most efficiently performed.

Since the coal industry, like any other, exists in order to supply a demand, we have thought it best to open our Report with a survey of the demand for coal, at home and abroad, of the changes in the demand, and of the causes of those changes. We then proceed to an examination of the extent of the national coal resources and their probable duration, of possible improvements in the methods of utilising coal, and of the requirements of research in connection with both the winning and the using of coal.

The Second Part of the Report deals with the organisation of the industry—the character of its units of production, the policy of nationalisation of the mines, the ownership of the royalties, the agencies for distributing the product, and the methods of conveyance.

The Third Part contains eleven chapters dealing with the various matters that affect the workmen and the employers, and their relations with one another.

In the last Part we turn to the existing situation, and offer suggestions as to the manner in which it may be met; and finally we present a general summary of our findings and recommendations.

In the Annex to this Report will be found certain statistical and other information which should be read in conjunction with it, together with an explanatory note on terms that are used, and on other matters. Additional material which has been collected is published in a separate volume of Appendices.

PART I.—DEMAND AND UTILISATION.

CHAPTER I. GENERAL STATEMENT.

The paramount importance of the coal mining industry in the economic and social life of this country is a commonplace, and it is unnecessary for us to dwell upon it. With the exception of agriculture, to which it is a close second, the industry employs more men than any other; not less than one-twelfth of our population is directly dependent on it. It is the foundation of our iron and steel, shipbuilding and engineering trades and, indeed, of our whole industrial life. The value of its product is in the neighbourhood of £250,000,000 a year. It provides one-tenth of our exports in value and about four-fifths of them in volume. By furnishing outward cargo for a large amount of shipping, it cheapens freights for the imports on which we depend for our vital needs.

In 1800 our output of coal was about ten million tons. Throughout the nineteenth century, and up to the outbreak of the war, the history of the industry was one of rapid and uninterrupted expansion both in output and in exports, culminating in the year 1913; when 287 million tons were raised and 98 million tons exported.*

That year, up to the present, marks the climax of the industry's prosperity. Essentially dependent as it is on its foreign markets, it was particularly susceptible to the disorganising influences of the war. For about five years it was under Government control; exports were limited in order to conserve the necessary quantities of coal for our own essential needs; export prices rose to enormous heights; markets were lost, and a sharp stimulus was given to the development of foreign coalfields and the use of substitutes. By 1920 output had fallen to 230 million tons and exports had been cut down to 43½ millions, or considerably less than half the pre-war rate. It was not until the advent of the trade depression at the close of that year that the approximation of the free export price to the controlled inland price made it possible to remove the restriction on exports. It was not until July, 1921, that the industry was free to set about the task of recovering the export trade that is vital to it. In the circumstances, as we shall show, the degree of success that has been attained is remarkable. But this is partly because, until a year and a half ago, it has been singularly favoured

* Inclusive of 21 million tons shipped as bunkers on foreign-going steamers and as coke and manufactured fuel.

by fortune. As was pointed out to us in evidence by Mr. Gowers, the Permanent Under Secretary for Mines,

“ ever since the end of 1920 the depression that then overtook the other heavy industries has been lying in wait for the coal-mining industry, but has been warded off by a series of accidents. For the last half of 1921 the industry was busy filling the gaps made by the three months stoppage in the summer of that year. In the first half of 1922 the depression actually laid its hand on the coal mining industry, but the great strike in the United States of America came to our rescue. After that came the French occupation of the Ruhr, and it is only during the last 15 months that the industry has not been helped by the temporary cessation of some normal sources of coal supplies. Without this its present difficulties could hardly have failed to come upon it four years earlier.”*

For this reason it is difficult to select any post-war period that we can say with confidence is typical of post-war conditions, and the position has been further complicated by the fact that there has recently been some recovery in our export trade at the lower prices that followed the grant of the subsidy. Whether we take the year 1924, however (which opened while the stimulus of the Ruhr occupation still had its effect and which ended in depression), or the year 1925 (which opened in depression and closed with a subsidy-fed revival) we are led by a comparison with pre-war conditions† to the same general conclusions.

Foreign Demand.

The material figures for a comparison of the state of the industry before the war and in the last two years are as follows :—

	1909-13	1924	1925
		<i>million tons</i>	
Output of coal	269·59	267·12	244·42
Coal exported	88·37	81·75	68·97
Coal available for home consumption	181·22	185·37	175·45

These figures make clear—what is indeed notorious—that it is the export trade rather than the home trade that is the seat of our present troubles. We will make a brief analysis later of the causes that account for the change in the home demand, and also of the position of the bunker trade, but we will first examine in greater detail the more important question of the contraction in foreign trade. How far are we to regard it as a permanent change, to which the industry must adapt itself as best it can? How far can the position be retrieved by lower prices or other means?

* Gowers, para. 16.

† Here, and throughout our Report, we shall (whenever possible) regard the average of the five years 1909-13 as the proper standard of comparison for pre-war conditions. Single years are not a safe basis for statistical comparison, and 1913 was a year of exceptional activity.

Have we lost trade because coal is supplied from other sources to consumers whom we used to supply? If so, can we hope to recapture the markets? Or have we lost it because less heat and power are being consumed, owing either to industrial depression or to political upheaval? If so, may we look forward to an improvement when these temporary causes pass away? Or again, have we lost it, not because less heat and power are being consumed, but because they are supplied from other sources than coal? If so, must we regard this as a permanent loss?*

The answers to these questions cannot be precise. But we will endeavour to set out concisely the relevant facts that emerge from a study of the evidence laid before us.

The following table analyses our loss of markets in the countries that were our principal customers before the war. (It is on a pre-war territorial basis.)

Table 1.

Country.	British exports in 1909-13 (annual average).	Difference in	
		1924.	1925.
France	10,836,700	+3,890,000	- 411,100
Scandinavia and Denmark	9,917,900	+1,672,800	-1,111,600
Italy	9,483,400	-2,409,000	-2,244,600
Germany	9,039,400	-1,864,500	-4,815,800
South America†	6,751,000	-2,127,800	-2,217,100
Russia, etc.	4,110,500	-2,767,000	-3,184,200
Egypt	2,952,100	-1,088,700	- 952,400
Spain	2,527,400	- 817,300	- 550,200
Netherlands	2,186,100	+ 608,800	- 638,100
Belgium	1,707,000	+1,719,400	+ 917,500
Net loss on above markets	.. ..	-3,185,300	-15,207,600

† Including the Argentine, Uruguay, Brazil and Chile.

The most striking reductions are in the exports to Germany and Russia. It will be seen from the figures given in the Survey that in both these countries the reduction is more than accounted for by a reduction in consumption. Germany is estimated to be consuming some six million tons less annually than in the pre-war period; Russia, 13 million tons less. But the causes of the changes are very different. The cause in Russia is economic dislocation, and it may be that at some future date she will again become an important market for our coal. In Germany the causes are more complex, but the most important single reason for her reduced

* The facts and figures on which the following paragraphs are based will be found in the detailed "Survey of Foreign Production and Markets," which is printed in Section 2 of the Annex.

consumption of coal is undoubtedly her increased production of lignite (used for generating electricity, for the nitrate and other industries and for domestic purposes) which is equivalent to an addition to her resources of at least another 15 million tons of bituminous coal. We were also told that greater economies in the industrial use of coal have resulted in a saving of about 10 per cent.*, and it appears that a substantial advance has been made in the use of water-power for the generation of electricity.

Next in order of importance amongst the lessened markets comes Italy. Here there is no question of reduced consumption. It is a remarkable fact that, in spite of an intensive development of hydro-electricity, the total amount of coal imported by Italy has not decreased. The truth is that, whereas before the war 90 per cent. of this was British coal, only about 63 per cent. of it is so to-day. The gap is filled almost entirely by Germany, who before the war supplied Italy with less than a million tons of coal, but now sends two or three times as much. To what extent responsibility for this must be placed on the Reparations provisions of the Treaty of Versailles is a question on which witnesses before us differed. The opinion of Mr. Leith Ross, Deputy Controller of Finance in the Treasury, was that: "Viewing the situation as a whole, it is difficult to maintain that the Reparation deliveries have directly affected the volume of the British export trade, the depression in which must be attributed to other causes. The most that can be said is that Reparation deliveries have to some extent affected the direction of our coal exports. This applies especially to the Italian market."† In reply to a question whether it was his opinion that, if there had been no Reparation Clause in the Treaty at all, the British coal trade, in volume, if not in direction, would be much the same as it is now, he said, "I think it would be much the same, except in the case of Italy. Exports to Italy might have been slightly higher than they are at present."‡

The Mining Association shared the view that the effect of Reparation coal was only a matter of readjustment, not of loss, but the Coal Exporters' Federation considered that, in practice, this readjustment could not be made without loss.

Next in order of importance is the South American market, where our loss amounts to between two and two and a half million tons. In the pre-war period upwards of seven million tons were exported annually to the Atlantic States of South America. Ninety-three per cent. came from this country and 7 per cent. from the United States. At the present time these States take 5½ million tons, of which our share is 85 per cent. There has been a small increase in the production of coal in Brazil since the pre-war period. But the decrease in our exports to these

* Leith Ross, Q. 2045.

† Leith Ross, para. 9.

‡ Leith Ross, Q. 1965.

markets (apart from the fact that we have lost ground slightly to the United States) is chiefly accounted for by the substitution of oil fuel. There is now, however, a reaction; it appears, for example, from a table* given in the Annex that, although for six years up to June, 1924, the proportion of coal used by the Argentine railways steadily diminished and the proportion of oil increased, the process is now being reversed.

The position of France, our principal customer, is interesting. The destruction of the mines in her northern coalfield has led to their re-equipment with modern plant and machinery, and her production is now three million tons a year more than in the pre-war period. She uses three times as much hydro-electricity as she did then. Yet she imports six million tons more coal, for her consumption has increased by nearly ten millions. France, therefore, like Italy (and, as we shall see, Scandinavia), affords confirmation of the view expressed to us by more than one witness, that the development of water-power, if it brings with it increased industrial activity, need not necessarily lead to a diminished consumption of coal. The British share of her imports is, however, (in 1925), rather less than in the pre-war period, when it was 45 per cent. of the whole. In France, it appears, our loss is due not to reduced consumption but to competition by Germany. The possible effect of reparations has already been discussed.

It is not necessary to refer in detail to the other countries included in the table given above. Full particulars will be found in the Annex. Spain has developed her own coalfield, which holds its own with difficulty, and with the help of a tariff against our cheaper production. In Holland the output of coal (now seven million tons) has more than quadrupled. In Egypt the decline in our exports (about a million tons) is attributable chiefly to the substitution of oil for bunker coal. The present industrial prosperity of Belgium leads to her taking more coal from us than before the war, notwithstanding that she has developed an important new coalfield, which is already producing over a million tons a year. Scandinavia and Denmark, in spite of a considerable development of water-power, imported $2\frac{1}{2}$ million tons more in 1924 than in the pre-war period, and a million tons more in 1925. In the former year we secured the bulk of the increased imports, but in the latter we lost ground heavily to foreign competition.

From this short review of the position of Great Britain's customers we will turn to consider briefly the position of her competitors, almost all of whom, like her, are undergoing a period of depression. The principal exporting country after Great Britain is now, as before the war, Germany, in spite of the loss of coalfields producing $48\frac{1}{2}$ million tons (in 1913) in the Saar, Alsace-Lorraine and Polish Upper Silesia. Her exports, including reparation coal, are now at the rate of about 35 million tons a year. Her principal markets before

* Table 26, p. 258.

the war were Austria-Hungary, Holland, Belgium, France, Switzerland and Russia. At the present time the territories formerly comprised in Austria-Hungary consume about nine million tons a year less than they did before the war, and the Russian market is practically closed. On the other hand, as we have seen, the development of lignite has, in effect, added the equivalent of some 15 million tons of coal to Germany's production. We were informed, moreover, that the present output of the Ruhr coalfield (112 millions) has been estimated to be 30 to 40 per cent. below its potential capacity.* In these circumstances it is natural that she should seek new outlets for her surplus coal and, as has been shown, she has found them to some extent in France, Italy and Scandinavia.

Next in order of importance is the United States of America. But of her colossal output of 500-600 million tons annually, only about 5 per cent. is exported. By far the greater part of this goes to Canada and is not in competition with British coal. The physical conditions of the American coalfields are much easier than those of any European coalfield, and her cost of production is low. But there is a long railway haul from the coalfields to the sea, and she is not in normal times a serious competitor in markets in which we are interested, except in South America, although some American coal always finds its way to Europe and the Mediterranean. The volume of her exports to these countries responds very quickly to any marked increase in the British price.

Since the transfer from Germany of the mines in Polish Upper Silesia, the fourth place in the world's exporting countries is held by Poland. Her exports are at the rate of about 11 million tons a year. Her markets are in the neighbouring central European states, and she is not at present a serious rival in the British export trade. It is true that since her natural market in Germany has been closed, she has been trying to find fresh outlets in places (*e.g.*, Scandinavia and Italy) that we normally supply. But it is not likely that it will prove economically possible for her to gain a permanent footing in these countries, though we may suffer indirectly from her increased exports elsewhere.

The other principal exporting countries of the world—Japan, South Africa and Australia—supply Australasian and far Eastern markets that had already been practically lost to us before the war. The only other European country that might come into competition with us is Russia, where efforts have recently been made to find a market in Italy, Greece and Egypt. But her production is still a long way below the pre-war rate.

The general conclusion to be drawn, therefore, seems to be that while Germany has gained some ground from us in France and Italy, and more recently in Scandinavia, and while we have lost

* *owers*, para. 20.

markets elsewhere by the impoverishment of our former customers or the use of substitute fuels, the causes of the depression in the British coal industry must be regarded in a large measure as general causes affecting almost all European coal-producing countries. It is true that, as compared with the pre-war period, the production of British coal has remained at the best stationary, while the production of coal elsewhere has increased from rather over 800 million tons to more than 900 million tons. But this is largely accounted for by increased production in countries which are not in serious competition with us; the United States alone contribute 53 million tons of it. If the matter is looked at in another light, our position may be summed up thus. In the pre-war period the annual average quantity of coal available for consumption in countries other than Great Britain—that is to say, the coal produced in those countries together with the coal imported into them from Great Britain—was 899 million tons. In 1924 the corresponding figure was 978 million tons, and in 1925 approximately 993 million tons. Our share in the world's consumption outside Great Britain in 1909-13 amounted to 9·8 per cent.; it had fallen to 8·4 per cent. in 1924, and to about 7·0 per cent. in 1925.

There is no doubt that the fluctuations in the export trade since the war have been partly caused by the unprecedented instability of the currencies of Europe, whether in countries which are markets for British coal, or in those which compete against us in production. Nor could we expect to escape a temporary ill-effect upon all branches of our export trade at the time of the restoration of our own currency to a gold basis. But it may be believed that this effect has now spent itself. With the stabilisation of the currency not only in Great Britain, but also in Germany, Belgium and many other countries—the United States never having departed from the gold standard—this factor has now ceased to be of primary importance.

Before leaving the subject of the export trade we think it important to make some reference to the recovery that has taken place in recent months. The following table, which compares the last quarter of 1925 with the June quarter, analyses geographically the difference in the volume of our exports and shows also the manner in which the fall in prices which had been going on steadily for some months before August was accentuated by the grant of the subsidy. With the expansion of trade, the fall has now been checked.

Table 2.

Quantities and Average Declared Value per ton f.o.b of coal exported to the undermentioned destinations during the June and December Quarters, 1925.

Destination.	June Quarter, 1925.		December Quarter, 1925.	
	Quantity exported.	Average Declared Value per ton f.o.b.	Quantity exported.	Average Declared Value per ton f.o.b.
	<i>Tons.</i>	<i>s. d.</i>	<i>Tons.</i>	<i>s. d.</i>
Russia	4,001	25 0	45,473	17 7
Sweden, Norway and Denmark	1,685,129	17 6	2,142,461	16 3
Germany	904,638	16 2	1,431,951	14 4
Holland	363,134	18 2	448,245	16 1
Belgium	614,193	16 8	479,558	15 0
France	2,550,384	21 0	2,445,444	17 7
Spain	464,594	22 5	406,593	20 1
Italy	1,801,358	20 9	1,664,951	18 4
Egypt	556,322	22 6	390,141	19 8
South America (Chile, Brazil, Uruguay and Argentina) ..	1,046,046	23 11	1,119,012	21 6
All destinations ..	12,746,126	20 7	13,252,303	18 5

It is of course quite impossible to say to what extent such recovery in trade as has taken place is the result of the reduced prices and to what extent it might have occurred without them. But it is perhaps significant that (ignoring the increased American demand owing to the strike there) the increase in the export trade is most marked in the places such as Germany, Scandinavia, and, to a lesser extent, South America, where competition is keenest, although it is true that in two other countries, France and Italy, where competition also is keen (but which receive Reparation coal), the volume of export at the lower prices is not substantially different from that at the higher prices, and is indeed slightly less.

Home Demand.

The quantity of coal available for home consumption was 170·8 million tons in 1925, 180·4 million tons in 1924 and 175 million tons annually in the pre-war period.* The consumption per head of the population was 78 cwt. in 1925, 83 cwt. in 1924 and had been 86 cwt. in 1909-13. These are not exact figures, as no precise information is available as to the position of stocks at the beginning and end of each period. But they are likely to be approximately correct.

* These figures relate to Great Britain only: the figures given on page 4 relate to Great Britain and Ireland.

The following analysis shows the amount of coal consumed at home for various purposes in 1913, 1923 and 1924. An analysis for 1925 is not yet available. It will be seen that little variations are shown under the greater number of heads if 1924 is compared with 1913, but such variations as there are present features of interest.

Table 3.

Consumer.	1913.	1923.	1924.	1913.	1923.	1924.
	Million Tons.			Percentage Proportion of Total.		
				%	%	%
Domestic.. ..	33·5	33·50	33·75	18·2	19·9	18·7
Gas Works	16·7*	15·37	16·66	9·1	9·1	9·2
Electricity Works ..	4·9	7·24	7·75	2·7	4·3	4·3
Railways (for Locomotive Use).	13·2	13·33	13·51	7·2	7·9	7·5
Bunkers for Coastwise Vessels.	1·9	1·16	1·27	1·0	0·7	0·7
Coal Mines	18·0	16·85	16·58	9·8	10·0	9·2
Miners' Coal	5·8	6·47	6·57	3·2	3·8	3·7
Pig Iron Manufacture ..	21·2	14·42	14·04	11·5	8·5	7·8
General Manufactures and all other purposes.	68·6	60·42	70·23	37·3	35·8	38·9
Total	183·8	168·76	180·36	100·0	100·0	100·0

* Approximate figure only.

Electricity.—This shows an increased consumption (amounting to nearly 3 million tons) in spite of the fact that the average consumption of coal per kilowatt hour is steadily decreasing. It has already fallen from 3·47 lbs. in 1918 to 2·53 lbs. in 1925, and we are informed that the limit of economy has not yet been reached.

The use of electricity in Great Britain is at present at the rate of 220 units per head per annum. This is low compared with many other countries, notably the United States of America, where the figure in some States is as high as 500. According to estimates submitted to us by Sir John Snell,† the Chairman of the Electricity Commission, the tonnage of coal, now nearly eight millions, consumed annually for the purpose of generating electricity, may be expected to be rather more than doubled in the next fifteen years. But it is of course impossible to make any precise estimate of the amount of coal that this extra electrical power will displace.

The possibility of further electrification of British railway systems is not, we are informed, a consideration of immediate practical importance. It is true that the total amount of coal required

† Snell, para. 11.

to run the railways by electricity would be only half, for an equal service, that required by steam. But Sir Ralph Wedgwood, who appeared before us on behalf of the railway companies, did not think that main line electrification in the next ten years would be sufficiently extensive to affect the demand for coal. In the electrification of the suburban lines now being carried out, the intention is to increase the traffic by 50 or 100 per cent., so that any heavy reduction in coal consumption is improbable.*

Electricity generated by water-power is not likely to be a serious competitor of coal in this country. It is true that we have heard evidence relating to a scheme to utilise the energy of the tides of the Severn estuary, and that such a scheme might effect an annual saving of over a million tons of coal; but the local conditions are stated to be, within these islands, unique, so that even if the Severn scheme be carried into effect we need not anticipate that it will prove the precursor of any similar development of water-power at home on an extensive scale.†

Pig Iron.—The most significant feature in the Table is the reduction in the amount of coal used for the manufacture of pig iron. Nor do the figures given in the Table show the full picture. If the Iron and Steel trade were working up to its greatly increased capacity, its annual consumption of coal would be about 37 million tons. In 1925 it was only 22 million tons. Here, as in shipbuilding and engineering, a great expansion to meet the demands of the war has been followed by a profound depression. It is only to the revival of these heavy industries that the Coal Mining Industry can look for any substantial increase in the home demand for coal.

Gas.—In spite of a greatly increased consumption of gas, the amount of coal used for making it is approximately the same. This is, of course, the result of improvements in technique. Not only has the average yield of gas from a ton of coal been increased from about 65 therms to 72 therms during the last 20 years, but also an increasing proportion of gas is now "carburetted water gas" for the production of which coke is used, enriched with oil.‡

Domestic Coal.—Domestic coal has remained stationary in spite of an increased population of three millions. This is a phenomenon that is likely to continue, for it is doubtless due mainly to greater economy, to central heating and improved grates, and an increased use of gas as a substitute.

Colliery Consumption.—It is satisfactory to note that the amount of coal used at the coal mines themselves has decreased by a million and a half tons a year.

General Industrial Consumption.—No useful inference can be drawn from the figures under this residuary heading, which may be vitiated by differences in the amounts of stocks. It may, however,

* Wedgwood, Q. 14,045

† Snell, Q. 4294.

‡ Milne Watson, Q. 2978 and 2984.

be observed that here, as in the electrical and gas industries, science will no doubt continue to show us progressively ways of economising in the consumption of coal. For instance, the present average efficiency of steam raising is estimated at 65 per cent., and we are informed that there is no reason why 75 per cent. should not be attained in general practice. It may, however, safely be assumed that such economies as these are not in the long run to the detriment of the Coal Mining Industry; on the contrary they are likely to be more than off-set by the expansion of industry to which they lead.

Bunker Demand.

The quantity of coal used as bunkers by vessels engaged in the foreign trade averaged 19·6 million tons annually in the pre-war period, 17·5 millions in 1924 and 16·2 millions in 1925. This serious decrease is attributable partly to the general fall in our foreign coal trade (for every million tons of coal sold abroad about 270,000 tons are needed as bunkers by the ships that convey it) and partly to the use of oil both for steam raising and for internal combustion engines.

The exact quantity of fuel oil used in the United Kingdom before the war is not known; but in 1913 it probably did not exceed 500,000 tons for all purposes. In 1924 the amount supplied to vessels engaged in the foreign trade alone was over 1,000,000 tons. We may estimate the extent of the change by comparing the gross tonnage of vessels registered at Lloyds as being fitted for burning oil, which rose from 1½ millions before the war to 20½ millions in 1925. Meanwhile, the corresponding figure for coal-burning vessels fell from 44 to 42 millions. We may add that the tonnage of motor ships building in the world at the beginning of 1926 almost equalled that of the steam tonnage under construction.

In drawing deductions from these figures it should not be forgotten that many steamers are constructed to burn either coal or oil alternatively, and will change from one to the other according to their comparative prices from time to time.

Conclusions.

The conclusions to which the foregoing surveys lead us are as follows:—

Export Trade.—(1) The depression in the British coal export trade is, in the main, part of a general depression, affecting almost all European coal-producing countries: an excess of supply over demand caused partly by the impoverishment of customers, partly by the development of new coalfields, and partly by the increased use of substitutes.

(2) To a lesser extent it is due to the competition of foreign countries with us in the coal export trade, especially that of Germany.

(3) The extent to which the German export trade has been assisted by the Reparations provisions of the Treaty of Versailles is obscure, and the opinions of our witnesses differ. We can only express our conclusion that the British coal trade in general does not regard them as a serious danger.

(4) The substantial fall in British export prices during the latter part of 1925 has been followed by an appreciable recovery of the position in some, though not all, of the competitive markets; and the fall in price has been checked by a restoration of the balance between demand and supply.

Bunker Trade.—(5) In so far as the decrease in coal used as foreign bunkers is the natural consequence of the decrease in the export trade, it is obvious the quantity will automatically increase if the export trade increases. But in so far as it is due to the use of oil instead of coal, the reduction is likely to be progressive, especially if any change in the present relative positions of coal and oil as regards price takes place to the disadvantage of coal.

Home Trade.—(6) No substantial recovery in the home trade can be looked for except from a recovery of the heavy industries.

CHAPTER II—THE NATIONAL COAL RESOURCES.

The Coal Reserves of the United Kingdom.

A Royal Commission was appointed in 1866 for the purpose of investigating, *inter alia*, "The probable quantity of coal contained in the coalfields of the United Kingdom, and the quantity of such coal which may be reasonably expected to be available for use." It reported (in 1871) that the estimated reserves of the coal resources of the British Isles, in seams of 1 ft. in thickness and upwards, down to a depth of 4,000 ft. were 146,480 million tons; of this, 90,207 millions was the probable quantity in the ascertained coalfields, and 56,273 millions the probable quantity concealed under the newer formations, *i.e.*, unproved coalfields. These estimates were arrived at after making generous deductions for loss in working and other contingencies, and took no account of the probable existence of coal in the South of England.

Based on the then annual production of 115 million tons, the Commission calculated that the coal resources were sufficient to last for 1,273 years.

These estimates were revised by the Royal Commission on Coal Supplies which reported in January, 1905. Accepting the same data as to possible depth of working, thickness of seams, and loss in exploitation, as those previously adopted, the second Commission arrived at the following results:—

Available resources of proved coalfields	.. .. .	100,914 million tons.
Available resources of unproved coalfields	.. .. .	39,484 " "
Total	.. .. .	140,398 " "

It will be seen that that Commission adopted a much more conservative view of the possible productivity of the concealed coalfields than that of its predecessor. On the other hand it felt justified, by reason partly of more accurate knowledge of the coal seams, and partly of discoveries in other directions, in basing the reserves of the proved coalfields at an estimate 10,707 million tons in excess of that of the Commission of 1871, notwithstanding the fact that upwards of 5,694 million tons had been produced in the interval.

The Commission of 1905 declined to prophesy as to the probable duration of the nation's coal reserves, having regard to the very speculative data upon which such an estimate could alone be based.

The Coal Conservation Committee, which was appointed in July, 1916, and reported in January, 1918, emphasised the importance of the economical consumption of the nation's coal reserves, "in view of the fact that the coal available in the United

Kingdom is not unlimited." The Committee, however, did not attempt to form an independent estimate of such reserves, but accepted those of the two Commissions to which reference had already been made, and of authorities on the subject whose estimates had subsequently been published.

The first of these was Dr. (now Sir Aubrey) Strahan, who was a member of the Committee, and who, as Director of the Geological Survey, had issued a report on the coal resources of the world for the International Geological Congress of 1913. In that report Dr. Strahan modified the estimates of the Royal Commission of 1905 in accordance with the new data furnished by the explorations during the interval of eight years. For example, his estimate included for the first time the newly discovered coalfield of Kent, to which Dr. Strahan ascribed reserves of 2,000 million tons; and it took into account the 20th century development of the East Midland Coalfields, the eastern extension of which justified an addition of 13,500 million tons to the reserves estimated by the Royal Commission.

Dr. Strahan summarised his figures as follows:—

Actual reserves	133,117 million tons.
Probable and possible reserves..	45,610 " "
	178,727 " "
Total	178,727 " "

These figures, like the preceding ones, related to coal in seams of 1 foot in thickness or over, and lying at a depth not exceeding 4,000 ft. from the surface.

The second estimate quoted by the Committee was that of Professor H. S. Jevons, published in his work, "The British Coal Trade," in 1915, in which he arrived at the following results:—

Actual reserves	136,000 million tons.
Probable and possible reserves..	61,000 " "
	197,000 " "
Total	197,000 " "

The hypothesis adopted by Professor Jevons is almost identical with that of Dr. Strahan, the excess in the later estimate being accounted for largely by differing views as to the probable limits of the East Midland concealed coalfield, and of the reserves in Kent, and also by the inclusion by Professor Jevons of a purely speculative figure of 15,000 million tons as representing possible deposits of coal in totally unexplored areas.

It is noteworthy that, notwithstanding the continued exploration of the nation's coal deposits, with one exception (and that due to the very conservative attitude adopted by the investigator as to the probable dimensions of the concealed fields), each successive estimate of the available reserves remaining is a considerable advance on its predecessor.

This is made clear in the following table :—

Table 4.

Authority and Date of Estimate.	Estimated Reserves.	Quantity since extracted.*	Reserves still intact at 31st Dec. 1925 on basis of Estimate.
	Millions of Tons.		
First Royal Commission, 1871	146,480	11,953	134,527
Second Royal Commission, 1905	140,398	6,147	134,251
Dr. Strahan, 1912	178,727	4,330	174,397
Professor H. S. Jevons, 1915	197,000	2,645	194,355

* Excluding Ireland for the years 1922-25, both inclusive.

Recommendations resulting from previous Inquiries.

(1) Royal Commission on Coal Supplies of 1901-5.

Notwithstanding the reassuring conclusions which had been reached by the Commission of 1871 as to the potential reserves of British coal, there was a tendency on the part of scientific thinkers towards the close of the 19th century to take a pessimistic view of the extent and possible duration of the nation's mineral wealth. An opposite view was taken by men of practical mining experience, and the question was referred in 1901 to the second Royal Commission, with terms of reference wider than those of its predecessor.

The Commission sat for over three years and reported in 1905.

As we have seen, it substantially confirmed the estimates of the previous Commission, which had indicated that there was no cause for apprehension as to the exhaustion of our mineral wealth for many generations to come. The Commission arrived at a number of conclusions directed towards securing greater efficiency in the exploitation and preparation of coal for sale, its more efficient consumption, and the substitution for coal of other sources of power in appropriate circumstances. It expressed also the definite view that, owing to physical considerations, the then rate of increase in output (at that time about 4 million tons per annum) could not long continue, and added "there seems no present necessity to restrict artificially the export of coal in order to conserve it for our home supply."

The expression of this opinion inspired an immediate demand for the abolition of the coal export tax of 1s. per ton, which had been imposed in 1901, and which exporters maintained was responsible for a contraction of the foreign market. The Commission itself had accepted this contention. The tax was eventually repealed in November, 1906.

(2) *The Coal Conservation Committee, 1916-18.*

This Committee was appointed in July, 1916, as a subsidiary to the Reconstruction Committee. On the establishment of the Ministry of Reconstruction it became a Committee of that Department.

Its purpose was to consider and to advise :—

- (1) What improvements can be effected in the present methods of mining coal with a view to prevent loss of coal in working and to minimise cost of production.
- (2) What improvements can be effected in the present methods of using coal for the production of power, light and heat, and of recovering by-products, with a view to ensure the greatest possible economy in production and the most advantageous use of the coal substance.
- (3) Whether with a view to maintaining our industrial and commercial position it is desirable that any steps should be taken in the near future, and if so, what steps, to secure the development of new coalfields or extension of coalfields already being worked.

The Committee appointed five sub-committees, designated respectively Mining, Power Generation and Transmission, Metallurgical, Carbonisation, and Geological, and their several reports were embodied in the Final Report of the Committee, which was presented in January, 1918

The Mining Sub-Committee issued two reports. In the first, they recommended the establishment of a separate Ministry of Mines.

In the second, they recommended that additional powers should be vested in the proposed Ministry to take all necessary steps for the conservation of coal. In particular, it should have statutory authority to eliminate, so far as was practicable, the waste and loss, which the Committee found arose in the following circumstances :—Excessive consumption under colliery boilers, small coal cast back underground, inefficient working of seams of abnormal thickness, loss due to bord and pillar mode of working, barriers and coal left for support, waterlogging, loss of top and bottom coal, uneconomical order of working, and coal permanently lost for want of title, by reason of the demand by the owner of unreasonable terms or for other reasons.

(3) *The Acquisition and Valuation of Land Committee.*

In its Third Report, dealing with Mines and Minerals, 1919. Committee also proposed the establishment of a Mines and Minerals Department, and made a number of important recommendations. To prevent loss of minerals due to causes such as those which the Coal Conservation Committee had called attention to, the Department proposed to recommend, amongst other things, that statutory provision should be made to secure the conservation of minerals. They recommended that statutory provision should be made to secure the conservation of minerals.

made for the issue by a "Sanctioning Authority" of compulsory orders, where necessary in the national interest, to secure the working of minerals in certain circumstances in which the extraction of workable coal was impeded by the exercise of the rights of private property.

The Committee devoted a separate section of their Report to the question of barriers, in which they referred to the estimate of the Coal Conservation Committee of 3,500 to 4,000 million tons as the amount of coal left in barriers, and recommended that the Mines Department should have power to prepare schemes for the working of barriers, subject to proper limitations and to adequate compensation of injured parties, and that such schemes should be submitted to the proposed Sanctioning Authority for approval.

Action Taken on Recommendations.

The Mining Industry Act of 1920 gave effect to the recommendations for the establishment of a Ministry of Mines, but constituted it as a Department of the Board of Trade. The Act also gave power to the new Department to deal with waterlogged areas. Under Section 18 the Secretary for Mines has power to make drainage schemes with respect to any group of mines and to apportion as between the owners of the mines benefited any expenditure for a common purpose that may be required for any such scheme. One such drainage scheme (for the Old Hill District of Staffordshire) has already been set up under this section; and we understand that another statutory scheme is at present under consideration for South Yorkshire. Others exist on a voluntary basis.

The other recommendations were carried out to a great extent by the Mines (Working Facilities and Support) Act, 1923.

Conclusions.

1. Assuming that the present rate of output remains fairly constant, and that the working of levels deeper than 4,000 ft. does not become possible, the coal at present known to exist in the United Kingdom will last for between four and five centuries.

2. If account is also taken of probable and possible reserves, there should be enough coal to last for about seven centuries.

3. If it should prove possible to work coal from levels below 4,000 ft., or if new coalfields were discovered in areas previously untried, as was recently the case in Kent, there would be a corresponding extension in the duration of our resources.

4. There would be a further extension if fresh means were found of utilising the small coal which is now so extensively wasted. But there is also the possibility that science may discover new sources of energy, replacing in greater or less degree, the use of coal.

5. To estimate the relative weight of these factors is impossible. It is, of course, essential to exercise every economy in the utilisation of coal, so as to reduce to a minimum the waste of the energy which it contains, and to exercise economy in the methods of working coal, so as to avoid losses due to waterlogging and similar natural causes; but the general conclusion is indicated that it is unnecessary to contemplate any restriction upon the production of coal, other than that which results from the general economic conditions of the time.

It is clearly, indeed, within the bounds of possibility that, after a lapse of several centuries, the exhaustion of the British coal supplies, and the failure to find an alternative source of energy, would involve a contraction of the industrial activities of this island, and a consequent contraction of its population. But this is problematical; and even if it should occur, and a reduction in the population be necessitated, is it certain that the characteristics of our descendants will necessarily be so superior to our own, that it becomes the duty of the present generations to refrain from exploiting the natural resources of the country, in order that a restriction of their own numbers should postpone the necessity for a similar restriction in a later age?

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developed greatly since that time. The capital engaged is now in the neighbourhood of £40,000,000. The industry possesses over one hundred and fifty plants. The products, in addition to metallurgical coke, are tar, sulphate of ammonia and crude benzol, together with considerable quantities of surplus gas, which may be utilised in various ways for heating or lighting. Most of these by-products find, as a rule, a remunerative market.

An important extension in the more scientific use of coal was made at the beginning of the nineteenth century, when methods were devised, first in Great Britain, for treating it in retorts, so as to separate certain gases from the other constituents in order to supply them through pipes to householders for purposes of illumination. The British gas industry has shown a steady progress, elaborating its processes and expanding its operations. There is a capital of £160,000,000 now engaged in it, not very far short of the capital of the mining industry itself. A great variety of products are extracted from coal at gasworks in addition to the gas—namely coke, tar, ammonia, benzol and sulphur, and a large number of derivatives from these. These products furnish raw materials for chemical and dye works, and have rendered possible the great improvement in the highways that has resulted from treatment of road surfaces with tar.

In 1924 the coke-oven industry carbonised nearly 19 million tons of coal, and the gas industry over 18 million tons; coke equivalent to rather over 4 million tons of this coal was exported. Altogether some 37 million tons of coal were treated in ways which involved the splitting up of the mineral, in a greater or less degree, into other fuels—which can be used for certain purposes with greater efficiency or convenience than can raw coal—together with the recovery of some by-products other than fuels. The coal consumed in its raw state in this country in the same year amounted to over 147 million tons. About four times as much coal, therefore, is still burnt in this country in its raw state, either under boilers, in industrial furnaces, or in domestic grates and ranges, as is carbonised before being consumed. While for some purposes, such as large boiler plants, it is doubtful whether it would be economical to carbonise the coal before burning it, there is no doubt that a large proportion of the 147 million tons of the coal at present burnt in a raw state is consumed in a very wasteful manner.

Pollution of the Atmosphere.

The burning of coal in its raw state not only prevents the recovery of any of the derivatives that could be obtained by suitable pre-treatment, but leads to the pollution of the atmosphere by the discharge of products of combustion, a result detrimental in many ways to the public interest. Many of the more objectionable products result from imperfect combustion, which is inevitable if raw coal is burned in the manner customary in domestic grates and ranges.

Early in 1914 a Departmental Committee was appointed on the Abatement of Smoke and Noxious Vapours. Its inquiries were interrupted by the war, but were resumed in 1920, and reports were presented in that year and in 1921. The Committee, which conducted a close investigation into the question, reported:—

“ We are satisfied that domestic smoke, which is produced by the burning of raw coal, causes serious danger to health and damage to property.

“ Moreover, the burning of raw coal is, from the national point of view, a wasteful proceeding. Not only are the valuable by-products of tar oils, ammonia, sulphur, and cyanogen compounds lost, but, in addition, a large proportion of unconsumed fuel escapes in the form of soot, owing to inefficient appliances.

* * * * *

“ Statistical evidence shows a close relation between the death-rate and the atmospheric conditions ; the number of deaths from pulmonary and cardiac diseases is shown to increase in direct proportion to an increase in the intensity and duration of smoke fogs. The cause underlying the high mortality in towns, which is known to follow in the wake of a fog, must operate continuously, though in a lesser degree, on the health of an urban community.

“ It is hardly necessary here to enlarge upon the great importance of sunlight to the general health or upon the deleterious nature of any factor which diminishes that sunlight. The health of urban communities is most injuriously affected by the loss of sunlight due to coal smoke. It has been estimated that, broadly speaking, 20 per cent. more sunlight is experienced in the country than in a smoky town.

* * * * *

“ The waste of fuel alone is a very serious consideration. It is estimated that approximately 2½ million tons of potential fuel in the form of soot escape annually into the atmosphere from domestic fireplaces, and 500,000 tons from industrial chimneys. At £2 per ton this represents an annual and direct waste of £6,000,000. But the damage is not confined to waste of fuel. The unconsumed particles of fuel escape into and pollute the atmosphere of our cities and towns, materially increasing the expense and impairing the amenity of life in urban communities. It has been estimated that in Manchester the increased cost of household washing alone on account of smoke is over £290,000 a year.”

We would observe that the three million tons of soot which, it is estimated by the Committee, are discharged into the air annually, are equal in weight to nearly three days' output of all the collieries of Great Britain. In effect, the work of over a million men for three days every year is devoted to providing the soot which pollutes our atmosphere.

Supply of Oil from Coal.

Another important aspect of the problem concerns the provision of the liquid fuels—fuel-oil and petrol—which are being used in steadily increasing quantities. At present practically the whole of our requirements are imported. The total imports have more than doubled during the last five years, and in 1924 reached a figure of over 1,270 million gallons of crude petroleum oil or its derivatives. Liquid fuels can be obtained from coal and every million tons of coal carbonised by suitable methods will produce some 15 million gallons, or possibly more, of liquid fuels. The grades of oil produced would not necessarily correspond exactly with those now imported. But if it were possible to subject to this process the bulk of the 147 million tons of coal now consumed in the raw state, the greater part, at least, of our present requirements of oil could be supplied from home sources instead of being imported from abroad.

For these and other reasons it is clearly a matter of prime national importance that methods of treatment of coal before burning, so as to render its combustion smokeless and obviate the waste of valuable constituents, such as have already been adopted with respect to one-fifth of the coal by the gas and coke-oven industries, should be applied, if practicable, to the other four-fifths.

The question whether such a course is practicable or not has been the subject of many investigations during the last 20 years, and a number of different processes have been developed and tested in Great Britain and in other industrial countries.

One process for the production of oil is the hydrogenation of the coal; another is the production of synthetic fuels from "water-gas" obtained from coke. Hydrogenation consists in subjecting powdered coal to high temperatures and pressures in the presence of hydrogen, and results in a considerably higher conversion of the coal substance into liquid fuel than does any carbonisation process. Synthetic fuels are obtained by suitable treatment from carbon monoxide and hydrogen. These processes are both being investigated in this country, but until recently their development has been practically confined to Germany.

Low Temperature Carbonisation.

The methods which have attracted most attention in this country have been those known as low temperature carbonisation processes.

From a memorandum furnished to us by Dr. Lander, the Director of Fuel Research to the Department of Scientific and Industrial Research and one of our Assessors, we quote the following paragraph :—

“ By low temperature carbonisation is understood the destructive distillation of coal at temperatures round about 600° C., instead of at the higher temperatures of 1000° C. and upwards used in the gas and coke-oven industries. At the higher temperatures more of the coal is converted into gas and less into tar and coke, while from suitable coal a stronger coke is left behind ; incidentally, the yield of ammonia is also much greater. At the lower temperatures enough combustible volatiles are retained in the coke to enable it to catch fire and burn readily, though not enough to generate smoke. Large quantities of tar are collected without being decomposed into gas, whilst both from the gas itself and from the tar some light spirit can be extracted and converted into motor spirit. Low temperature carbonisation accordingly offers a possible means of so treating coal as to obtain at once a source of oil fuel and motor spirit, and a solid smokeless fuel that can be burned on any domestic grate.”

We have given close attention to the question of low temperature carbonisation, but we can find no evidence that the system has yet been anywhere established on a commercial scale for a period sufficiently long to enable the claims that are made on its behalf to be fully tested.

There are several experimental plants in existence which appear to work satisfactorily in producing oils and gas from non-swelling coals, some of which may, but many of which will not, produce a solid lump smokeless fuel suitable for domestic use. The production of such fuel, from those types of coal which are mostly used now for domestic purposes, is a more difficult problem. Steady advance is being made, but no plant of a type that holds out a prospect of a sufficiently low working cost has yet been run constantly for more than a few weeks without difficulties arising. These difficulties are not insuperable technically. But it is impossible to say at present whether they can be overcome without so increasing the cost of the process as to make it uneconomical, with the prices now ruling for the products. At the same time the evidence that we have taken has given us the impression that we may be within measurable distance of a solution of both the technical and the commercial problems that arise.

We recommend that the Government should give sympathetic consideration to any proposals of the Fuel Research Board for the further investigation of the process on a commercial scale.

It is clear that the financial success of the process depends upon the existence of such markets for the semi-coke, oils and gases that would be produced, as may make the best use of their

special properties and yield a remunerative return. If it be found possible to devise processes, technically sound and economically profitable, for the pre-treatment of coal, so as to produce a solid smokeless fuel which is not inferior, or is little inferior, in heating efficiency to the original raw coal, together with an oil as suitable for use in internal combustion engines or under boilers as the fuel now usually employed, with, in addition, other valuable by-products, the following advantages would accrue :—

- (1) The atmosphere of the towns and industrial districts could be made smokeless. The saving on the present cost, in labour and in money, of maintaining cleanliness would be very great. The effect upon the health of the people, upon their temperament and outlook, upon the arts of architecture and sculpture, and the amenities of the towns generally, could not fail to be large and wholly beneficial.
- (2) The nation would obtain from its own soil a considerable supply of oil for use in internal combustion engines and other purposes for which natural oils are now imported. This would offer a measure of security against the possibility that the world's supplies of natural oil may fall short of the demand, with a consequent excessive rise in price. It would render this country to a large extent independent of imported oil supplies for the Navy, Army and Air Force.
- (3) If the process enabled small and other low grade coal to be used more profitably than now, this would be a proportionate gain to both mineowners and miners.
- (4) If the total value of the constituents obtained, after deducting the cost of the process, showed a balance above the value of the raw coal, the wealth of the country would be increased to that extent.

One of the methods by which the State could most effectively promote these developments would be to offer to the producers of smokeless semi-coke an assured market, so soon as the production had been established on a commercial scale and a fuel was provided that possessed a heating value not less in relation to its price than that of the coals now bought. Such a market could be found, at all events at the outset, in the Government's own purchases. These are on a large scale. The Office of Works buys over 250,000 tons of coal a year ; the Admiralty 350,000 tons for dockyards and other shore establishments, apart from about an equal quantity of Welsh steam coal for Your Majesty's ships ; the War Office over 300,000 tons. In the total, nearly 1,000,000 tons a year are purchased by these Government Departments, not including the requirements of the Navy itself. If and when the Fuel Research Board is able to report that a smokeless semi-coke is available, fulfilling the condition that we have

mentioned as to price in relation to heating value, and in other respects as suitable as raw coal, we are of opinion that, in view of the important national interests that are involved, the Departments concerned should be instructed by the Government to purchase the semi-coke in preference ; and in order that producers may be encouraged to proceed with the enterprise, we recommend that an announcement should now be made that this will be done.

An assured market for the oil is equally important. The oil produced from low temperature tar differs in some of its properties from natural oils. The small quantities so far produced have been readily disposed of for special purposes, mostly for purposes other than fuel. Government Departments, and notably the Admiralty, could assist by giving preference to home produced oils. We are informed that the Mines Department has already been in correspondence with the Admiralty on this subject, and has received the following assurance: "The Admiralty would "certainly examine very carefully and sympathetically the "question whether the oils produced in this country are suitable "for their purposes, and would undertake to test any samples "submitted, and to offer advice with a view to the production "of oils suitable for meeting Naval requirements. In the event "of suitable grades of oil being produced in satisfactory quantities and at reasonable prices, the Admiralty would be prepared "to buy them in preference to oils of foreign origin."

Similarly, the War Office and the Air Ministry have informed the Mines Department that they "will certainly examine very "carefully and sympathetically the question whether the oils "produced in this country are suitable for their purposes and, "if they are, will buy them in preference to imported oils if they "can get at least equal value for their money."

What further steps should afterwards be taken to accelerate the use of carbonisation processes is a matter for consideration at that time. Possibly, if successful results were obtained on a large scale, the substitution of carbonised coal for raw coal would proceed with rapidity, and without need of special stimulus. If it were found, however, that, through reluctance on the part of the public to modify old methods, the smoke-producing coal, although not appreciably cheaper than the other fuel, was still used in considerable quantities, the Government and Parliament would doubtless consider whether its disuse could be accelerated. This might conceivably be done either by prohibition or by imposing a special tax upon a commodity the continued use of which would be, in the circumstances supposed, unnecessary as well as to the public detriment. This, however, is dealing with a hypothetical case, and, the antecedent conditions not yet having been realised, we abstain from making any definite recommendation.

Other Methods.

Of other means for increasing economy and efficiency in the use of fuel, some reference should be made to two methods by which solid coal can be used to some extent in a form which gives certain of the advantages of oil firing. If coal be pulverised to a sufficiently fine powder, it can be blown into furnaces, and a very complete combustion and great ease of control can be obtained. A further advantage is that fine coal, and coal containing a high percentage of ash, can be utilised. The use of pulverised coal is extending in America and on the Continent, and would appear to have advantages for use in this country in suitable cases. If the finely divided coal be intimately mixed with fuel oil, there results the so-called colloidal fuel, which can be used in the same way as ordinary fuel oil for boiler-firing in ships and elsewhere. It has the advantage that a substantial proportion (25-30 per cent.) of the fuel, namely, the coal, is produced in this country. It has the disadvantage that sooner or later the coal is liable to separate out from the oil, and to clog the pipes. There is room for further investigation as to the possibilities of pulverised coal and colloidal fuel for use in this country.

Co-ordination of Coal-using Industries.

We turn to the wider question, which of the many possible methods, or combinations of methods, of using the coal should be adopted in any given case. The answer must necessarily depend upon a variety of factors. The principal factors are:—

- (a) The composition of the coals that are available, and their comparative prices.
- (b) The possibility of using small or waste coal.
- (c) The markets that are available for the energy or the by-products, and the prices to be obtained.
- (d) The capital costs of the alternative plants.
- (e) The labour costs of the processes.
- (f) For the generation of electricity, the existence of adequate water-supplies for cooling.

A decision can be reached in a particular case only by a careful estimating and balancing of these factors.

The locality to be selected for an enterprise—whether it should be situated in the neighbourhood of collieries, or of blast furnaces, or of other industries, or of a consuming population—depends upon similar considerations. It depends also upon the comparative costs of transporting raw coal, or coke, or electricity, or heat, or gas, as the case may be. These are highly technical questions on which only the engineer or chemist is qualified to

speak. The answers must necessarily vary also with the circumstances, so that not even the expert can generalise. Certain conclusions, germane to our present inquiry, can, however, be drawn from a survey of the existing situation.

- (1) Present methods utilise as a rule only a fraction of the potential energy of the coal.
- (2) The burning of raw coal is frequently wasteful.
- (3) It may, however, be more economical in some cases to burn low grade coal to produce power at or near the pit, than to pay for the transport of such coal, or of a higher grade coal, to be used more scientifically elsewhere.

Many industries require large quantities of low grade heat, that is heat at low temperatures ; others require heat at high temperatures under conditions where much of the energy is necessarily surplus. In such circumstances it is often possible to generate power at a very low cost, provided that the power is generated close to the spot at which the heat is required. The provision of a network of electric power mains covering the country, into which power could be fed at any point, or from which power could be taken as required, would enable full advantage to be taken of cheap power available in any place in excess of local requirements, and thus form a means of utilising to the full any waste heat that may be available.

The question, then, is not one of a simple choice between one or two alternative methods, such as burning raw coal to produce steam power on the one hand, or to produce electricity on the other ; but of the balancing of a variety of factors, and often of a combination of possible processes.

It has been strongly impressed upon us as the outcome of our inquiries that it is an error to suppose that the only, or even the principal, object to be aimed at in this connection is the most economical method of producing electricity. The object to be aimed at is the most economical and efficient way of utilising the energy embodied in the coal. The question is not the co-ordination, as is often supposed, of two industries—coal and electricity ; but of several—coal, electricity, gas, oil, chemical products, blast furnaces, coke ovens, etc. Two or more methods, dealing with two, three or more of these, may be used simultaneously in combination, one feeding the other.

The point of importance is that no obstacles, whether of State regulation or industrial organisation, should be placed in the way of the development of such combinations, in whatever manner engineering and chemical skill, and the economic conditions, may indicate as the most suitable. Sometimes a single commercial undertaking, divided into a number of departments, may conduct several of such industries, either in the same place or in different places. Sometimes there may be separate companies, associated by permanent commercial agreements. Sometimes there may be

separate companies, dealing with one another only by way of ordinary contracts. It should be clearly recognised and constantly emphasised that the interests of the industries of mining, gasworks, electricity stations, coke and by-product undertakings, and blast-furnaces are closely interlocked, and it is to the obvious interest of those who are engaged in them, whether employers or employed, that they should encourage whatever combinations are desirable in each particular case to promote their mutual prosperity.

A National Supervisory Body.

In a memorandum prepared by Dr. Lander, it is stated that "no comprehensive survey has ever been made of the heat, light and power requirements of various industries or of the country as a whole, and how they can be most economically met by the various processes at present commercially feasible; still less has the broad question been considered from the point of view of possible development in the future." We consider that such a survey is imperatively required in the national interest. But we hold the view that it is not a matter on which a single investigation, undertaken at a particular time, would be likely to furnish the most fruitful results. The problems to be dealt with are so diverse, and the sciences and practices that are concerned are in a state of such active development, that the survey which is needed should rather be a continuous process, undertaken by a body of a permanent character.

So far as electricity is concerned, a valuable method of securing the effective treatment of its special problems and interests has been adopted through the appointment of an Electricity Commission. We shall find it necessary, in a later chapter, to recommend the appointment of a body of Coal Commissioners, for the performance of duties which will be described in the appropriate part of this Report. The Gas Industry has organised its own Gas Council, which represents both the Municipal Authorities and the commercial companies that are engaged in it. These various bodies would cover much the greater part of the activities which it is desirable to co-ordinate. We have not had the opportunity of taking evidence on this point from the Electricity Commissioners or the Gas Council, or the other bodies concerned. We therefore abstain from making any definite recommendation. But we venture to suggest for consideration the formation of a Standing Conference, composed, perhaps, of the Chairman and other representatives of the three bodies we have mentioned. In the case of coal, the Secretary for Mines might find it preferable, however, to choose some representative who was not the Chairman or a member of the Coal Commission. There might be included also representatives of the oil interest, and of the coking and by-products and the chemical industries. This body, under some such title as the National Fuel and Power Committee, would

exercise functions that would be advisory and not executive. Its primary task would be to ensure that, while a healthy competition should be maintained, where it was legitimate, between these various interests, their energies should be developed in a manner complementary, in the main, to each other ; and that the actions of the State and of local authorities should be guided by a survey which would be comprehensive and not one-sided. Such a committee would doubtless keep in close touch with the Department of Scientific and Industrial Research.

It might perhaps be found desirable to add to its membership representatives of the Association of Municipal Corporations and of the County Councils Association, since important questions relating to Local Government areas and the powers of their authorities arise in this connection. These areas, the outcome of their historical origins, suitable as they no doubt are for most of the purposes with which they are concerned, do not necessarily correspond with the areas which should be adopted when schemes relating to fuel and power are in question. The adjustments necessary in particular cases could be advantageously considered under the auspices of a central body such as that which we suggest.

CHAPTER IV.—RESEARCH.

Research connected with coal may be divided broadly into :—

- A.—Occurrence and Constitution.
- B.—Coal Winning.
- C.—Coal Utilisation.

These main divisions may be sub-divided as follows :—

A.—OCCURRENCE AND CONSTITUTION.

- (1) The geology of the occurrence of coal.
- (2) The constitution of coal in general, and the characteristics of the individual seams in particular.

B.—COAL WINNING.

- (1) The characteristics of the coal measures from the point of view of coal winning.
- (2) Methods of working, plant, apparatus, appliances and material.
- (3) Ventilation.
- (4) The human side.
- (5) Safety.
- (6) Health.
- (7) Preparation of the coal for the market—including cleaning, grading, etc.

C.—COAL UTILISATION.

- (1) Utilisation of coal in its natural state.
- (2) Treatment of coal for the production of other forms of fuel with the possible recovery of products other than fuel :—
 - (a) By destructive distillation at high temperatures.
 - (b) By destructive distillation at low temperatures.
 - (c) By pulverising for the production of "colloidal" fuel.
 - (d) By liquefaction.
 - (e) By synthetic methods.

Certain matters in connection with the materials, such as fire-clay etc., often closely associated with the coal measures, should also receive attention.

Research work on these problems, many of which are inter-dependent, is at present being carried out by a number of organisations, boards and committees. Most of these bodies are in touch with one another owing to the fact that certain of the members serve on more than one of them.

The following is a brief statement of the manner in which the various problems enumerated above are being dealt with.

OCCURRENCE AND CONSTITUTION.

(1) *The Geology of the Occurrence of Coal.*—Study of the geology of coal is undertaken by the Geological Survey of Great Britain, which is a branch of the Department of Scientific and Industrial Research. For the purposes of survey, the country has been divided into nine districts and the work in each is carried out by a field unit composed of geologists.

The field units are engaged upon the prosecution of a primary six-inch survey of the coalfields of Great Britain and on the revision of the coalfields originally surveyed on the six-inch scale but not revised during the last thirty years.

Arrangements have been made for the full co-operation of the Geological Survey with the Physical and Chemical Survey of the National Coal Resources which has been started by the Fuel Research Division of the Department of Scientific and Industrial Research.

The results of the Geological Survey are published in the form of maps, memoirs and reports, and its expenditure is met from public funds.

Much useful work has also been done by the more enterprising mineral owners, coalowners and pioneering companies in searching for and proving coal. The Geological Survey bases some of its information on the results of these borings.

(2) *The Constitution of Coal in general, and the Characteristics of the Individual Seams in particular.*—Study of the constitution of coal is being carried out to some extent by private individuals, and by the Safety in Mines Research Board in connection with Safety Research. A detailed study of the coal seams is being made by the Physical and Chemical Survey of the National Coal Resources.

As stated above, the survey is carried out in co-operation with the Geological Survey, and the local arrangements in the coalfields are made by committees on which colliery owners and managers are represented. The objects of this survey are briefly as follows :—

- (1) To obtain exact knowledge as to the properties of the coal seams.
- (2) To bring the available geological information into relation with the physical and chemical data, and to indicate the variations in properties which occur in the seams of each coalfield when passing from one locality to another.
- (3) To suggest the most suitable methods of utilisation of the seams in view of the properties disclosed in (1) and (2).
- (4) To devise new methods for the examination of coal.
- (5) To record and, if desirable, to publish information as it becomes available.

Reports on the work are published from time to time.

Connected with this work is the study of methods of sampling and analysis necessary for the work of the survey as well as for purposes of buying and selling to a specification. This is carried out under the supervision of the Sampling and Analysis of Coal Committee, which is a standing committee of the Fuel Research Board. A report has been issued on the methods of analysis of coal. It is intended to continue to verify any new suggestions by experiment and thus to present to analysts and coal users generally an authoritative statement of the best current practice in the methods of valuing coal.

The question of sampling of coal is still under consideration. Briefly, the Committee are dealing with the three following types of sampling :—

- (1) Sampling the seam *in situ*.
- (2) Sampling a consignment for special tests, such as boiler trials, etc.
- (3) Commercial sampling.

More general investigations into the constitution of coal are carried out at the Fuel Research Station and in university and private laboratories, as well as by the Safety in Mines Research Board. Among the universities carrying out research into fuel are :—

Birmingham (Special Mining Research Laboratory supported by a Coal Owners' Committee); School of Mines, Treforest, (supported by the Welsh Coalowners); Edinburgh; Glasgow; London; Manchester; Newcastle (University of Durham); Sheffield; Leeds and Nottingham.

COAL WINNING.

Research in connection with coal winning is primarily the concern of the coal industry, and it has hitherto been carried on mainly by individuals (*vide* the Transactions of the Institute of Mining Engineers and its associated bodies). There are Coal-owners' Research Associations in certain areas, *e.g.*, The Lancashire and Cheshire Coal Research Association and the Doncaster Coal Owners' Research Association; but until the Colliery Owners' Research Association was founded in 1925 there was no authority, generally representative of the Industry, concerned solely with "coal-winning" research. The funds at the disposal of this Association are strictly limited, however, and it is not at present in a position to carry out adequately the work required, namely the co-ordination of and assistance to work now being done, and the encouragement, initiation and direction of new researches.

(1) *The characteristics of the coal measures from the point of view of coal winning.*—No organised work on this subject is undertaken at present.

(2) *Methods of working, plant, apparatus, appliances and material.*—Investigations in these directions are within the scope of the British Colliery Owners' Research Association. Various technical bodies and local organisations, and the different industries providing the plant, are also concerned. The Safety in Mines Research Board also deals with plant from the safety point of view. (See under paragraph (5).)

The Mining Association, with the British Engineering Standards Association, has recently set out to standardise colliery plant and equipment, and the work is proceeding through Committees of those concerned with the manufacture and use of such plant. It is perhaps the most important general inquiry in which the industry has in recent times been engaged, and in view of the multifarious types of plant and equipment now used at different collieries for similar purposes, it may be expected to yield valuable gains in efficiency and economy.

(3) *Ventilation.*—Ventilation is within the scope of the British Colliery Owners' Research Association, and research on this subject is being done by Sheffield University.

(4) *The human side.*—The study of the human side has been carried out to some extent by the Industrial Fatigue Research Board, and also by the National Institute of Industrial Psychology.

The Industrial Fatigue Research Board is carrying out, at its own expense, an extended inquiry into the atmospheric conditions under ground in relation to health and efficiency. (See also paragraph 6 (v) below.)

The National Institute of Industrial Psychology carried out investigations lasting over 27 months in four collieries, having for their object the diminution of the obstacles and difficulties which prevent the miner from giving his best. Such matters as the methods of carrying out the work, *i.e.*, motion study, illumination, nature of tools etc., were investigated.

Funds were found for the above investigations by the Mining Association and private mineowners.

(5) *Safety.*—Matters in connection with safety in mines are covered in the main by the Safety in Mines Research Board, appointed by the Secretary for Mines to direct generally the work of research of the Mines Department into the causes of mining dangers and the means of preventing them.

Research work is being carried out under the Board's supervision, directly or through Committees, by a scientific and technical staff, about 50 in number, chiefly at two experimental stations, one at Sheffield for laboratory work, in close touch with the University, and one at Buxton (formerly at Eskmeals), mainly for large-scale work on explosions and explosives. Work is also in progress, though to a smaller extent, with the aid of grants from the Board, at various Universities and other centres.

Research on many of the subjects under investigation is also in progress abroad—especially in the United States of America,

France, Belgium, Germany, South Africa, Canada, Australia and India. The home mining industry is assured of the advantage of the results obtained in these countries by means of arrangements for the exchange of publications made by the Mines Department and the Safety in Mines Research Board. In the case of the United States, where an exceptionally active Government research organisation exists, the Board has entered into a definite scheme of co-operation with the objects of (1) avoiding unnecessary duplication of experimental work; (2) arranging for the mutual exchange of ideas and discussion of results between individual members of the staffs; (3) testing the validity of important conclusions under a greater variety of conditions; (4) facilitating the application of safety devices.

The following is a list of groups of researches controlled by the Board:—

- Coal dust explosions.
- Firedamp explosions.
- Support of underground workings.
- Spontaneous combustion of coal.
- Electricity in mines.
- Mining explosives and shot-firing appliances.
- Safety lamps (flame and electric).
- Wire ropes.
- Shaft safety appliances.
- Examination of safety inventions.

It is obvious from consideration of the detailed programmes which are given in the Board's Annual Report that a great deal of this work, while directed to safety, is of great value to research into the constitution of coal and coal winning.

Financial provision for these investigations and researches is made, on the recommendation of the Safety in Mines Research Board, by the Miners' Welfare Committee out of the Miners' Welfare Fund, and a small sum is also available annually out of the Mines Department's vote. The total sum spent in each of the last three years is about £50,000.

Research work on safety is also carried out by some universities and other bodies; while there is also some research work on safety questions arising out of statutory testing duties which is carried out by the Mines Department Testing Staff, maintained by public funds.

(6) *Health*.—Health in mines is dealt with in the main by the Health Advisory Committee of the Secretary for Mines, which advises what research is necessary, and what are the most convenient and effective arrangements for carrying it out; unless the work is supervised, as it is in many cases, by the Medical Research Council or other similar authority, the Committee itself supervises.

Close touch is kept, through members of the Committee, with the Safety in Mines Research Board, the Miners' Welfare Committee and the Medical Research Council.

The principal work in progress is :—

- (i) The causation and prevention of nystagmus, and of "beat-hand," "beat-knee" and "beat-elbow." (Medical Research Council.)
- (ii) A statistical investigation of the incidence of diseases in general among the mining population, as compared with other industrial populations and the population generally. (Health Advisory Committee and Medical Research Council.)
- (iii) The general question of the effect on the lungs of the various dusts occurring in mines, with particular reference to miners' phthisis (the universities), and a special study at coal mines of work which might possibly give rise to miners' phthisis from stone dust. (Mines Department.)
- (iv) Work on miners' cramp. (Birmingham University.)
- (v) The atmospheric conditions under-ground in relation to health and efficiency. (The Deep and Hot Mines Research Committee, which receives an annual grant of £1,500 from the Miners' Welfare Fund.)
- (vi) Problems on the nutrition of miners. (Medical Research Council.)

Individual research has made, and continues to make, many important contributions to knowledge in the sphere of the health of the miner.

The Medical Research Council has been generous in finding funds for the work which it undertakes to carry out. Funds required, and not available from this or other sources, have been provided by the Miners' Welfare Committee.

(7) *Preparation of the Coal for the Market—including Cleaning, Grading, etc.*—Preparation of coal for the market and methods of purification are being studied by the British Colliery Owners' Research Association, and by the makers of appliances used for the purpose. The question is also being investigated by the Fuel Research Division of the Department of Scientific and Industrial Research in conjunction with the Physical and Chemical Survey, and centrally at the Fuel Research Station. This question is also of interest to big users.

COAL UTILISATION.

In view of the great importance of coal to this country it is surprising that so little scientific attention has been paid to its nature and possible uses, that the Fuel Research Board, in their Report for the period ended 31st December, 1924, felt compelled to declare that "Our knowledge of the composition of coal and

of the factors that influence its behaviour when heated is still extremely limited." This ignorance is now gradually, but slowly, being relieved by the investigations of the Research Board, established only in 1917, and of several other agencies.

Research on coal utilisation is carried out by the gas and coke oven and certain allied industries, so far as the treatment of coal for the production of gas and coke and of the by-products of these industries is concerned.

General problems connected with the better utilisation of our fuel resources are dealt with by the Fuel Research Division of the Department of Scientific and Industrial Research. The work falls under two main heads. The first concerns the examination and classification of the coal seams of the various coal mining districts already referred to. The second main head concerns the treatment of coal with a view to the production of a smokeless fuel and, at the same time, of home supplies of fuel oil for the Navy and liquid fuel for use in internal combustion engines. The Fuel Research Division is also engaged on work in connection with (a) the gas industry; (b) steam raising; (c) domestic heating; (d) power alcohol and tests of liquid fuels for internal combustion engines; and, on a smaller scale, on investigations connected with metallurgical coke, furnace design, the constitution of coal, coal purification, etc.

The net expenditure for the last five years on fuel research, including the cost of the Physical and Chemical Survey of the National Coal Resources, met from the Vote of the Department of Scientific and Industrial Research has been, in round figures, as follows:—

<i>Year ended</i>					<i>Net Expenditure.</i>
					£
31st March, 1922	..	..	..	..	47,000
31st March, 1923	..	..	..	..	48,000
31st March, 1924	..	..	..	..	43,000
31st March, 1925	..	..	..	..	48,000
31st March, 1926 (estimated)	..	..	..	..	78,000

Other methods of coal utilisation are dealt with under their specific headings.

(1) *Utilisation of Coal in its Natural State.*—This is dealt with by the Fuel Research Division, by the Fuel Economy Committee of the Federation of British Industries and by various engineering institutions.

(2) *Treatment of Coal for the Production of other forms of Fuel, with the possible Recovery of Products other than Fuel:*—

(a) *By Destructive Distillation at High Temperatures.*—Treatment of coal by carbonisation etc., is studied for the gas industry by the Gas Investigation Committee of the Institution of Gas Engineers in conjunction with the University of Leeds, and by several of the large gas undertakings. The work for the coke

oven industry is done by the National Federation of Iron and Steel Manufacturers, who have a Fuel Economy Committee dealing with the production of coke as well as with economy in its use.

The National Benzol Association has formed a Committee, in conjunction with the University of Leeds, for the purpose of investigating technical and scientific matters of interest to the benzol industry.

(b) *By Destructive Distillation at Low Temperatures.*—Low temperature carbonisation is one of the main researches of the Fuel Research Division, and is also being experimented on by various firms and individuals.

The Fuel Research Division of the Department of Scientific and Industrial Research is conducting work on all the above forms of carbonisation, and on the production of oil from coal by methods other than carbonisation, and is in close touch with outside work both at home and abroad.

The further working up of products of carbonisation, other than fuels, is carried out by the large chemical manufacturing companies.

(c) *By Pulverising for the Production of Colloidal Fuel.*—Work in connection with the use of pulverised fuel is in the hands of private enterprise.

(d) *Liquefaction.*—Preliminary work on the liquefaction of coal and of coal tars, by the process known as the Bergius process, is being conducted by the Department of Scientific and Industrial Research, and at Birmingham University. A considerable amount of experiment on the process, on the semi-technical scale, is being carried out on the continent, notably in Germany. The Department is in close touch with this work.

(e) *Synthetic Methods.*—The conversion of water gas produced from coke, mixed with additional hydrogen, into liquid fuels suitable for use in internal combustion engines, is being studied on a small scale by the Department of Scientific and Industrial Research. The process is already being worked on a large industrial scale in Germany for the manufacture of methyl alcohol and is being actively studied in other countries as well as in Germany.

THE FUTURE OF RESEARCH WORK.

Mr. Evan Williams, President of the Mining Association of Great Britain, giving evidence before us, said that the Mining Association were sympathetic to the needs of research, and were taking active steps to support it; that the Mining Association contemplated steadily increasing the funds available for research, but, as at present advised, they did not propose initiating or carrying out research themselves; their idea was to give financial support to bodies which were conducting research, if they were

satisfied that their objects were for the good of the industry.* Mr. Evan Williams further said that the British Colliery Owners' Research Association had not so far taken the initiative in indicating the type of research that should be done.

We think that this attitude indicates an insufficient appreciation of the importance of the question. While research alone will not overcome the difficulties from which the industry is now suffering, we feel strongly that steady and continuous investigation into all pertinent problems is essential if the industry is to prosper and to provide good wages and conditions for its workers. Investigations into any problem may be lengthy, and immediate results must not be expected, but, in our view, these problems will never be solved by a system of small grants to bodies or individuals who are anxious to work on some item.

It is clear that our future as an industrial nation depends largely upon a regular supply of coal at a moderate price. We consider that the careful, systematic and continued application of science to the practices of the coal mining industry is one of the most important essentials necessary to achieve this end. As no single colliery or group of collieries could, unaided, undertake the investigations necessary, it is essential that a really strong Research Association should be developed, embracing all sections of the industry, to take the initiative in investigating the problems more directly affecting the coal industry, many of which are not, in our opinion, adequately dealt with at present. It is also essential that the industry as a whole should become imbued with the spirit of science, in order that it may utilise to the fullest extent the results of modern scientific developments.

Problems connected with the winning of coal alone concern the coal mining industry and the makers of the plant and apparatus used. Problems connected with the utilisation of coal concern not only the coal industry but every industry, perhaps every individual in the country, and for this reason a study of the broad features of utilisation, and research into improved methods, cannot be left entirely to a Research Association controlled by the coal producers. For the investigation of both problems, the study of the constitution of coal, and in particular of its variation from seam to seam and throughout individual seams, is necessary. There is also the geological aspect which cannot be considered apart from the general geology of the country.

Owing to the wide range of the problems involved, and the diversity of the interests concerned, we consider that the research work necessary cannot all be carried out or supervised in detail by one organisation, but owing to the common factors underlying many of the problems, the closest touch must be kept between the different organisations concerned.

* Evan Williams, Q. 16863.

We recommend that the British Colliery Owners' Research Association, which has been formed through the Mining Association, be rapidly expanded, and placed on such a footing that it can deal adequately with the problems in connection with the winning of coal, and co-operate with the other existing organisations in problems of common interest. The programme of its work should include :—

- (i) The study of plant, apparatus, and materials used in mining (in conjunction with the manufacturers and other Research Associations).
- (ii) Methods of winning coal, ventilation of mines, transport, and cognate problems.
- (iii) Study of the human side, effects of illumination, methods of selection and training of miners, etc. (in consultation with the Industrial Fatigue Research Board).
- (iv) Preparation of coal for the market, including grading and cleaning, and methods of sampling (in conjunction with the Fuel Research Division of the Department of Scientific and Industrial Research).
- (v) The economical generation and distribution of power required for mining purposes; and the utilisation of waste heat.
- (vi) Study of the physical and chemical characteristics of the coal seams (in conjunction with the Fuel Research Division of the Department of Scientific and Industrial Research).

The Managing Council of the Association should be composed of representatives of the owners, managers, mining engineers, workers in the industry, the Mines Department and the Department of Scientific and Industrial Research.

A Director of Research having high qualifications in physical, and, if possible, in engineering, science, should be appointed at an early date, and a research headquarters established. Heads of Departments and adequate staffs to carry out the work should be appointed as the organisation develops.

The work we envisage for this Research Association must, in order to be effective, embrace scientific investigations on a really large scale; such work requires time to produce results of commercial value, and, if the right type of scientific man is to be attracted, some continuity must be assured. For these reasons we consider that an income averaging £40–50,000 per annum should be guaranteed for at least seven years, in addition to a capital sum of £100,000 for the establishment of a headquarters. We mention £40–50,000 as an *average*, as it will not be possible to spend economically up to this amount in the first few years when the organisation is developing, but after the development period an expenditure greater than £50,000 per annum will almost

certainly be required, and we are confirmed in this opinion by the fact that the cotton industry, the value of whose product is similar to that of coal mining, is now spending at this rate for the purposes of research.

We recommend that the funds necessary to carry out the above scheme be provided partly by the owners, and partly by the Department of Scientific and Industrial Research. We recommend that the Department of Scientific and Industrial Research take the initiative in organising and developing this Research Association on similar lines to those already formed.

We consider that the work now being carried out by the Fuel Research Division of the Department of Scientific and Industrial Research is of the utmost importance, and that ample funds should be made available for this purpose. In particular we consider that the work on low temperature carbonisation should be pressed forward, and that the metallurgical problems connected with the material for the retorts should receive adequate attention from the appropriate organisations; this implies that adequate funds should be available.

We recommend that the Physical and Chemical Survey of the National Coal Resources, under the Fuel Research Division of the Department of Scientific and Industrial Research, be pushed forward as rapidly as possible, and that local committees be established without delay in all mining areas.

We recommend that the Colliery Owners' Research Association encourage the scientific training of students for the work of the Research Association and for the survey, and that, for these purposes, it be authorised to provide scholarships and arrange with universities for suitable courses.

We recommend that the valuable work now being done on safety and health be continued and developed.

If the research work which we consider necessary is organised and developed as here recommended, there will be three large organisations each dealing mainly with one aspect of the coal problems :—

- (a) The Colliery Owners' Research Association, dealing with coal winning.
- (b) The Safety in Mines Research Board, dealing with safety.
- (c) The Fuel Research Division of the Department of Scientific and Industrial Research, dealing with utilisation.

As already shown these problems are not independent; it is essential for efficient working that there shall be full interchange of information and that problems of interest to more than one organisation shall not be taken up independently.

Since a portion of the funds will be derived from Government sources, we recommend that responsibility for co-ordinating the work and preserving a proper balance between its various parts be placed on the Department of Scientific and Industrial Research.

We are strongly of opinion that research work can only be carried on efficiently if the organisation concerned is in a position to develop its programme logically and steadily, and that nothing is so conducive to inefficiency and to wasteful expenditure as instructions to develop the work alternating with instructions to contract it. Steps should therefore be taken to ensure that the organisations concerned are in a sound financial position, so that they can develop their programmes in a methodical manner over a period of years.

PART II.—ORGANISATION OF THE INDUSTRY.**CHAPTER V.—STRUCTURE OF THE INDUSTRY.***Its Diversity.*

The principal characteristic of the industry, in comparison with other productive and distributive industries, is its diversity. The only generalisation about it that is safe is that no generalisation is possible. In this diversity, agriculture alone is comparable to it. There are geological differences—the depth of the coal seams from the surface ; the thickness of the seams ; the chemical composition of the coal, making it specially suitable, as the case may be, for household purposes, for coking, for the production of gas, for the heating of steam boilers, for the possible production of oil, or of other by-products ; the degree of its mixture with dirt or with other impurities ; the soundness or unsoundness of the roof and floor in the workings of the mine ; the quantity of water to be dealt with in sinking the shafts and in working the seams ; the degree of danger from gas ; the presence of faults in the seams and their inclination ; the gradients at which the roadways have to be made through the coal. There are geographical differences—in respect to the proximity of the coal deposit to a market or to a port ; the suitability of the surface for the proper lay-out of a colliery ; the presence of ample supplies of water for the condensation plant and other purposes ; the availability of housing for the persons employed. There are differences due to variations in the working customs of the districts, the outcome of a long development among a population mainly stationary ; customs relating to the rates of wages ; the grant of free houses, or of allowances in lieu, and of free or cheaper coal ; the working of two or more coal-getting shifts in the day, or of only one ; the arrangements as to holidays ; sometimes, within the limits allowed by State regulation, there are still different practices as to the hours of labour. There are differences due to the history or character of a particular mine ; its original lay-out, the boundaries of the area leased from the surface owners, the extent of the unworked reserves.

All these diversities are special to the mining industry. In addition there are the differences that are to be found in all industries—in the degree of competence in the management of each business, the soundness or unsoundness of its financing, the availability of the capital needed, the size of the undertaking in relation to the most economic methods of production. From the special diversities arises the science of Mining Engineering, an elaborate science, the mastery of which requires from the student years of application. To deal with them the profession of Mine Managers has come into being, a profession that also demands a

high standard of knowledge and capacity. There has grown up also a well organised technical press, making quickly accessible the knowledge of new developments.

The industry cannot therefore be regarded as a collection of more or less uniform undertakings, employing so many men under conditions fairly similar, producing a single article, the costs of production and the price obtained varying little among them at any time. There are now in Great Britain about 1,400 colliery undertakings owning about 2,500 mines*; many employ less than 50 men, several more than 3,000; some produce coal at a cost of 12s. per ton, others, at the same time, at a cost of 30s.; some sell qualities of coal at the pithead at 34s. per ton if anthracite, or 25s. if other kinds of coal; others sell their inferior qualities at 13s.; some make a profit, even under the unfavourable conditions of the year 1925, of 5s. per ton, some a loss of equal amount, even under the favourable conditions of 1923.

The industry may indeed be imagined as not unlike a series of farms in a country of valleys and mountains, varying in their productivity from the fat lands by the rivers, through medium lands on the lower slopes, up, through farms of gradually decreasing fertility, to fields that are half rock at the limit of cultivation on the higher slopes. The question for the agriculturists is how far up the mountain-side it is worth while to spend labour. And that depends upon the cost of labour at the time, and the degree of hardship that the cultivator is willing to endure. In the mining industry the productivity of each individual mine is due, not only to its physical characteristics, but to a combination of the many factors that have been mentioned.

The conclusion is that for only a few purposes is it possible to treat the industry as a whole. The controversies that have taken place with respect to it; supported as they have been by average figures relating to all the mines, have frequently been beside the mark. Averages may be useful, and indeed indispensable, when it is clear that like is being compared with like, or one period with another period. But they have to be used with much care, and it is often as futile to found a conclusion upon figures that average the cost of production, or the prices obtained, for the whole mining industry, as it would be to average the cost of working, and the value of the produce, of the rich lands by the river, with those of the last farm on the upper margin of cultivation, and to take the resulting figures as indicating the economic condition of the countryside as a whole.

Obsolescence of the Mines.

The second principal characteristic that differentiates this industry from others is that each of its units is productive only for a definite period. The period is usually long; but whether it be long or short, there comes an end to it, when the unit must be discarded. A factory, a farm, a railway, a dock, may exist

* See notes in Section 1 of the Annex.

indefinitely. Particular parts may be changed ; buildings may be altered ; equipment renewed ; but the enterprise itself may continue in the same place as long as there is a need for its product or service. A mine is different. It is sunk, it is developed, it is worked out, and it is closed. This obsolescence and closing of mines is a normal feature of the industry, and indeed essential to its nature. The question therefore arises, with respect to every mine without exception, at what date it ought to be closed. Whether the decision, at any given time, is to be in the affirmative or the negative will obviously depend upon the cost of working that particular mine in relation to the sum received from the sale of its produce. If it has been possible to take measures to enable coal to be won at a long distance from the shaft, or from inferior seams, at not much greater expense than the coal had been won nearer the shaft or from the better seams, then the life of the mine may be prolonged. If prices rise or costs fall, the closing may be postponed (unless, indeed, the output is increased) ; if prices fall or costs rise, the closing will be expedited. The mine may continue, if conditions are not unfavourable, until all the coal that may be regarded as workable within the area of its lease has been extracted. But whether it be sooner or whether it be later, the time comes when its productivity ceases ; then the equipment is removed and the shafts and workings are abandoned.

Every year a considerable number of new pits are opened, and over a series of years about an equal number are closed ; most of them are small in size. Between 1913 and 1924, however, there was some reduction in the total, from 3,121 to 2,718.

We print in Table 5, Appendix No. 18, a classification according to their age and their size of the mines that are now working. It shows that the average age of the larger mines, employing 500 workpeople or more, is 51 years. One-third of our mines are under 30 years old. There are still in this country 57 mines, each employing an average of 855 workpeople, which are known to be more than a hundred years old.

The South Yorkshire and Nottinghamshire Coalfield.

The most important feature of the last thirty years in this connection, and one that has a profound influence on the existing economic situation of the industry, is the development of the great new coalfield of South Yorkshire and Nottinghamshire, where rich seams of good quality coal, but situated at considerable depths, are being actively worked.

It is probably true to say that, within that period, an area of not less than 600 square miles, of which only inferential geological knowledge was previously available, has been definitely proved and has been added to the hitherto recognised coalfield. In this new area the development of the coal resources is being prosecuted with great vigour. During the present century no fewer than 19 pits have been sunk and have reached a productive stage,

and sinking is proceeding at three more. Explorations are being undertaken upon selected sites, and it is highly probable that other sinkings will be undertaken in the very near future.

In view of the depth at which the coal seams lie, the sinking and equipment of these pits involves an immense outlay, and in each case the undertaking has been planned on a very large scale, to deal with a large output. Three of the collieries have already substantially exceeded an output of one million tons per annum each, five are approaching that figure and others are developing rapidly. It is doubtful if, in any case, the maximum of production has yet been reached.

During 1924 the combined output of these twentieth century collieries exceeded 11 million tons. By 1930, failing any unforeseen hindrance, it may be estimated that the output of these new pits will be about 20 million tons. This will be equal to the whole production in 1924 of Lancashire and Cheshire, or more than half the production of Scotland. It is estimated that there is contained in the areas served by these collieries, in seams of 3 ft. thickness and upwards, and at depths of not more than 3,500 ft., no less than 7,666 million tons of coal. If the available coal in this field were worked at an annual rate of 20 million tons, it would last nearly four hundred years before exhaustion.

Number and Location of the Mines.

It is important to bear in mind that the number of mines is much larger than the number of "undertakings." Of mines, producing coal as the principal product, there were in 1924, 2,481. These as already stated belonged to about 1,400 separate undertakings. But in 1923, which may be taken as a representative year for this purpose, over 98 per cent. of the output was produced by 715 undertakings each employing over 100 persons; over 93 per cent. by 467 undertakings each employing over 500 persons, and over 84 per cent. by 323 undertakings each employing over 1,000 persons.

Some of the mines are on a very small scale. We were informed, when we visited the Rhondda Valley, of one which gave employment to two men. It was entered by a slope running down into a hillside, and it exploited a pocket of coal left by some old undertaking. The men would often work in the mine during the winter and on the farms in the summer. We visited a mine in Lanarkshire that employed 24 men. The capital of the enterprise was £350. It also was engaged in extracting some good coal, accessible by an adit, that had been left unworked many years ago. The coal was sold in the neighbourhood—a small motor lorry conveying it. Although a royalty of 1s. 3d. per ton was paid to the landowner and the usual standard of miners' wages to the men, the undertaking was said to be not unprofitable. Unless some over-riding public interest should be involved in particular cases, there is no reason why there should be any interference with these gleaners of the

coalfields. Others of these very small mines may be maintained by landowners in order to supply coal for the needs of their estates, or may be used for getting coal for lime-kilns in the neighbourhood.

For the purpose of our inquiry, it is not necessary to take into account the very small undertakings. The conditions of this great national industry cannot be considered in relation to the success or failure that may attend them. If they are able to survive under the conditions that prevail, well and good. They will furnish employment in the aggregate to a not inconsiderable body of men. But it is obvious that the conditions of the industry can in no degree be adapted to suit their interests. We have to consider those units that are typical and important, and we have concentrated our attention, therefore, upon the larger undertakings, by which almost the whole of the output is produced.

The present number and location of the mines is the result of the process by which the industry has gradually evolved from small beginnings to the dimensions of to-day. The coal being the property of the owners of the surface, and being worked, as a rule, by persons other than the owners, the mines have been sunk wherever mutually satisfactory arrangements could be made between the one party and the other. If a landowner, or a group of neighbouring landowners, had for disposal a sufficient quantity of workable coal of suitable quality, and if a mine-owner or group of mine-owners had sufficient capital available for the purpose, a pit, or several pits, would be sunk and the coal worked. There has been no directing authority to control the planning of the coalfields. The growth has been often haphazard, the number and situation of the collieries being largely dependent upon the boundaries of the properties of the surfaceowners.

Modern Mining Conditions.

Each undertaking was necessarily designed in accordance with the engineering practice of the time when it was initiated, account being taken, no doubt, of probable future changes, so far as they could be foreseen. There has, in fact, been a constant development of mining practice, and this has been specially apparent during the present century. The use of electric power has effected great modifications in mining engineering. Deeper seams are being worked. Mechanical coal cutters and conveyors have come into use. Other improvements in mechanical equipment, both below ground and on the surface, have been numerous. The practice of riding the workmen on underground trams from the bottom of the shaft towards their working places has been brought into use, and has made some extension. Above ground, engineering workshops for the repair of appliances have become important departments in the larger undertakings. The introduction of motor lorries and the improvement of highways has facilitated a centralisation both of repair work and of stores. As a result of these and other changes,

a colliery opened now is usually a different thing, in very many respects, from what it would have been if opened on the same spot, by men of equal enterprise and ability, a generation or more ago.

The large majority of our existing mines date, however, from the earlier period, and the question arises how far they have been able to adapt themselves to the new conditions. No general answer is, of course, possible. The answer will vary in each instance. But it is certain that many of the older collieries, for a variety of reasons, have not been able so to adapt themselves. It is equally certain that, with regard to a large proportion of these, owing to the limited quantity of coal that is left to be worked, or owing to the original planning of the shafts or underground roadways not being adaptable to the changed conditions, it would be an uneconomic expenditure of capital to bring them up to date. On the other hand, there are no doubt many instances in which a well-directed effort, made by experienced men, who commanded sufficient financial resources, would succeed in placing the older mines on a different footing, and would give them a new lease of life.

The Size of the Undertakings.

The question then arises whether this process of modernisation, so far as it is possible, might not be facilitated if the industry were combined into larger units. And many other reasons are advanced to show that the usual size of the present undertakings is not large enough to fit the existing conditions.

It is urged that the present economic difficulties are largely the result of small-scale production, and can only be effectively relieved if a considerable proportion of the existing mines are amalgamated to form large-scale enterprises. This is a question of great importance, which has given rise to much controversy, and which we now propose carefully to examine.

On behalf of the larger units the following considerations are advanced :—

- (1) All the economies of large-scale production become possible ; particularly in the provision of electric power, in the purchase of supplies, in maintaining the stock of stores, and in the economical running of repair workshops. In some cases the organisation of the pumping of the mines on a well-considered general plan may be facilitated. In others the question of the barriers and coal reserves, left between separate mines, may be dealt with in a more efficient manner than when each is in separate ownership.
- (2) The sales organisation of the business is in a stronger position to secure favourable prices ; tenders may be offered for large contracts ; direct sales can be made to large consumers, securing to the colliery the intermediate profits that are otherwise paid to the factor and the merchant.

- (3) Transport is facilitated, and the daily supply of railway wagons can be more easily adjusted to the production at the moment of each pit. If the enterprise is combined with blast furnaces, or other establishments, requiring a constant supply of raw material, return loads for the wagons can be arranged to some extent, and railway costs be thereby reduced. If an export trade is in question, the large enterprise is in a better position to furnish complete cargoes of the particular kinds of coal that may be needed, and the waiting time of ships at the port is reduced.
- (4) Success or failure, in mining as in any other business, depends upon the efficiency of the men who are charged with the management. A large enterprise is in a position to offer high salaries, and to secure the best brains. It is able also to employ specialists in the various branches of the manager's office, and instead of one man having to deal with engineering questions, labour questions, sales of coal, purchases of supplies, and transport, or with several among these, it is possible by division of labour to secure the expert management of each.
- (5) The process of closing obsolete pits and opening new ones, which, as we have said, is the essential feature of this industry, can be undertaken scientifically. If a large enough area of coal is being exploited, as the first pits near exhaustion others in other parts can be sunk and developed, and by a regular expenditure of capital and labour on a well-considered plan, the enterprise as a whole can be conducted continuously for a very long period, its expansion or contraction being governed by no other consideration than the economic situation from time to time. Such an undertaking may be found to have on its property in any given year, a dozen or more separate shafts; some having finished their service and being no longer used for working; others with lessening productivity, their abandonment not remote; others again in full working; others serving mines in an initial or an advanced stage of underground development; and one or more perhaps in process of being sunk. It is only for a large-scale enterprise that such continuity is possible.
- (6) In view of the growing complexity of the industry, and the probability that its inter-connection with other industries will increase and grow closer, the large colliery, able to draw upon adequate supplies of capital, is more likely to succeed in adapting itself to the needs of the time.

On the other hand, it is contended that in many cases these considerations do not apply; that the economies to be effected

are in any event comparatively small ; that management, so far from being improved, may be worsened, through the unit becoming too large for efficient personal attention ; that managers with the very high capacity needed for such large enterprises will not be forthcoming ; that the men in control of them are likely to lose touch with the thousands of their workers, and relations with labour be worsened in consequence.

It is urged, further, that even if it were shown that, where a new coalfield was concerned, it would be better to plan it from the beginning in larger producing units than those that are usually found in this country, the fact remains that we are not dealing in the main with new coalfields ; that the smaller collieries do in practice exist, in large numbers ; that their lay-out underground often does not allow modernisation and cannot now be altered ; and that, with regard to such matters as the centralisation of power-supply, of repair shops, or of administration, there would be involved a fresh expenditure of capital which may often not be justified in the circumstances of the case.

Finally, it is contended by those who hold this view, that even if there be a balance of advantage in favour of the large unit, when purely economic calculations of a general kind are alone taken into account, this would be more than neutralised if individual colliery companies were forced by some outside authority to amalgamate against their will. In the first place, the physical conditions may not be favourable. They may appear to be similar on a map, but in fact the geological conditions, in particular cases, may make the interest of the different undertakings quite distinct, or even antagonistic. In the second place, the personal element must be taken into account ; individuals who, for a long period, have been identified with particular enterprises, may not be ready to work harmoniously with partners not of their own choosing ; and internal dissensions may do more harm to the combined enterprise than large-scale production may do it good. Thirdly, there are difficult financial questions involved ; and when amalgamations are effected between collieries of different standards of efficiency, of different stages of development and of differing degrees of commercial success, injustice may be done and well-founded dissatisfaction may result. Consequently, it is said, the grouping of collieries should be left to come of itself. If there is a distinct economic advantage to be gained, self-interest will bring it about. If it has not yet been effected in particular cases, it is because the disadvantages outweigh the advantages.

The Questions at Issue.

The questions at issue resolve themselves into these :—

- (1) Is a greater degree of combination economically better ?
- (2) If so, is it practicable to effect it at this stage of the history of the industry ?

- (3) If it is, is it likely to be effected voluntarily by the industry itself ?
- (4) If not, is outside action possible ? And, if applied, would it have indirect effects for harm that would neutralise any direct advantages ?

1. Is further Combination Desirable ?

With respect to the first question—whether larger units than the present would be better—much evidence was taken by the Coal Industry Commission of 1919. We have been desirous not to spend any part of the limited time available for our inquiry in repeating evidence already obtained at no distant date, and we have therefore been content to take into consideration the views then expressed, rather than to summon the same or other witnesses to give further evidence on the same points. We find that there was a consensus of opinion expressed by the expert witnesses, who appeared before the previous Commission, in favour of larger units than those which now frequently prevail. Most of these witnesses qualified their view by saying that the size of the most efficient unit was necessarily subject to limits, and that much harm might be done if it were made too large. But in the main Sir R. Redmayne (Q. 5208–9), Mr. (now Sir) Arthur Pease (Q. 7852–3), Mr. C. E. Rhodes (Q. 16766–7), Mr. Edmund Hann (Q. 18723), Lord Gainford (with some further qualification) (Q. 19795 and 20096), Mr. Bramwell (Q. 21337), Mr. Thorneycroft (Q. 21355), Sir Hugh Bell (Q. 26293), Professor George Knox (Q. 26402–11) and Sir Lionel Phillips (Q. 26577)—all entitled to speak on such a matter with high authority—held the opinion that benefits would be obtained in a number of cases if the industry were worked by undertakings on a larger scale. The only expert witness of note who spoke in a contrary sense was Mr. F. Parker Rhodes, a mineowner.

Of the witnesses who appeared before us, Mr. Charles Markham, himself the head of one of the most important combinations in the industry, favoured the larger units ; as also did Sir Richard Redmayne, whose lifelong experience in the industry has led him to form a strong opinion on the point.

On the other hand, the witnesses who appeared before us on behalf of the organisations of the mine-owners, the mining engineers and the mine managers, were inclined to attach no great importance to the advantages of large-scale production, and to emphasise the difficulties that would be involved in changing the present state of things. It is evident, however, that in this, as in other matters, these bodies could not fail to be influenced by the controversy, that has long been proceeding, on the fundamental questions relating to the organisation of the mining industry. Of the four reports presented by members of the Commission of 1919, two advocated the nationalisation of the mines, and one the compulsory grouping of the undertakings into

a small number of large district combinations. It was not surprising, therefore, that the representatives of the owners, the engineers and the managers, should be more concerned at the present time to oppose changes which they are sincerely convinced would be injurious, not only to the industry itself but also to the nation as a whole, than to suggest the necessity of large reforms in the existing system.

Inquiry into Colliery Results.

The expert opinion that was previously expressed, as to the general advantage of larger units of production, is supported by examination of the actual results of colliery working. With the assent of the Mining Association and the Miners' Federation we obtained from the Joint Accountants, who act under the Wages Agreement, a special statement for each of the 600 odd undertakings making returns for the purposes of that agreement. Those statements show the working results, in respect of tonnage raised, proceeds, costs, profits and output per man-shift, during each of four recent periods; namely, the year 1923, the first four months of 1924 (before the new wages agreement of that year), the last eight months of 1924, and the first six months of 1925. These statements proved to be of extreme value. A long series of tables based upon them is printed in Appendix No. 18, and a summary of the main features is printed in Section 3 of the Annex immediately following this report. Here we give two typical tables presenting in broad outline, for one of the periods in question, the relation between size of undertaking and working results.

In each table the undertakings are grouped by size; that is to say, by the yearly rate of their total output of coal commercially disposable. Undertakings producing at the rate of less than 5,000 tons a year are shown separately; no importance attaches to them, as they consist largely of undertakings in operation for only a part of the period, although it is interesting to note that they include also one or two that made substantial profits.

The first table shows, for each such group, the number of undertakings, the tonnage raised in the first six months of 1925, what percentage this represented of all the tonnage raised, the average output of coal per man-shift and the average proceeds, costs and profit or loss. This table brings out at once the relation between the size of the undertakings and their efficiency.

Table 5.

WORKING RESULTS OF COLLIERY UNDERTAKINGS OF VARIOUS SIZES.

Great Britain—January to June, 1925.

Yearly Output of Undertaking, 1,000 Tons.	Number of Undertakings.	Tonnage Raised.		Output per Man-shift.	Proceeds.	Costs.	Profit (+) or Loss (-).
		Total 1,000 Tons.	Percentage of Total.				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Cwts.	Sh. per Ton.	Sh. per Ton.	Sh. per Ton.
Less than 5 ..	10	32	—	12·78	23·51	32·01	— 8·50
5 and under 200	307	27,360	12·7	16·22	19·02	20·23	— 1·21
200 „ 400	126	36,394	16·9	17·05	18·43	19·21	— 0·78
400 „ 600	72	35,118	16·3	18·34	17·90	18·04	— 0·14
600 „ 800	28	19,132	8·9	18·86	17·58	17·82	— 0·24
800 „ 1,000	20	17,992	8·4	18·68	17·52	17·65	— 0·13
1,000 „ 2,000	42	56,280	26·2	19·66	17·77	17·49	+ 0·28
2,000 and over	8	22,744	10·6	19·76	17·39	17·11	+ 0·28
All ..	613	215,052	100·0	18·32	17·98	18·23	— 0·25

Note.—The tonnage referred to throughout is tonnage commercially disposable, except in column 5, where the figure is that of total coal (pithead weights) produced per man-shift worked, including mines' and miners' consumption. The total tonnage of commercially disposable coal raised by all mines in the period of six months was 113,250,000, so that the mines included in the table cover about 95 per cent. of the whole.

Looking first at column 5, the output per man-shift is seen rising with almost complete regularity from 16½ cwts. in the smallest class of undertakings, producing less than 200,000 tons a year, to 19½ cwts. in the largest group, producing 2,000,000 tons and over. Costs of production per ton (column 7) fall with absolute regularity from 20·23 shillings, per ton commercially disposable, in the smallest group, to 17·11 shillings in the largest group—a difference of more than 3s. a ton. The difference of costs is partly offset in the particular period under review by an opposite tendency in respect of proceeds. The smaller undertakings are able to get at the pithead a larger price for each ton that they sell. In spite of this advantage, which may be due either to the fact that the smaller undertakings are working special qualities of coal, or are near good markets, the larger undertakings remain substantially more profitable on balance. In the particular period under review, when undertakings as a whole show an average loss of 3d. per ton, the two groups of small undertakings (under 200,000, and between 200,000 and 400,000 tons) show losses of 1s. 3d. and 9d. respectively, while the two largest groups each show a small profit. Had the two groups of small undertakings

been left out of account altogether, the ascertainment would have shown over all a small profit instead of a loss, even in this period of exceptional depression.

Such facts, however, are not peculiar to a period of depression. A similar table for 1923 would show the same increase of output per man-shift, and fall of costs, in passing from small to large and to larger undertakings. It would show between the smallest and the largest class nearly the same difference of output (over 3 cwts. per man-shift), a less difference of costs (about 1s. 6d. in place of 3s. per ton), but an even greater difference of profits (over 2s. in favour of the large undertakings). The only substantial difference is that in 1923 the gross proceeds of all classes are much the same.

The facts underlying Table 5 are presented in another way in Table 6, which, for each of the same size groups, shows the numbers of undertakings making losses or profits of varying degrees, from a loss of 7s. and over to a profit of 7s. and over per ton.

Table 6.

LOSSES AND PROFITS BY SIZE OF UNDERTAKINGS.

Great Britain—January to June, 1925.

Yearly Output of Coal Disposable Commercially. 1,000 tons.	Total No. of Undertakings.	No. of Under- takings making a Loss per ton of					No. of Under- takings making a Profit per ton of				
		7s. and over.	5s. and under 7s.	3s. and under 5s.	1s. and under 3s.	Under 1s.	Under 1s.	1s. and under 3s.	3s. and under 5s.	5s. and under 7s.	7s. and over.
Under 5 ..	10	5	-	2	-	1	1	-	1	-	-
5 and under 200	307	28	16	39	73	50	33	48	9	5	6
200 .. 400	126	2	5	13	39	28	10	14	14	1	-
400 .. 600	72	-	-	2	25	15	14	12	4	-	-
600 .. 800	28	-	-	-	9	8	5	4	2	-	-
800 .. 1,000	20	-	-	-	6	8	2	2	-	-	-
1,000 .. 2,000	42	-	-	2	10	6	8	15	-	1	-
2,000 and over ..	8	-	-	-	1	3	1	3	-	-	-
Total ..	613	35	21	58	163	119	74	98	32	7	6

It will be seen that practically all the heavy losses are confined to the smaller undertakings. Of the 114 undertakings altogether which made losses of more than 3s. a ton, 110 had a yearly output of less than 400,000 tons, and only 4 had a yearly output of

more than 400,000 tons. A similar concentration of the heavy losses upon the smaller undertakings is found in each of the periods examined, although the general level of profit or loss naturally rises and falls according to the economic condition of the industry at the time.

Thus, in 1923* when the average profit for all undertakings was 2s. 1½d. per ton, 120 undertakings lost 1s. or more; of these 113 were under, while 7 were over, the 400,000 ton line of yearly output. In the first four months of 1924, when average profits had risen to 2s. 10d. a ton, 124 undertakings still made losses, small or great; of these 110 had a yearly output under, and 14 a yearly output over, 400,000 tons. In the second half of 1924, when the average profit was 3d. a ton, 118 undertakings lost 3s. or more; of these 112 had a yearly output under, and 6 a yearly output over, 400,000 tons. In the first half of 1925, when there was an average loss of 3d. a ton, 114 undertakings lost 3s. or more; of these as stated 110 had a yearly output under, and 4 a yearly output over, 400,000 tons.

In each of the four periods accordingly, there are in the neighbourhood of 120 undertakings with results about 3s. a ton worse than the average, and in each period practically the whole of these markedly unsuccessful undertakings are below the 400,000 level of output. The small undertakings thus defined as markedly unsuccessful are in each period about one quarter of all the small undertakings and produce about 5 per cent. of all the coal. It is interesting to note that in 1925 some of the smaller undertakings are also among the most profitable. These are clearly undertakings which survive through some exceptional advantage—either nearness to a large market, or having coal that is peculiarly valuable or easily worked. On the other hand, the smaller undertakings in one way have done actually worse than is shown, in so far as a number of them have closed between the good time of 1923 and the bad time of 1925.

In another way also it seems certain that the figures cited understate the position; they leave out, on the one hand, certain large undertakings of well-known profitability, which have not been accustomed to make returns for the purpose of the wages ascertainment; and, on the other hand, many small undertakings whose output per person employed is low. The wage agreement returns relate only to 600 odd undertakings out of 1,400. The other 800 are mainly very small; they fall mostly into the class employing less than 50 men, whose output in 1924 has been given elsewhere as 177 tons per head as compared with an average of 220.

The results shown above in barest outline for the country as a whole need to be followed up by detailed examination, in particular by considering separately the individual districts, by taking some account of the age of the undertakings, and by taking account of the possible differences between undertakings which are large because they include one or two large mines, and those that are a combination of many small mines. All these points are

* See Table 30, page 263.

considered in Section 3 of the Annex printed at the end of this Report, and full material for further inquiry is presented in Volume 3 of our Report. None of this detailed examination in any way affects the main conclusion presented above as to the relative lower efficiency of the smaller undertakings as producing units. In district after district, with only here and there an exception, the undertakings of the two lowest classes, between 5,000 and 200,000, and between 200,000 and 400,000 tons, are worse than the district average, in output per shift, in costs, and in profitability.

Experience in South Yorkshire and Abroad.

We would offer as an interesting illustration of the advantage to be gained by large-scale production, the administration and experience of the Doncaster Collieries Association, which is a company formed by the Brodsworth, Bullcroft, Hickleton, Markham Main and Yorkshire Main collieries, and acts on their behalf. This Association controls an output of some five million or six million tons per annum, and its sales of coal and purchase of materials amount to an annual turnover of some £5,500,000. Mr. C. P. Markham, who is the head of this combination, states that the advantages gained by the concentration of such a large business under a single control are very great. A higher technical staff can be employed, consisting of mining engineers, surveyors, electrical engineers, mechanical engineers, draftsmen, and house-building experts. The advantages, which we have mentioned in a previous paragraph, from the centralised control of electric power supply, from the efficient organisation of railway and shipping transport, from saving intermediate profits on sales and securing rebates on large-scale purchases, are all realised in practice, and contribute greatly to the prosperity of the combined undertakings. We cannot doubt that what has been successfully achieved in this instance, and in one or two others in different parts of Great Britain, might be imitated in many more.

It is a fact of some significance that the Westphalian coalfield, the principal European competitor of our industry, is organised in this respect very differently from our own. The output of that field in normal years is in the neighbourhood of a hundred million tons, but the number of separate undertakings responsible for this large output is only seventy.

In the reconstructed coalfield of the Pas de Calais, again, the units of production are of the same order of magnitude as in Westphalia. In 1925 an output of twenty million tons was produced there by only sixteen undertakings.

We have arrived at the definite conclusion on the first of the four questions which we have formulated, that the size of the undertakings usual in the coal industry in Great Britain is not economically the best; and that there are great advantages in large-scale production which are not now being realised.

2. Are Amalgamations among the Older Mines Desirable ?

With regard to the second question, whether it may not be too late now to effect amalgamations in our older coalfields, we observe that several important fusions, or amalgamations by purchase, have in fact been made at various dates in the present century. The cases are familiar to those who are acquainted with the industry. With few exceptions, there are no differences of opinion as to the utility of these combinations, and if anyone were now to propose to dissolve them into their original parts, it would be universally regarded as a retrograde step.

At the same time we consider that it has been established that any general measure of compulsory grouping on uniform or arbitrary lines is open to grave objection. We have outlined the arguments that are advanced by the opponents of such a measure, and we think that they are cogent. We should be unable to recommend a policy of amalgamation if it were to take that character.

The answer, then, to the second question is—that a number of amalgamations have in fact been effected in the older coalfields, and with advantage ; that they are therefore clearly not impracticable ; but that not in every case is amalgamation desirable ; and that to compel parties, who object to it, to work together in a combined undertaking would be a mistaken policy.

3. Is the Initiative of the Industry itself Sufficient ?

If it is agreed that some amalgamations are desirable and others not, what is the answer to the third question—can we rely that those which are desirable will come about by the action of the industry itself ?

Here the experience of more recent years has not been encouraging. The process of fusion appears to have come almost to a standstill. There have indeed been two important combinations affecting the anthracite coalfield in South Wales, which amalgamated into two groups a number of separate undertakings ; but apart from that the information at our disposal indicates that little has been attempted in any district except Scotland and the South Wales bituminous coalfields, and even in these districts the percentage of collieries known to have amalgamated in recent years is not appreciable.

It is contended that the conditions of the trade in recent years have not been propitious for combinations of this character, which usually involve the provision of new capital. The fact, however, remains that new capital has been forthcoming in large sums, since the war, and is being invested even now, in the development of many of the collieries, and in sinking new pits. We must look mainly elsewhere for the slowness with which the process of concentration is being effected.

There are undoubtedly serious obstacles, which in individual cases hinder fusion. Which of the old concerns is to be predominant in the new combination? Which of the directors and the managers are to be displaced? What is the valuation to be put upon each of the properties? How much above its market value at the moment are the promoters of the new scheme ready to pay to the owners of an adjacent colliery, rather than surrender the completeness of their project? And, a not unimportant factor in some cases, is it certain that the owners of the royalties will be ready to grant the leases, longer in time and more extensive in area, that may be necessary to make the larger enterprise remunerative? When to all these difficulties is added the *vis inertiae* which hampers all new projects in all old-established industries, we have an explanation of the slowness of the movement.

In the memorandum of evidence presented to us by the Mining Association on January 12th, 1926, it was stated: "It may well be that there are larger groups at present in existence operating on the whole more efficiently than collieries which are singly owned. This, however, is a result which might be expected, because it will be found that these groups owe their existence to the more efficient, resourceful and enterprising persons who have naturally sought an outlet for their ability in the line of business in which they are expert by increasing the size of the undertakings which they control."* No doubt this is correct; but it is impossible to suppose that there have never been, or are not now, similar persons in other localities who would be ready to show similar enterprise, but who are stopped from doing so by the unwillingness of the existing owners of neighbouring collieries to consent to their own absorption. The fact cannot be ignored that the coal industry has passed in recent years through times of severe economic pressure; yet the adoption of large-scale production, which is plainly one means among others of meeting that pressure, has not taken place on any adequate scale. There is every possibility, indeed probability, that if the present crisis should pass, its lessons also will be forgotten.

If, on the other hand, the pressure continues, no doubt some enterprises will become insolvent. Losses can be suffered for a time, but not indefinitely. Those that cannot carry on may be taken over by others, and at a low valuation. Any policy of amalgamation which would hinder this process, which would saddle the more efficient businesses with less efficient ones, and require them to be absorbed at a valuation inflated above their real market price—such a policy, far from promoting, could only hamper the progress of the industry as a whole.

But this process of natural absorption can also not be relied upon to effect, of itself, all that is needed. If nothing more were done than to leave economic forces to work themselves out, it would probably

* Evan Williams, Annex A, para. 62.

be found twenty years from now that over a large proportion of the area the same conditions as those of to-day would still be prevailing ; the number of separate enterprises might have been reduced, but not substantially ; there would still be operating very many small-scale undertakings just on the margin between success and failure, closing down in bad times and opening again when conditions improved, not remunerative enough, on the average of years, to attract the investment of adequate capital, offering to the workers conditions of employment on the lowest level that the law, or the trade agreements, allowed. Those who are charged with the care of the public interest have the duty to take such measures as will obviate these eventualities.

Our conclusion on the third point is—that while in some cases fusions or absorptions which are desirable have taken place, and in other cases fusions and absorptions would be attended with a balance of disadvantage and should not take place, we cannot doubt that between these two classes there are a large number in which such amalgamations are desirable, have not yet been effected, and are not likely to be effected, if the matter is left entirely to the action of the parties directly concerned.

4. Are Further Measures Desirable?

There remains the fourth question—whether outside action is practicable, and whether it could be given a form which would avoid the dangers that might attend it.

With the subject of Nationalisation, which has a close bearing upon this issue, we shall deal in the next chapter. We would express here the following conclusions at which we have arrived, on the basis that private enterprise continues.

- (1) The fusions that are desirable must be effected with great care, and with intimate knowledge of the physical and financial considerations that are involved in each case ;
- (2) Any measure that fixed a general rule of size or output, and applied it uniformly without regard to the individual conditions, could only be mischievous ;
- (3) Amalgamations, where they are made at all, should in most cases be complete, but might sometimes be rather of the nature of the combined action of separate businesses for power-supply, co-operative selling or other purposes ;
- (4) The necessary elasticity, and harmonious working, could best be obtained if the initiative came from within the industry itself ;

- (5) Where one or more undertakings in an area desired to effect an amalgamation, but others, whose co-operation was necessary, refused, or demanded unreasonable terms, there must be power in the public interest to over-ride such opposition; the action to be taken in such a case should rather be of the nature of securing the transfer of leases from the present holders to the new combination, at a valuation such as would be reasonable in the circumstances, than any attempt to make the parties work together against their will. It is more practicable to combine mines than mine-owners.

There may possibly remain cases where combinations are desirable, but where the mine-owners directly concerned show themselves incapable of initiative, while there are other owners, whether in the locality or from elsewhere, who are willing to work the mineral on progressive lines. We have considered whether, in such cases also, a measure to secure the transfer of the leases is necessary. Such a measure might give rise to a feeling of insecurity in many quarters, that might prove an obstacle to progress. And its application might in practice be found to be unnecessary, since the present lessees may not in fact show themselves lacking in initiative to the extent supposed. On the other hand, if there is no such resource available in the background, the other provisions might prove ineffective to achieve their purpose in a number of instances.

On the whole, we recommend that the legislation that would be needed to give effect to these proposals in general should include a provision of the character described; but that this provision should not come into effect upon the passing of the Act, but at a specified later date, perhaps after three years; and then only if a statement is made by the Mines Department that it is satisfied that it is necessary in the public interest to bring it into operation. During the interval the situation will have become clearer, and it will be seen whether the application of this somewhat drastic provision is really required. To postpone its enactment until that time, however, might be to invite parliamentary difficulties, and result in a further postponement which might be found to be disadvantageous.

We do not suggest that, in any class of cases, if no private undertaker is forthcoming, the State should itself work the mines. Whatever difference of view there may be as to the merits of the general nationalisation of the mines of the country, there can be none as to the disadvantage of applying public administration only to those cases where the prospect of a remunerative result is so doubtful that private enterprise refuses to consider them.

These, then, are the principles we think should be adopted. We propose in a later chapter that the mineral itself should pass into the ownership of the State, and that a Coal Commission

should be established, under the authority of the Mines Department, to administer the property. Experience will show how far the application of these principles would rest with the Department itself and how far with the Coal Commissioners.

With regard to the existing groups of mines which are in separate ownership, but where amalgamation is desirable, three classes of cases are likely to arise:—

- (a) Where the present owners are in agreement. Here a scheme would be submitted to the Coal Commissioners as lessors, who, having satisfied themselves that it was adequate, would issue a combined lease of the character required ;
- (b) Where the parties are agreed in principle, but are unable to agree as to financial terms or other matters. They should be entitled to have recourse to the Department or to the Commissioners, as may be decided, for the appointment of arbitrators in such manner as the parties desired ;
- (c) If one or more of the parties desired amalgamation, but there was not unanimity. In this case they might apply for a scheme to be prepared, in consultation with them, and after the holding of a local Inquiry. Legislation will be required to enable orders to be made for the compulsory transfer of interests when shown to be necessary, subject to an appeal to the Railway and Canal Commissioners on questions of valuation.

CHAPTER VI.—NATIONALISATION OF MINES.

The main proposal made to us by the Miners' Federation for improving the economic condition of the industry was that it should be acquired by the State and conducted on its behalf. The reasons for the nationalisation of the mines that were advanced in the Memoranda presented to us on the subject, and in the evidence of witnesses, may be summarised as follows :—

Reasons advanced in favour of Nationalisation.

It is urged that the existing organisation of the industry has serious defects. These defects are harmful to the national interest. They are specially harmful to the interests of the miners themselves, since they have a prejudicial effect upon their wages, their hours of work, their safety and comfort, and the regularity of their employment. Reorganisation is therefore necessary. In order that it should be satisfactory, it is held to be essential that the representatives of the miners should be given a large share in the general oversight and in the detailed management of the mines. If that were done, the improvements that are necessary would be more freely suggested and more readily adopted. This reorganisation and this participation cannot, it is said, be fully attained so long as the mines are in private hands, and their conduct dependent upon considerations solely, or mainly, of profit-making : therefore they should be nationalised.

There are other considerations, which were not advanced in the evidence given before us, but which are known to contribute to the support of this proposal. It is held that the payment of large annual sums to individuals in respect of a purely natural product, the mineral itself, is wrong in principle. Nationalisation would end the private ownership of royalties as well as of mines. Some expect that by that means a fund would be furnished, which would help in bettering the miners' conditions.

Many anticipate that, under nationalisation, the workers in the industry would have an assured position, like that of postal servants, with security of wage and regularity of work.

There are also some who approach the problem, not as an isolated question, but as part of the general question of the right manner in which industry as a whole should be conducted, holding as a principle that it should be conducted by the State in the interest of the community. These favour the nationalisation of the mines, not only on its own merits, but as a step towards that end. They would be prepared to face risks of financial loss or of lessened efficiency for the sake of testing and, as they are convinced, of vindicating, the general principle. It would, however, be beyond our province to examine the broad issue of Socialism.

Our duty is to consider the nationalisation of mines as a concrete, practical proposal for the control and management of this particular industry. It was in that spirit that the proposal itself was placed before us.

The Scheme submitted to the Commission.

Nationalisation may have different meanings. A definite scheme was laid before us by the Miners' Federation. We were informed that it embodied the general conclusions reached by a Joint Committee representing that body, the General Council of the Trades Union Congress, the Executive Committee of the Labour Party, and the Executive Committee of the Parliamentary Labour Party. (See Memoranda of Evidence submitted by Mr. Tawney at the 33rd Sitting of the Commission.)

We have therefore regarded it as superseding previous schemes, such as that of the Bill presented to Parliament on behalf of the Miners' Federation in 1924 and again in 1925, and we have not examined those earlier plans in detail.

This scheme contemplates the nationalisation in the first instance of the mineral, of the collieries, and of the coke and by-product works carried on in conjunction with them. At a later stage, the extension of the principle to industries connected with the generation of power and the utilisation of coal would demand consideration. It is proposed to establish a Power and Transport Commission under the general supervision of the President of the Board of Trade, which would supersede the present Electricity Commission. This body would consist of six full-time Commissioners representing expert knowledge on coal, electricity, gas, transport, commercial questions, and labour questions, with a Chairman. The functions proposed for the Power and Transport Commission would be the following:—

- “(a) To survey the problems of power and transport development as regards both needs and possibilities.
- (b) To undertake and administer the inter-connection of generating stations and the trunk line transmission of power.
- (c) To lay down conditions governing power and transport undertakings, both public and private.
- (d) To co-operate with the Department of Industrial and Scientific Research in the promotion of research into power production and coal by-products and kindred questions.
- (e) To undertake or to arrange for the commercial application of the results of research into power and transport problems.”*

There would be in addition a National Coal and Power Production Council, under the Presidency of the Secretary for

* Tawney, Memo. 5, para. 8.

Mines or his deputy. This body would consist of, say, six executive and administrative officials elected by their respective organisations, and six miners and by-product workers similarly elected, with two representatives of the Power and Transport Commission. Expert officials would sit with them in an advisory capacity. This would be the body that would be charged in effect with the actual conduct of the mining industry. Under its authority would be constituted Provincial Councils, consisting of a Chairman and Vice-Chairman appointed by the Coal and Power Production Council, with six representatives of the manual and manipulative workers, and six representatives of the technical and administrative workers, together with official advisors. These Councils would appoint the Chief Officers of the districts, subject to the approval of the Central Council. At each mine there would be established a Pit Committee, consisting of the Manager, under-manager and commercial manager, two members nominated by the Provincial Council, and two members elected by the workers employed at the mine. It is intended, however, that the final responsibility for the conduct of the mine should rest with the manager, subject to the decisions of the Provincial Council.

In addition to these bodies, which would provide the constitution for the industry itself, it is proposed to establish a Consumers' Council. This would consist of representatives of the employers and workers belonging to industries that use coal and power. Local authorities, co-operative societies, and a body to be constituted for dealing with the export trade, would also be represented on the Consumers' Council. This body, like the other, would be under the presidency of the Secretary for Mines or his deputy. It is intended that the Consumers' Council should consider questions of prices, transport rates and methods, and methods of distribution. It would play an important part in the determination of the miners' wages.

The interest of the present owners of the collieries would be bought out at the actual present cash values of their properties, Government Stock of equivalent amount being given in exchange. The Committee on whose behalf these proposals were submitted was not of one mind with respect to the principle of compensation for mineral royalties, the Miners' Federation itself being opposed to it. Further sums for the development of the industry would probably be provided in the first instance by means of a public loan carrying a Government guarantee. Subsequently the coal and power industry would be expected, as a rule, to provide its own capital from profits. The export trade would be conducted by a single authority, either a Commission consisting of, say, three men with special knowledge of that trade, or a joint stock company, consisting in the main of existing coal exporters, operating under definite limitations of the rate of dividend payable and such other regulations as the State might wish to impose.

Such were the proposals submitted to us, which we now proceed to examine.

1. *Nationalisation in relation to the character of the Industry.*

We are not dealing here with a simple, uniform, self-contained industry. On the contrary, mining is remarkable both for its diversity and for its close inter-connection with other industries. We have dwelt upon these aspects in the chapters of this Report which deal with the Structure of the Industry and the Utilisation of Coal. They have been emphasised by the Miners' Federation themselves in the evidence submitted to us. "No industry," they say in the Memorandum submitted by Messrs. Davies and Hall (para. 36), "presents such varied characteristics"; if agriculture be excepted, we think that this assertion is true. Again, they state that mining "from being a coal extracting industry should become increasingly a coal utilising industry"*; "Modern development of industry is making it more and more impossible to treat coal mining as something completely separate and with only accidental connections with other industries . . . It appears that the typical coal-mining concern is becoming more and more a complex unit. In some cases it is becoming a unit which so far transcends ordinary industrial divisions that it can only be described as a heavy industry unit. This does not apply to all the pits, it is true, but in measuring an industry the workmen feel that it is the modern and most developed form of the industry which must be taken as the type."†

We have given the reasons why we fully concur in this analysis. We believe that in the future coal mining will be found to have become an integral part of a great industrial complex, which will comprise also electricity, smokeless fuel, gas, oil, chemical products, blast furnaces, and possibly other activities.

But these are features which make the mining industry particularly unsuitable for conduct by the State. Standardisation, to any marked extent, is impossible. Mining is less uniform even than other producing industries; far less so than distributive or transport services, or than such a service as the generation and supply of electricity. Its results are uncertain and indeed speculative. A willingness to experiment and a readiness to take risks are essential.

There are some who will hold that these qualities would be found not less under nationalisation, or perhaps even more, than under the existing system. The best of the present managers would be continued in employment, and if new men were introduced they might be of a higher standard of capacity than those whom they replaced. Others will be of the opinion that the control of the industry by authorities mainly elected by constituencies of producers and consumers, and the fact that the risks that would be taken would be risks with public money, would destroy initiative.

However that may be, we are clearly of opinion that the variety and freedom of private enterprise are more likely to

* Tawney, Memo. 4, para. 5.

† Davies and Hall, paras. 100-1.

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conduce to the progressive development of this particular industry than control by the State.

With respect to the interlocking of mining with other industries, it must be noted that the scheme which we are examining does not propose to nationalise, at this stage or for an indefinite time in the future, any part of the vast combination which is gradually being evolved, except the mines themselves and those coking-plants which are situated at the collieries. But if mining were nationalised and the other associated industries remained in private hands, a new frontier would be drawn across the domain. Integrations that have already been effected would have, in fact, to be broken up. Probably not less than one-fifth of the coal production, other than for export, is already carried on by companies which conduct at the same time blast furnaces, or coking enterprises in other localities, or other associated industries. It is proposed to sever into its component parts all this organisation, the creation of years of effort and enterprise. By removing these mines into State ownership, the very sections of the industry which already approach the standards that are likely to prevail in the future, would be the most injured. Existing combinations would be disintegrated, and a serious obstacle would be raised against further integrations.

It is true that the plans relating to capital electric power stations that have been recently announced by the Government propose a considerable measure of public control over electric supplies. But they do not contemplate the nationalisation of electricity. In any case, electricity is only one element among several that are here in question, and a closer connection of mining with electric supply, even if it were effected, would not compensate for the separation of mining from the other industries with which it is already more intimately connected, and with which it will probably become combined in an even closer degree in the future.

2. Relations of Finance and Management.

The second objection arises from the relationship proposed in the scheme between finance on the one hand, and management on the other.

We have not attempted to make any close estimate of the total capital sum that would be involved, which is a matter of some difficulty. But if the mines were bought, together with the ancillary works adjacent to them, if the royalties were paid for, if the mineral wagons, other than those belonging to the railway companies, were purchased, and if a moderate provision were added for immediate development, it is probable that the amount needed would not be less than £350,000,000. This large sum could be provided only by the use of State credit. It is proposed that some form of Government security shall be issued as an equivalent of the money that would be required. The obligation would be placed upon the Treasury, by statute, to

find, year by year, the interest, and possibly a sinking fund, for the service of this debt.

The scheme provides also that "the industry will be required to pay its way. There will be no question of Parliament granting subsidies."* It will be remembered, however, that the actual management of the industry is to be vested in the Coal and Power Production Council, and bodies subordinate to it, acting in consultation, in certain important matters, with the Consumers' Council. These authorities are all to be mainly elective. It is intended that the sums required to enable the Treasury to meet the service of the debt shall be "a first charge upon the industry."† In point of practice the managing authorities could not make it so. They must necessarily give priority week by week to the payment of wages and to the purchase of materials. It is only the profits which would be the safeguard of the Treasury.

The scheme contemplates further that the Power and Transport Commission, a body of six officials appointed by the Government, shall have the duty of ensuring that the Coal and Power Production Council shall in fact balance its budget and make the payments due to the Treasury. If this could be done only by raising prices, or lowering wages, or closing unremunerative mines, these steps, it is said, would have to be taken.

In dealing with the relationship, under nationalisation, between finance and management there are two courses open. The first method is direct management by the State. Under it a Minister of the Crown would conduct the industry, subject to such delegation as he might choose, but always reserving to himself the final authority. This course is open to the criticism that it involves bureaucratic control, and will fail to associate the representatives of the workers with the effective management.

The second method is management by representative bodies, drawn from the industry itself or from other classes, such as the consumers; those bodies being self-dependent in matters of finance, and responsible to their constituents, as local authorities are responsible, for the avoidance of losses. This method is open to the objection that they could not in fact be self-dependent; the financial transactions involved are too large to be undertaken except by the use of State credit.

The advocates of nationalisation consider that the plan now proposed will obviate the difficulties that severally attach to these two courses. It would give on the one hand the financial assistance of the State, while retaining on the other a large measure of self-government for the industry. It would aim at keeping the industry out of the political arena and avoiding bureaucratic control, while at the same time placing upon the State the duty of finding the funds that are required.

* Tawney, Memo. 5, para. 47.

† Tawney, Q. 16908.

We appreciate the objects that are in view, but we do not think that they can be attained. The duty of safeguarding the public purse might be formally laid upon the Power and Transport Commission, but there must be grave doubt whether they could, in practice, perform it. A commission of officials would be called upon, in certain circumstances, to over-rule independent elective bodies. The one would be acting in the interest of what may be summed up in the term "sound finance"; the other would represent the forces that make for what may be termed "better conditions." It is the declared intention of the authors of the scheme that the former should prevail. We can feel no assurance that in fact it would. But if the plan did not break down for that reason, and if, in times of controversy, the official Commission succeeded in over-ruling the elected bodies, then the system of self-government, which it is one of the main purposes of the scheme to create, would be overthrown. Nothing could be worse than to establish nationalisation, largely for the sake of satisfying the miners' desire for a share in the control of the industry, and then for the miners to find, at the first crisis, on a point vitally affecting, perhaps, their standard of living, that the self-government was a deception, that the real control rested with the Government of the day, and that the elaborate construction of councils and committees with all their carefully chosen membership, was, at the test, powerless and futile.

The essential contradiction which is embodied in the scheme proposed to us is clearly seen if the position assigned to the Minister of Mines is considered. Like other Ministers he is responsible to Parliament. If the representatives of the tax-payers should disapprove of the manner in which the industry is administered, whether on financial grounds or on any others, they can secure the resignation of the Minister or a change in his policy. But under this scheme the Minister is also to be the Chairman of two bodies, by whom questions of wages and prices are to be settled. These bodies are not appointed or controlled by him; their members are almost all elected by independent constituencies. The Minister therefore may receive the instructions of Parliament, but he has no power to give effect to them. If, however, the scheme were to be modified in order to meet this criticism, and were to give him that power, then, we repeat, its essential character would be changed, and it would become a plan for direct State control. As it stands, the position in which the Minister for Mines is to be placed leaves him as the embodiment of the inconsistency of one authority being given the right to manage, another being left with the liability to pay.

We cannot find here a basis for a vast industrial undertaking. We cannot afford to rely merely upon the hope that, out of a spirit of goodwill and public responsibility, the independent bodies which will conduct the industry will fully safeguard the interest of the Treasury.

3. *The Regulation of Prices and Wages.*

The third objection to the proposal relates to the method suggested for the regulation of prices and wages. The scheme proposes as its organ of control a Consumers' Council, representing employers and workpeople in industries consuming coal, local authorities, co-operative societies and other distributing agencies. This Council is to have an equal voice with the Coal and Power Production Council, which is responsible for the direct management of the industry, in the discussion both of wages and of prices. If the two councils cannot agree on wages, there may be reference to a specially constituted court with personnel and terms of reference agreed on by these parties. But it is made clear that the court cannot give a binding decision; the witnesses for the Miners' Federation recognised that even under nationalisation it would not be practicable to deny to the miners the liberty to strike. In respect of prices, if the two councils cannot agree, the final decision is to rest with the President of the Board of Trade or with a tribunal appointed by him.

This part of the scheme also appears to us to be likely to fail in its purpose. We think it most probable that the workers' representatives on the Consumers' Council would be less anxious to keep down the price of coal, than, through a sense of labour solidarity, to keep up miners' wages. Whenever it became clear, as it always would become clear, that miners' wages depended directly on the price of coal, this section of the Consumers' Council would, we believe, vote in critical issues as fellow-producers rather than as consumers.

If, however, on some particular occasion this should prove not to be so, and on a crucial issue as to the level of prices, and therefore of wages, a deadlock should arise between the Production Council and the Consumers' Council, a reference would be made to the President of the Board of Trade or a tribunal appointed by him. The situation would then be this:—On the one side would be the Production Council pressing for a price level corresponding with the wage it desired to pay, and probably aware that the Miners' Federation were prepared to strike in order to secure that wage; on the other side would be the Consumers' Council, whose constituents, whatever the decision might be, would have no option but to accept it. The situation would be fundamentally uneven. The inducement to any tribunal to incline against the consumer in order to secure an immediate settlement, even at the risk of economic damage in the future, would be almost irresistible. Nor could political considerations in such a case, however much they might be excluded in theory, be kept aloof in practice.

4. *Purchase of Uneconomic Mines.*

The fourth objection may be briefly stated, although it is of importance at the present juncture. We have given

elsewhere the grounds for the belief that considerable changes in the distribution and relative importance of our coalfields are in prospect. Only after some years will it be possible to estimate what is likely to be the permanent aspect of the British coal industry. In these circumstances, to nationalise now would mean sinking large sums of public money in the purchase of mines that ought almost immediately to be abandoned.

Whether, however, they would in fact be abandoned, having once passed into public ownership, raises a further question. The closing of uneconomic mines, always a matter of difficulty, would become far more difficult under nationalisation. There would be a strong temptation to draw upon the profits of the better mines rather than to inflict the hardships and incur the resentment involved by such an operation. The controversies recently aroused by the closing of two small Admiralty dockyards would be repeated a hundredfold, in pit committees and provincial councils, in the central councils and in Parliament.

5. *The Export Trade.*

There is a further objection to the principle of nationalising the mines of Great Britain that arises from the fact that so large a proportion of the whole product is exported. The proposal that the actual management of this trade should be in the hands either of a Coal Export Commission or of a Public Utility Corporation, removes the participation of the State only by one degree. Whichever of these two alternatives was adopted, we consider that it would not be possible in actual working to dissociate the State from responsibility with regard to the export of coal. The terms on which 60,000,000 tons were annually sold, whether directly to exporters or to some corporation, would vitally affect the interests of producers at home on the one hand, and of consumers abroad on the other. International complications would be inevitable. Such complications arose in the years following the war, when the prices charged to foreign countries for British coal, under conditions of Government control and immediately after decontrol, had a serious effect upon the attitude of European public opinion towards Great Britain. Under nationalisation, with this export trade under the real, even if it were the indirect, management of the British Government, we should be regarded by foreign countries, not, as in Napoleon's phrase, as a nation of shopkeepers, but as a nation of coal merchants. That we should in fact become, and the consequences in our international relationships could not be contemplated without concern.

Other Expectations.

These, then, are the positive objections to nationalisation. But it must be added, negatively, that several expectations that might be entertained, as to results that would follow, are not likely to be fulfilled.

There can be no assurance that labour disputes would be avoided. The advocates of nationalisation propose no more definite basis for the determination of wages than now exists. Costs of production are to be taken into account, but the costs themselves depend mainly upon wages. Negotiations would take place between the unions of the workers on the one hand and a combination of authorities on the other, but they would be essentially the same in character as the present negotiations, with the same recourse to a strike or to a lock-out as a last resort in the background. We print in Appendix No. 21, a memorandum prepared by the Mines Department which comprises the available information as to the experience of the working of State mines in other countries. It is noteworthy that in the national mines of Australia and New Zealand stoppages owing to labour disputes are very frequent.

Further, the scheme that we are considering makes, of course, no claim to satisfy the expectation which is undoubtedly entertained by many among the miners, that their conditions would be improved under nationalisation by the retention of the £6,000,000 a year, now "withdrawn from the industry," as it is sometimes expressed, for the payment of royalties. The witnesses who appeared before us recognised that payment for the mineral itself was a legitimate charge to be made, and contemplated that sums, such as are now paid to the mineral owners, should still be collected on behalf of the State.

Nor are their proposals consistent with the hope that the miner would enjoy the guarantee as to wages and regularity of employment which belongs to the classes of workers, such as those employed in the post office or in municipal services, whose remuneration is a direct charge upon public funds. It is intended that the industry should be financially self-supporting. Whether that intention would in fact be realised or not is one of the points in question. But if it is—and the advocates of nationalisation without doubt have the sincere purpose that it should be—then it follows that the miners' conditions would still be dependent upon the good or bad management of the industry and upon the fluctuations of its economic conditions.

The proposal, lastly, does not purport to offer in any degree a solution of the present economic situation. The witnesses who appeared before us on behalf of nationalisation concurred in the view that it would of necessity require a period, that would be measured rather by years than by months, before the system could be brought into being. Meantime, the immediate problem would remain to be faced, and as to the method of meeting it, nationalisation, they agreed, could of itself offer no suggestion.

Conclusion.

In discussing the proposal for nationalisation, we have confined ourselves to the precise problem before us, in relation to the industry of coal mining. There are many other

considerations, not peculiar to coal mining, which bear upon the general question of State action in trade and industry. We have not examined those considerations here, although they are by no means irrelevant. We should certainly not have felt, however, that they would have precluded us from recommending the nationalisation of the mines if the case for it had been proved. But the burden of proof is on those who advocate nationalisation. We have felt bound not to recommend it unless we felt satisfied that there was presented a workable scheme, offering a good prospect of success and of a clear economic and social gain. We have seen, however, no scheme that will withstand criticism; we perceive grave economic dangers; and we find no advantages which cannot be attained as readily, or more readily, in other ways.

For the choice of policy is not limited to two alternatives, between the industry as it now is on the one hand and nationalisation on the other. There is another course. We recognise that there is substance in the demand which nationalisation is intended to meet—the demand for large changes in the organisation, and improvements in the efficiency, of the industry, for an expansion of the miner's influence over the conditions that govern his working life. This legitimate demand we believe can be met without embarking upon an operation so vast and so hazardous. It is one of the principal objects of this Report to suggest the means.

CHAPTER VII.—ROYALTIES.

The Origin and Character of Royalties.

Whether in ancient times the ownership of minerals in England and Wales was vested in the King, or was a common right, or an incident of feudal tenure, or sometimes one and sometimes another, there is no clear evidence to show. The use of the word "Royalty," and the assertion of the sovereign rights, which still exist, in mines of gold and silver, tend to support the principle of Crown ownership. But however this may have been, "The rights of the Crown, equally with the rights of the people, have gradually disappeared before those of the private proprietors. The rights claimed by the English Crown were at first extensive. 'But in these early times,' says Bainbridge, 'the mines of tin and lead and of gold and silver were, if not the only, at least the principal, mines to which industry was directed; and by the time that industry began to extend itself to mines of coal, iron, and such like other baser substances, the spirit of liberty and of private encroachment, fostered and protected by the genius as well as by the forms of English law, occasioned the assertion by individual landowners of rights that were exclusive of the Crown. Whence it appears that in or about the year 1568, the respective adverse rights of the Crown and of private landowners became the subject of contention, and called for definition by the courts of justice.' The decision of the judges in this so-called 'great case of mines' (Queen *v.* Northumberland) was in effect 'that only the so-called royal mines (i.e. those of gold or silver) belonged to the Crown and that all the baser minerals belonged to the individual landowners.'"* The Legislature not having intervened to establish, or re-establish, the right of the Crown as representing the nation, the decision of the Courts in the time of Queen Elizabeth has been the undisputed law of the land from that day to this. Minerals have continually been bought and sold in reliance upon that law, and it is the basis of an important part of our system of taxation.

There is therefore no doubt that, if minerals which have an appreciable market value, were taken from the present owners and vested in the State, there would be a valid claim for compensation.

It is equally clear that what is called a royalty—apart from the question whether it should go to private individuals or to the public purse—is in itself a proper charge to make. The fact that the payment for the mineral is usually in the form of a charge per ton, paid annually or at shorter intervals, often leads to the assumption that it is of the same nature as a rent. But this is not so; a rent is paid for the use of a thing which endures, of a piece of land or a house; a mineral royalty is paid for the purchase

* Sorley. *Journal of Royal Statistical Society*, 1889, pp. 62-63.

of the thing itself, of a specified quantity of mineral, which is extracted from under the soil and removed once for all. The principle was authoritatively stated by Lord Cairns in the case of *Gowans v. Christie* (1873, 2 Sc. App. 273) when he said "a mineral lease is really a sale out and out of a portion of the land."

The Continuance of Royalties.

We can see no reason why this valuable commodity, a product of natural forces, the property in which was conceded long ago to the private surface-owners, should now be offered as a free gift to the persons who are engaged in the mining industry, whether as mineowners or as miners. To do this would be to redeem one act of public improvidence by substituting another. The mineowners have not at any time suggested that such a course should be taken. And if some among the rank and file of the miners may have had hopes in the past, or hold expectations in the present, that the royalties, if nationalised, would be allowed to remain for the benefit of the industry, that is clearly not the view expressed by the Miners' Federation. The point was put to the witness who appeared before us on their behalf on the question of the nationalisation of the industry as a whole, and it was definitely answered.

Q. 16,935. *The Chairman.* . . . You mention in paragraph 42 the question of royalties and say that there is a division of opinion as to whether the present owners of royalties should receive compensation but that the Miners' Federation is opposed to compensation being given. You do not say, however, whether after nationalisation any charge in the nature of royalties should continue to be collected by the State. Could you tell me what is your view with regard to that? In other words, should royalties, or rent, or payment for the mineral itself—no matter how you may choose to phrase it—still continue to be payable?

Mr. Tawney. My view is, Yes—that the State should step into the position of the royalty owner.

Q. 16,936. That it is legitimate to charge for the coal itself—to debit the industry for the value of the actual coal itself?—The State would become the proprietor of the minerals, and as such it would charge a royalty for them against the industry.

Q. 16,937. The point I have in mind is whether the present sum of £6,000,000, or whatever it may be, which is derived from royalties should be thrown into the general finances of the industry and used to raise wages, for example?—That has not been contemplated. I have never heard that suggested.

Q. 16,938. But the State itself should receive that as the future owner of the minerals?—Certainly, *qua* owner.

Q. 16,939. As representing the community?—Yes.

We proceed on the basis, then, that a charge, such as the present royalty payments, is a proper charge to be made, and that if it were diverted from the present recipients they would be entitled to compensation. We shall now consider whether it would be to the general advantage that the ownership of the mineral should be acquired by the State.

This is, of course, a question entirely distinct from that of the nationalisation of the mines, discussed in the previous chapter, and the arguments, both for and against, are to a large extent different.

The Nationalisation of Royalties.

The members of the Coal Industry Commission of 1919, while in disagreement on most of the main issues before them, were unanimous in favour of the State acquisition of all coal and associated minerals. They differed only as to the terms upon which the minerals should be acquired, three members of the Commission holding that compensation should not be paid. The reasons given in the various reports for recommending the State acquisition of the minerals were also broadly the same—namely, that a private and divided ownership of minerals did in fact interfere with the most efficient exploitation of the coal resources, and that, instead of any partial alterations of the law and of individual rights, dealing with the difficulties in detail, it would be simpler and more effective for the minerals to be acquired by the State once and for all.

This view is expressed in two paragraphs of the report by the Chairman of the Commission, Mr. Justice Sankey :—

“The Interim Report of the Acquisition and Valuation of Land Committee has pointed out at least fourteen defects arising from the present system of ownership of the seams of coal and proposes to create a new sanctioning authority vested with power to issue compulsory orders from time to time to remedy these defects as and when they are in different cases found to exist.

“I regard as preferable to this expensive piecemeal machinery that the seams of coal should be acquired by the State once and for all in one final settlement, together with all usual or necessary easements and rights incidental thereto, together with power to procure all such easements and rights in the future. If the State only acquires the seams from time to time it means many arbitrations, many intermediate settlements, enhanced delay, and increased cost of administration.”

The report signed by the representatives of the mineowners and others (Mr. (now Sir) Arthur Balfour, Mr. R. W. Cooper, Sir Adam Nimmo, Sir Allan M. Smith and Mr. Evan Williams) took the same view. After setting out the fourteen points with regard to which the Acquisition and Valuation of Land Committee of 1919

considered that reforms were needed, these Commissioners proceeded as follows :—

“ We have carefully considered the evidence submitted to us and have come to the conclusion that the most effective method of dealing with the problem in the national interest would be for the State to acquire the ownership of the coal.”

The miners' representatives and those who acted with them, expressed substantial agreement with the Report of the Chairman.

We concur in the general conclusion that the system of private ownership of this great natural resource is open to grave objection. We have examined the case in its defence, that was ably presented in a reasoned memorandum submitted by the mineral owners ; but we do not find that it is conclusive. We are aware that some of the Commissioners of 1919 have since changed their view, partly on account of the enactment of the Mines (Working Facilities and Support) Act, 1923 ; but we do not regard this measure as dealing with more than minor aspects of the question. We cannot contemplate the continuance of the system of private ownership indefinitely into the future.

Consequences of Private Ownership.

The reasons for our general conclusion are these.

A system which vests the ownership of minerals under the surface in the owner of the surface means that the planning of the mines is influenced continually by surface boundaries and surface rights. But surface boundaries have no relevance at all, and surface rights only a minor relevance to the proper organisation of the industry underground. In almost all the other important coal-producing countries of the world this is recognised. The mineral is not the property of the surface owner ; the State either owns it, or has the right to grant concessions for its working, on such terms as may be thought proper. The United States of America, where the principles of English law largely prevail, is an exception. We print in Appendix No. 24, certain information which is available as to the law in other countries.

Many of the present defects of the industry in this country are largely due to the fact that the mines have had to adapt themselves to surface ownership. It is found that, on the average, each mine has had to obtain leases from no fewer than five mineral owners. Nevertheless, the areas of coal worked from any particular pit have not necessarily been those areas which could most economically be worked from that pit, but those for which the mine-owner has succeeded in obtaining leases. The consequences have been an undue expense in development and a waste of time for the miners in travelling underground to and from their work.* These defects of the past are continuing in the present, and will prejudice the future. There

* An interesting illustration of this is afforded by the maps printed in Appendix No. 41.

is still no proper control over the disposition of the new pits that are continually being sunk, in the normal course of the industry, in many parts of the coalfields. Nor is there any remedy if an owner, refusing for any reason to lease his coal, withholds this national asset from development. A variety of minor points, dealing with the barriers of coal left between properties, systems of drainage, rights of support of the surface, wayleaves and other matters, may also be instanced.

We are, of course, well aware that the Mines (Working Facilities and Support) Act of 1923 has dealt effectively with certain of the minor points that have just been mentioned, and with some others, and that its operation could be carried farther by suitable amendment. We print in Appendix No. 17 a Memorandum on this subject furnished to us by Sir Lewis Coward, K.C., a member of the Railway and Canal Commission. But a policy so limited would not, in our opinion, meet the needs of the case.

We are convinced that any unbiassed inquiry could not fail to lead to the conclusion that the private ownership of the minerals has not been in the best interest of the community, and that it would have been very fortunate for the country if, three and a half centuries ago, when the judges decided that the minerals, other than gold and silver, belonged to the surface-owner, the legislature had reversed that decision, and reserved the coal to the State.

The further consequence follows, that, if the existing system is wrong, it ought to be changed. The present generation should not be deterred by the difficulties that attach to the problem from undertaking to redeem the error of the past.

A second reason for our conclusion is the discontent which is aroused by the system of privately-owned royalties. Among the miners in particular there is resentment at a charge being levied upon the fruits of their labour for the advantage of individuals, in return for which, in their capacity as owners, neither work nor enterprise has usually been given on their part. It is unlikely that there will be lasting peace in the industry so long as this grievance continues without redress.

State Acquisition of the Coal.

There is one aspect of the question which is simple, and with regard to which the course is clear. It relates to coal which at present has no market value, and for which therefore no claim for compensation can arise.

In this class, for instance, is coal the existence of which in workable quantities is unknown. The Kent coalfield was in this category not very many years ago. There may be coalfields in other parts of Great Britain that are still unsuspected. A person who owns land under which there is in fact workable coal, although no one knows that it is there, possesses no extra market value, above the value of his land for agriculture or other purposes, on account of the unsuspected presence of the coal. He loses no existing possession if the State, as an act of policy, legislates to the effect

that all such coal shall vest in public ownership. What he loses is the possibility of a sudden unforeseen enrichment, if it should happen that coal were in fact to be found in the future under his land. We consider that it is in the public interest that legislation of this nature should be passed.

In this category again is coal which is situated below the level of 4,000 ft. (by the Ordnance Datum) ; this is now regarded as unworkable. Both the Royal Commission on Coal Supplies of 1871 and that of 1905 accepted that depth as the workable limit, and excluded from their estimates of the coal resources of the country all deeper levels. The Coal Conservation Committee of 1918 saw no reason to depart from that decision. The Chief Valuer of the Board of Inland Revenue informs us that "in practice it might reasonably be assumed that coal situate at a depth below 4,000 ft. is generally regarded as valueless." It is therefore not taxed.

It cannot be assumed as certain, however, that the engineering science of the future will not find means to work minerals at these greater depths. Many thin seams, at the usual depths, are now in active working which 30 years ago were looked upon as worthless, mechanical methods having now been satisfactorily applied. Already, in the Transvaal, experiments are being made with a view to testing the practicability of deeper mining. The development of systems of ventilation has made little progress for many years, and it is by no means impossible that research may discover such improvements in ventilating methods as would enable these deep levels to be mined, without discomfort to the workers. Should that prove to be the case, it would have been a lack of foresight if, in assuming the ownership of coal which now has no market value, the State had omitted this category from consideration. We recommend that it should be included.

The Royal Commission of 1905 reported that the quantity of coal, in the proved coalfields, lying at a greater depth than 4,000 ft., was estimated to be 5,239,000,000 tons.

With respect to other coal, we recommend that the principle of State purchase should be applied.

We have exhaustively examined several policies which might be proposed as partial alternatives. Some of these distinguish in various ways between coal which is already being worked and coal which has yet to be developed. Some would apply the principle of a time limit, and would terminate the system of private ownership at the end of a specified period. Some would do this without providing compensation for the small depreciation in present value that would thus be caused ; others would establish an annuity scheme, that would replace the value of the property at the end of the period ; or else would propose to remit the Mineral Rights Duty, and so give the owners the means to do this for themselves. On balance, we are of opinion that a simple scheme of purchase, of both the developed and the undeveloped coal, is to be preferred.

On two points, however, it is essential that the public interest should be safeguarded.

(1) We could not recommend a scheme which required the State to purchase all the coal in the country indiscriminately. If a number of the existing mines will be obliged by economic conditions to cease working, it would have been unwise for the State to have bought the mineral rights in those cases. A proportion of the mines will in any event be worked out in a few years. Some part of the coal not yet developed it may be found inadvisable to buy. The purchase by the State of the whole of the coalfields, the price paid being on the basis of the present income derived from them and the possible future income, would involve buying a property, parts of which may soon cease to yield their present revenue, and other parts may never yield their prospective revenue. Before any long interval had elapsed, it might be proved by experience that the purchase had been an improvident one. The authority which will represent the State should therefore have the option—to be exercised within a period that would be specified—of deciding whether any particular area or property should be excluded from the purchase or not.

(2) There is a possibility that the value set upon the properties may be higher than is required in equity.

It would not, of course, be possible to value the royalties as though they were a uniform property, by some simple rule, and to pay each owner accordingly. It would not be possible, for example, to take the present income from royalties of a particular owner, based upon a three years' average of his receipts, multiply it by a fixed number of years' purchase, and accept the total sum as the capital value for which compensation should be paid. The conditions vary from one case to another far too greatly to permit such a method. It is now found to be necessary for the purposes of taxation, and would be so found in any scheme of purchase, to make a careful investigation into every particular property, especially with a view to ascertaining how long the property, which is always a wasting asset, is likely to last, and the income to continue. It is necessary to estimate also, so far as it is possible to do so, whether the working of the mineral is likely to pass into seams of greater or of less value; and also to take into account a number of minor points, some of them relating to the terms of the actual leases under which the minerals are being worked.

We recommend that the principles to be followed should be clearly laid down by statute, and should be such as not to permit a higher value to be placed upon the properties for purchase than would be placed upon them for taxation.

The Financial Transaction Involved.

In estimating the extent of the financial transaction that would be involved by a purchase of the coal, we have had the advantage of the advice of Mr. Howell Thomas, the Chief Valuer

in the Valuation Department of the Board of Inland Revenue. Basing himself upon the principle of value in the open market, which is also followed by that Department in assessing mineral properties for Death Duties, and including—a small item—the minerals, such as fireclay, which are actually worked with the coal, the Chief Valuer has furnished us with an estimate, of which the following is the conclusion. (A fuller statement is published in Appendix No. 39.)

“ The present yield of royalties and underground wayleaves is about six million pounds per annum.

“ It is estimated that the probable purchase price to be paid for royalties and underground wayleaves and the minerals neither in lease nor being worked by the proprietor, together with the ancillary rights, is the sum of ninety-two million pounds (£92,000,000).

“ It would, however, be prudent to add to this estimate an amount to cover contingencies. I am of opinion that a total estimated cost to include contingencies of one hundred million pounds (£100,000,000) is reasonable.”

If certain areas were excluded from the purchase this amount would be proportionately diminished; but it is obviously impossible to present any forecast as to the extent to which this consideration would apply. Accepting, then, the estimate of a probable maximum of £100,000,000, we have spent much time in examining what may be expected to be the financial result of the transaction to the State. Account must be taken, not only of the interest and sinking fund on the loan that would be necessary, but of several additional items. The Exchequer would no longer receive the Mineral Rights Duty, the yield of which is now £240,000. It would also lose the income-tax and super-tax upon the difference between the £6,000,000 now received by the mineral owners, and the less sum they would receive as interest on the Government securities, because the latter, being more permanent and stable, would be calculated so as to yield a lower return. The Exchequer would also have to pay the charges now devolving upon mineral owners in Scotland in respect of local rates; these amount to about £230,000 a year. (Mr. Howell Thomas's estimate of the total sum payable by the State, has of course taken into account the present liability of royalties to this charge, and to Mineral Rights Duty.) In addition, the Exchequer would be called upon to defray the cost of management and collection, and the costs arising out of the acquisition. After considering all these in some detail, together with certain other more technical points, we have reached the conclusion that, on the assumptions that the present output of coal remains constant, and that excessive valuations do not raise the purchase value of all the coal above £100,000,000, the transaction would probably leave the annual budget of the State but little affected. There might be a profit of a comparatively small sum, or there might be a small loss, but the factor is not one of large importance.

Effects of State Ownership.

The advantages of State ownership will be greatest in relation to the coal that is to be worked in the future.

The lay-out of the present mines is, in the main, decided. It cannot be radically changed. The State may sometimes be able to exercise a useful influence as mineral owners now do on occasion during the currency of the leases ; and still more when leases fall in for renewal ; but otherwise its power of action will be limited.

It must be borne in mind that all the developed coal, where not in the ownership of the persons working it, is now, of course, subject to leases. A return* which we have obtained shows that 60 per cent. of the present output comes from mines, the principal leases of which will not expire until after the year 1950 ; a further 17 per cent. from mines where the leases will expire between 1940 and 1950. State ownership of the mineral would not bring about immediate and complete State control unless all the leases were declared by statute to be at an end, or, where the coal was worked by the mineral owner, his right to work it to be at an end ; and unless the State then proceeded to deal with the whole matter afresh, as from a new beginning. The effect of such a course upon the conduct of the industry meanwhile could not fail to be disastrous, and we do not know that anyone has suggested it as a practicable measure. Our proposals do not contemplate any interference with existing leases, except in the special cases, and by the special procedure for amalgamations described on page 62.

But leases sooner or later terminate and have to be renewed ; mines sooner or later are worked out and new ones are sunk. The State would then be able to exercise an influence in the one case, a complete control in the other, which, applied by the State as owner and lessor, would be far more effective than any control established through legislative or administrative action.

When we turn to the coal which is not yet leased for working, or being worked by its owners—and this is the coal which will be the field for all the mines of the future—the position is different. Here the way is open. We are not bound in any degree by the errors of the past. Proper planning is essential ; it is as necessary for a new mining area as for a new quarter of a town. If this were to be attempted by the exercise only of a superior control by some public authority, there would almost inevitably arise a constant conflict of view between that authority and the mineral owners. The colliery proprietor proposing to sink a new mine would have to deal with both. To avoid friction, delay and discouragement would be well-nigh impossible. We are convinced that, so far as the unworked coal is concerned, in an even greater degree than with the worked coal, the establishment of a single control, and that in the hands of the State, is needed without delay.

* Appendix No. 18 (Table 18).

Consequential Proposals.

A number of points, consequential upon these proposals remain to be considered :—

(1) It will be necessary to establish an authority which will act on behalf of the State in acquiring and administering the valuable property which will come into national ownership. We propose that a body, to be entitled the Coal Commissioners, should be appointed, in whom would be vested the ownership and the administration of this property. The Coal Commissioners would be nominated by the Secretary for Mines and responsible to him.

(2) We do not contemplate that the Commissioners should intervene in any way in the working of the mines, except so far as may be necessary to assure themselves that the conditions in any lease granted by them are not being infringed ; nor that they should take any part in the settlement of labour disputes. To impose upon them that task would probably impair their effectiveness in the performance of their essential duties.

Questions will arise, with reference to other matters as to the respective parts to be assigned to the Mines Department itself and to the Coal Commissioners. The latter, as we have said, should be responsible to the Department. These are questions of governmental organisation into which we have not been able closely to examine, and on which we do not desire, therefore, to express an opinion. Similarly, the question whether any powers should be specifically vested in the Commissioners by statute, and not left to be delegated by the Secretary for Mines, will no doubt receive consideration in due course.

(3) In the minority of cases where the Coal Commissioners refrain from purchasing particular properties, it should be enacted that, if an owner at any future time desired to dispose of his royalties, he should first be under the obligation to give to the Coal Commissioners an option to review their original decision.

(4) Since, with the exception of those cases, there will in future be only one lessor for new mines, namely, the State, the question of the proper scale and system on which royalties should be charged will need careful consideration. The market value would be determined, as now, by the sums which lessees would be willing to pay. Further, the interest, as consumers, of the whole population, as well as the interest of the mine-owners and miners themselves, would be to keep the scale at a moderate level, so as to facilitate, *pro tanto*, a lower price of coal. We do not think, therefore, that there is a probability that the industry would be burdened by unduly high royalties.

(5) In granting leases for any new collieries it should be one of the principal duties of the Coal Commissioners to ensure that adequate provision will be made for the housing of the workers, and for pit-head baths.

(C8092)

(6) In a later chapter dealing with welfare, we propose a charge of 5 per cent. on royalties as a contribution towards the cost of providing pit-head baths. This contribution, after acquisition of the minerals by the State, will be paid by the State. The fact that it has to be paid will be taken into account in determining the market value of the minerals and will thus reduce the sums received by the present owners.

The State would neither gain nor lose by this, since it would purchase the royalties at a lessened price on the one hand and would make an equivalent contribution to the Welfare Fund on the other.

(7) A simple and expeditious process should be provided for dealing with the severance of surface rights ; with the acquisition of necessary land, of rights of access and of rights to let down the surface ; with the assessment of compensation, and other ancillary matters.

Special provisions will be needed where the mine-owner is also the mineral owner. We are informed by the Mining Association that, of the total acreage of coal now owned or held under lease by colliery undertakings, 12 per cent. is in the ownership of the undertakings.

(8) With respect to coal below the level of 4,000 ft. it will be desirable to provide for the user, on equitable terms, of any surface or other rights that might be needed for the working of such coal by the lessees of the Coal Commissioners, who would in almost all cases be the workers of the over-lying seams. The matters could be dealt with in each case under the Working Facilities Act, but it would be better to make provision by general legislation.

(9) It would be one of the duties of the Commissioners to seek for coal and to prove new coalfields. A proposal on similar lines has already been the subject of a recommendation by the Geological Sub-Committee of the Coal Conservation Committee of 1918. Whatever legal powers might be needed to facilitate the fulfilment of this duty should be conferred.

It would be open to the Commissioners to consider whether they should enlist private enterprise in the work.

(10) We consider that all coal which is already Crown property should be transferred to the administration of the Coal Commissioners.

(11) We would make it clear that, in proposing to sink a new mine wherever coal is referred to, it is to avoid friction, delay and minerals, fireclay or other, which are high impossible. We are con- with the coal.

One small point remains. If worked coal is concerned, in an even upon these proposals. If the worked coal, the establishment that in the hands of the State, is needed charge for underground or detriment suffice

CHAPTER VIII.—DISTRIBUTION.

The distributive agencies connected with coal fall into four sections, namely: the retail coal merchants, the factors and wholesale coal merchants, the exporters, and the selling agencies connected with particular collieries, or groups of collieries. Each of the first three groups, through representative associations, presented memoranda and gave oral evidence to us. This was followed in each case by an investigation of profits and expenses, made by our Accountant Assessor, Mr. A. E. Cutforth (of the firm of Messrs. Deloitte, Plender, Griffiths & Co.), who was given access, with a few unimportant exceptions, to all the balance-sheets and other documents which he required for the purposes of the investigation. These three reports, with a fourth report directly comparing the working costs of coal merchants and co-operative societies, are printed in Appendix No. 37. Mr. Cutforth also made an investigation on our behalf into an important selling agency connected with a group of collieries, but as this relates to a single concern we cannot (under our agreement not to publish figures relating to individual undertakings except where this is desired by the firm) publish his full report. In addition to an examination of the traders' accounts, Mr. Cutforth was furnished, by the courtesy of the Inland Revenue authorities, with valuable general information as to turnover and profits in each of the three groups upon which his reports are published.

Earlier investigations have been made as to the price of coal to various classes of consumers, in particular by the Advisory Committee for Coal and the Coal Industry in 1922, and by conference and correspondence in 1924 between the then Secretary for Mines and representatives of the Coal Merchants' Federation of Great Britain and the Co-operative Societies. As the results of these inquiries have been published, we do not deal in detail with them here.

Expenses and Profits of Retail Coal Merchants.

The retail merchant buys either directly from collieries or through factors. He sells either directly to a domestic consumer, or to a small retailer, or to an industrial undertaking—usually a small one. The larger undertakings buy either themselves, or through factors, that is to say to facilitate, *pro tanto*, a sale. The total number of retail coal therefore, that there is a price very great, probably not less than burdened by unduly high royalties, though they have formed a

(5) In granting leases for any new protection of their general of the principal duties of the Coal Com. The representatives adequate provision will be made for the new denied the allegation and for pit-head baths.

that there was anything in the nature of a coal merchants' "ring."

"When merchants meet on any exchange they cannot fail to know the trend of their market, and as each must seek to obtain his cost and a margin of profit, it follows that prices move in sympathy."†

* * * * *

"Consumers cannot have, or indeed desire, any stouter safeguard than the freest of competition at all stages of the production and distribution of the commodity they require. This they have.

"There is no 'ring,' and in addition to the competition between coal producers and distributors there is that of gas, and electricity, and oil, as alternative means of heating.

"The trade is entirely unsheltered and there is nothing to prevent anybody becoming a coal merchant, nothing to restrict his purchasing market, and nothing to prevent him selling at any price he thinks fit."§

The time at our disposal did not permit of any exhaustive inquiry as to the degree to which the principal coal merchants in the same town are accustomed to consult as to the prices which they propose to charge. No serious evidence, however, was brought before us to impugn the substantial correctness of the contention embodied in the passage set out above.

The investigation made by Mr. Cutforth dealt with the businesses of six merchants doing between them probably not less than 25 per cent. of the retail coal trade in London. It covered for those businesses their last two financial years completed before the war, and four financial years since the war, ended at different dates in 1922, 1923, 1924 and 1925. The following table summarises the results:—

Table 7.
Expenses and Profits of Six Retail Coal Merchants in London.

	<i>Mean of Two</i>		<i>Mean of Four</i>	
	<i>Pre-war Years.</i>		<i>Post-war Years.</i>	
	<i>(Per Ton.)</i>		<i>(Per Ton.)</i>	
	<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>
Sale Price	23	0	47	3
Cost at Depôt	18	5½	36	5
Gross Profit	4	6½	10	10
Expenses	4	5¼	9	10½
Net Profit	0	1¼	0	11½

The profits are arrived at before charging remuneration of partners, directors and managing directors, or interest and taxation; they do not include any profits on the merchants' running of their own wagons.

† Rickett, para. 22.

§ Rickett, para. 47.

The expenses and profits in each of the pre-war years were much the same and averaged 4s. 5½d. per ton for expenses, and 1½d. per ton for profits. The average sale price was 23s. so that the profit was ⅙ per cent. on the turnover. In the four post-war years the expenses averaged 9s. 10½d. per ton, the profits 11½d. per ton, or a little over 2 per cent. on the turnover, with an average sale price per ton of about 47s. 3d.

These figures as they stand show that, while the cost at the depôt has not quite doubled, the gross profit has a good deal more than doubled, and that the net profits are many times greater. It seems certain, however, that the very small pre-war profit of 1½d. per ton cannot be regarded as typical. The information obtained by Mr. Cutforth from the Inland Revenue Department comparing two post-war years with the pre-war year 1912-13 shows, both for limited companies and for individuals and firms, a rate of net profit in relation to turnover lower since the war than before it: that is to say, though the profit in pence per ton has increased, it has not increased in the same proportion as the selling price. The Inland Revenue statistics refer to the whole country while the others refer to London only. It is clear that the London coal merchants' figures of net profit for the years before the war cannot in fairness to themselves be taken as typical.

On the other hand, the increase in the total margin required by the retail merchants and in their expenses is disquieting. Evidence as to corresponding margins and expenses was laid before us by Mr. A. V. Alexander, M.P., on behalf of the retail co-operative societies, and this evidence was followed by inquiries under the charge of Mr. Cutforth. The comparative results of ordinary and co-operative retail trading are summarised in the following table, in which some of the figures differ, through minor corrections and adjustments, from those presented in Mr. Alexander's evidence:—

Table 8.
Expenses and Profits of Retail Coal Trading.
(Financial Year ended in 1925.)

	<i>Six London Merchants.</i>		<i>Co-operative Society.</i>	
	<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>
Cost at Depôt		35 3		33 1½
Expenses:—				
Cartage	5	7½		7 11½
Establishment and Clerical	3	6½		1 10½
Salaries	1	0½		1 7
Other				
Total		10 2		11 5
Net Profit		0 6½		0 11½
Selling Price		45 11½		45 5½

The price of coal as delivered to the depôt (including railway freight and wagon hire) is about 2s. more for the merchants than for the Co-operative Society. This may be fully explained by difference in the quality of the coal.

The expenses of the Co-operative Society taken together are 1s. 3d. per ton more than those of the merchants. The nature of these expenses differs, however, greatly in the two cases. The expenses of the Co-operative Society for cartage are 7s. 11½d. per ton as compared with 5s. 7½d. for the merchants. The Co-operative Society deals almost wholly with domestic consumers and, in general, with smaller domestic consumers than the merchants do; it has also a larger proportion of trolley work, for which wages and other expenses are higher. A certain proportion, moreover, of the merchants' sales consists of sales, not to domestic consumers at all, but either to small retailers or to industrial concerns. The proportion supplied to small retailers, on which, therefore, a further profit and expenses would fall, is probably about 7 per cent. of the whole; as to the proportion going to industrial undertakings we have no information.

The charges for establishment and for clerical salaries of the merchants are 3s. 6¼d. as compared with 1s. 10½d. for the Co-operative Society: a difference of more than 1s. 7d. a ton in favour of the latter. This establishment charge of 3s. 6¼d. represents, on all the coal dealt with by the merchants, a very large sum. If Mr. Errington Brewis' estimate* to the Commission of 1919 as to the amount of coal being delivered by merchants in London is accepted, and allowance is made for a moderate increase since then, the amount now being spent by the merchants on establishment and clerical salaries must be put at not less than £1,000,000 a year. This excludes not only cartage, sacks, siding and wharf rents, and loss on small coal and by short weight, but also the remuneration of directors, managing directors and partners, which is included in profits. The actual expenditure is presumably more than this £1,000,000 since the figure of 3s. 6¼d., represents the experience of merchants with a larger turnover, whose costs per ton should be relatively low. These charges in the case of the merchants include expenditure on travellers, advertising and branch offices, which is relatively small with the Co-operative Society.

On items other than cartage, establishment and salaries, the expenditure of the Co-operative Society is the heavier—1s. 7d. against 1s. 0¼d. The difference is due almost equally to greater loss on small coal and short weight, and to heavier siding and wharf rents and demurrage.

Finally, the Co-operative Society shows a profit of 11½d. per ton, the bulk of which is returned to customers, and is thus equivalent to a reduction of prices, as against the profit of 6½d. retained by the retail merchants.

The general result of this comparison is to suggest that the expenditure of the retail merchants on establishment and clerical

* Commission of 1919; Brewis, Q. 9583.

salaries is excessive; if all the retail trade in London could in these respects be conducted as economically as that of the Co-operative Society whose accounts have been examined, a very substantial margin would be available, either for reducing prices to the consumer or for increasing prices to the colliery, and so increasing wages to the miner.

Expenses and Profits of Factors and Wholesale Coal Merchants.

The function of the coal factor, as it was stated to us by Mr. George Rose, is to purchase large tonnages from various collieries and to distribute the coal to small merchants and consumers throughout the country. "In a broad way of speaking, a coal factor is a man who distributes coal wholesale in truck-load or barge-load or ship-load, while a coal merchant, generally speaking, delivers his coal by van."* The factor is sometimes regarded as a mere speculator, needlessly intervening and inserting an unnecessary margin of profits and expenses between the producers and the ultimate consumers of coal. Sometimes he may be that; there may be room for reducing the number of cases in which a factor intervenes. The substantial value of the service of "factoring," in some cases at least, is sufficiently proved both by the practice of some of the largest consumers of all—such as the London Gas Companies—in buying nearly all their supplies through a factor rather than direct, and by the practice of the Co-operative Wholesale Society, who can hardly be accused of speculation, but who themselves do a large factoring business for retail societies.

It is thus possible, in this case also, to compare the results of ordinary and of co-operative trading, as well as to make a comparison for the former between pre-war and post-war experience. This is done briefly in the following table, based as to the wholesale merchants on Mr. Cutforth's investigation of their accounts, and as to the Co-operative Wholesale Society on the evidence of their witnesses:—

Table 9.

Expenses and Profits of Coal Factors.

	<i>Six Wholesale Merchants.</i>		<i>Co-operative Wholesale Society.</i>	
	<i>Mean of Two Pre-war Years.</i>	<i>Mean of Three Post-war Years.</i>	<i>1924.</i>	<i>1925 (6 months).</i>
	<i>s. d.</i>	<i>s. d.</i>	<i>d.</i>	<i>d.</i>
Gross Profit per ton ..	7·0	13·8	7·6	6·8
Expenses per ton ..	3·0	7·8	4·6	4·5
Net Profit per ton ..	4·0	6·0	3·0	2·3
Average Sale Price ..	13 11½	26 0	—	—
Average yearly tonnage	3,403,000	3,314,000	1,109,000	1,121,000

* Rose, Q. 7246.

Looking first at the wholesale merchants alone, it will be seen that their sale price and their gross profit have risen at about the same rate, each being nearly double what it was before the war. The gross profit includes expenses, which have more than doubled, and profits which have risen only 50 per cent.; the expenses accordingly are greater, and the net profit smaller, than before the war in relation to turnover. The division between the two items, however, is not an exact one, as the remuneration of directors, managing directors and partners is reckoned with profits.

The last two columns of the table show for the Co-operative Wholesale Society since the war materially lower figures throughout. The gross profits are barely half, the expenses less than two-thirds, and the net profits less than half of those recorded for private traders. The Co-operative Wholesale Society buys occasionally from other factors and not from the collieries direct, but it is not clear that it does so more often than an ordinary factor would; so far as can be seen, the service in distribution rendered by it is substantially the same as that of the ordinary factors. Its lower costs are partly due to differences of practice; it gives as a rule shorter credit and so incurs less bad debts, and, dealing with an assured *clientèle*, it has practically no need of travellers. Bad debts and travellers, however, account for not more than 1½d. of the merchants' costs. Another cause of the difference is probably to be found in the scale of the Society's business, which, as will be seen, is nearly twice the average of the six merchants—about 1,000,000 tons a year against 500,000. A factor in a large way of business can and does usually take a lower rate of gross profit in relation to his tonnage; the thirteen factors whose accounts were examined for the year ended 30th June, 1925, had an average expense of 8d. per ton, but we were informed by Mr Cutforth that the rate for particular firms among them was as low as 3½d. or 4½d. per ton.

Expenses and Profits of Coal Exporters.

Analysis of the accounts of coal exporters is a little more difficult than with the other classes of distributors, because of the yet greater degree of inter-locking with other kinds of business. Of the ten firms examined by Mr. Cutforth the majority were interested also in businesses other than exporting coal; their activities included coast-wise coal business, inland sale, lumbering, timber and brick departments, shipbroking and clearances, commission and brokerage, and sales agency business for collieries. Allocation of expenses and profits to coal exporting proper is therefore to a considerable extent a matter of estimate, and the figures cited below must be taken subject to that caution. Full facilities for investigation, however, were afforded to Mr. Cutforth and there is no reason to suppose that the broad

results are open to serious question. They are set out in a summary form in the following table:—

Table 10.
Expenses and Profits of Nine Coal Exporters.

	<i>Mean of Two Pre-war Years, 1912-14.</i>	<i>Mean of Three Post-war Years, 1922-25.</i>	<i>Mean of Two Post-war Years, 1922-24.</i>
	<i>d.</i>	<i>d.</i>	<i>d.</i>
Gross profit per ton ..	5·5	8·8	11·6
Expenses per ton ..	2·0	4·1	4·4
Net Profit per ton ..	3·5	4·7	7·2

The quantity handled by the nine exporters was before the war nearly 9,000,000 tons, and after the war about 10,500,000 tons a year. The percentage of profit to turnover in respect of seven firms whose pre-war turnover could be given was about 2 per cent. both before the war and after.

It will be seen that the rate of increase on pre-war conditions in respect of all three items in the table is, on the whole, less for the exporters than for the other classes of traders considered, but here also the expenses have increased more rapidly than the profits.

In this connection it has to be remembered that the years just before the war witnessed a very rapid development of the coal industry, and that this was most marked in the export trade, so that the profits then were probably unusually high. The three financial years after the war include one of exceptionally good exports, due to the occupation of the Ruhr, and one—ending in 1925—of depression. In this year the nine exporters as a whole made a loss; if this year be excluded, and two prosperous post-war years are taken for comparison with two prosperous pre-war years, the result is as appears from the last column of the table. Each item has rather more than doubled.

The investigation brought out clearly the uncertainty of the export trade, and the risks involved. As is pointed out by Mr. Cutforth, only two firms out of the ten which were examined made a profit in all the periods under review. "The firm which at any time had the largest rate of profit per ton (in 1923—occasioned by the Ruhr position) experienced a loss in one of the pre-war years. Another firm which had a profit in both of the pre-war years sustained losses in each of the post-war periods."

Colliery Selling Agencies.

Collieries normally sell their coal direct, to a consumer, a factor, a merchant, or a shipper, employing salaried salesmen, or, as they are called in certain districts, "fitters." In some cases, however, a formally separate but associated agency is established,

to dispose of the output whether of a single colliery or of a group of collieries. As against 170,000,000 tons shown in our returns as sold independently in 1924, just over 20,000,000 tons was disposed of to coal selling-agencies in which the colliery undertaking, or some of its directors, or persons engaged in its management, had a substantial financial interest. Such selling agencies are commonest in South Yorkshire, where the coal disposed of through them is more than a third of that sold independently, and in South Wales. Of the anthracite, more passes through associated selling agencies than is sold independently, while for other coal in South Wales, the proportion is more than a quarter. As a rule the work is done on a commission basis—6d. per ton to the agency being a common figure—though considerably more is charged in some cases.

We obtained through Mr. Cutforth a report on one of the most important of these agencies—the Doncaster Collieries Association. This is constituted as a limited company in which the great majority of the shares are held by four allied colliery undertakings in the South Yorkshire coalfield. Besides disposing of their whole output at a commission of 6d. per ton, it performs other services, such as the buying of materials, the co-ordination of electric power, and the supply of technical experts, to which reference has been made in the chapter dealing with the Structure of the Industry. The profits, which are substantial, go back as dividends to the constituent colliery undertakings; they are not treated there as proceeds for the purpose of the wage ascertainment.

The working of this and similar agencies raises an important and difficult problem. The co-operative organisation of selling, buying, power, transport and technical skill, as seen in the Doncaster Collieries Association, is, beyond question, a material improvement in efficiency and economy. It is an example which we should like to see widely followed; nothing should be done to discourage the spread of similar co-operation elsewhere. On the other hand, an associated selling agency may appear to the miners to be a means of taking out of the wage ascertainment part of the proper proceeds; if a colliery replaces its own salaried salesman by an independent but associated selling agency which charges and makes a large profit on a commission of 6d. a ton, the district ascertainment will be the poorer by that profit.

Organisation of Distribution.

The information collected by us as to costs of distribution and summarised above, though less complete than we should have desired to make it, is sufficient to show that there do exist between producer and consumer substantial margins of profit or expenses, which might be narrowed to the advantage of one or other or both of them. It ought to be possible, either to reduce the price of

coal to the consumer, or to raise it to the colliery. In this our evidence only confirms findings upon which all parties in the Commission of 1919 were substantially agreed. According to the final report signed by Mr. (now Sir) Arthur Balfour, Mr. R. W. Cooper, Sir Adam Nimmo, Sir Allan Smith, and Mr. Evan Williams, "the evidence shows that considerable saving is possible in the distribution of household coal." They looked forward to an extension of trading by co-operative societies and they recommended that wherever consolidation of the present distributing agencies was possible it should be effected, provided that it did not lead to trusts or combinations to the detriment of the consumer.

The practical measures that will secure this end of narrowing the distributor's margins, without exposing the consumer to exploitation by monopolies, are not easy to suggest.

In respect of retail distribution it was proposed to us by Mr. Shinwell, the former Secretary for Mines, that power should be given to municipalities to engage in the trade, in competition with the private merchants. This plan, subject to the proviso that no charge should be allowed to fall on the rates, had in fact been approved by most of the members of the Commission of 1919. Mr. H. C. Rickett, in his evidence before us, raised no objection to the plan, while stressing the proviso as to rates; he thought that the retail merchants would have no difficulty in holding their own.

This proposal might have useful results in the directions that are desirable, and we recommend that legislation should be passed to give effect to it.

It will not be practicable to apply a definite prohibition of recourse to the rates; for if a local authority did in fact incur losses in any particular year, it would be obliged to pay its debts, and it would, as a rule, have no means of doing so except from the rate fund. The control of the ratepayers would usually be sufficient to prevent the continuance of unsuccessful trading, but it might be advisable to provide in addition for intervention by the Ministry of Health, or of the Scottish Board of Health, as the case might be, in necessary cases.

While we recommend that this proposal, on which there is general agreement, should receive legislative sanction and that municipal authorities should be empowered to engage in retail trade, we cannot feel certain that it will, by itself, effect all the objects in view. This, however, can be tested by experience. We think that after a period of two years the position should be reviewed by the Mines Department, with a view to determining what reduction of expenses had been possible, and what further measures, if any, were required.

For the rest, we are strongly of opinion that the collieries would be well advised to establish Co-operative Selling Associations. The creation in the future of the larger undertakings which we envisage should make this easier.

The associations are not likely to become so comprehensive as to stop any competition within the industry, and so to prejudice the interests of the consumer by establishing a monopoly. But the present system of selling appears to carry competition to excess.

The industry has already successfully established Mutual Indemnity Associations to deal with Workmen's Compensation cases, and so has eliminated, to its own advantage, the profits that would otherwise have been paid to Insurance Companies. The principle might be carried further. The profits of those associations should be treated as colliery proceeds for the purpose of the wage ascertainment.

Selling Associations of this nature would play a useful part in organising the pools of railway wagons, of which mention is made in the chapter of this Report that deals with Conveyance, and on which reliance must be placed for reducing the waste now caused by the excessive shunting of mineral wagons.

In the exporting districts, the Associations are especially needed. Their function would be to maintain prices at a remunerative level in those foreign markets where the competition is not so much between British and foreign exporters, as among the British exporters themselves.

If the industry succeeded in creating organisations for this purpose, it is possible that it could secure the co-operation of the existing German Kartell in an arrangement to prevent the prices of coal in neutral markets from again falling to unremunerative levels.

Preparation of Coal and Sale on Analysis.

Two further points, closely connected with each other, remain for consideration.

The preparation of coal for the market is becoming of increasing importance. The higher price of coal now ruling makes the purchaser more particular as to the quality supplied, and this is especially the case with overseas buyers. Connected with this is the question of buying coal under a guarantee as to quality, or at a price depending on some ascertainable characteristic, such as ash content or calorific value. Increased attention to these points is being paid in continental coalfields, and this undoubtedly in some cases gives them an advantage over British coals, even though their coal intrinsically is of lower value.

A uniform quality may be important to the consumer, and he may prefer a coal on the characteristics of which he can depend to a coal of possibly higher, but varying quality.

The methods to be adopted in grading and cleaning coal must necessarily depend upon the circumstances of each pit, and the purpose for which the coal is to be used. We consider that increased attention should be paid to these points by the industry, and that the study of methods of cleaning, grading, sizing, and

blending coal is one of the most important of the duties which should be undertaken by the organisations for research to which we refer in a preceding chapter.

More careful preparation makes possible the sale of coal to a specification, and this should have a beneficial effect upon the export trade, and, indeed, upon the coal trade generally, assuming that the specifications are reasonable, and confined to essential points. Any rigid specification of non-essentials cannot be beneficial, and may be harmful.

We feel that it would be of considerable benefit in many cases if the producers and dealers in coal were to state the broad specifications for the coal which they were prepared to supply. Were this practice generally adopted it would ultimately lead to the special value of individual seams for particular purposes being adequately realised.

Where coal of a certain quality is specified, however, and the coal is sold under a guarantee, disputes as to the quality actually supplied are likely to arise, and have arisen in the past, particularly with foreign buyers. It is by no means easy to obtain a fair sample of a large consignment of coal, such as a cargo, and no independent authority for taking such samples exists in this country.

If it were possible to establish a public authority which should perform the duty of sampling, to be followed by analysis of cargoes of coal at the ports (a suitable plant for the purpose being provided at each port), and if that authority were approved by foreign buyers, and its operations conducted by methods internationally agreed, considerable advantages would ensue. Many disputes would be avoided. The double sampling and analysis which is now frequent, first on behalf of the seller in this country and then of the buyer abroad, would be eliminated. We suggest for consideration that inquiries should be made on this point in the principal countries which import British coals, and that, if the plan should be approved in principle, a Technical Conference should be summoned, of an international character, to put it into definite form. The initiative might properly be held to devolve upon Great Britain, as the principal coal producing country in Europe.

CHAPTER IX.—CONVEYANCE OF COAL.

Railway Rates.

In the case of a commodity bulky and heavy in proportion to its value, such as coal, the cost of transport must necessarily be a large element in the price. When, for example, coal is transported by rail from the Midlands to London, the cost of the carriage adds on the average between 40 and 50 per cent. to the pithead value.

The railway rates now in force for the carriage of coal show an increase over pre-war rates of 50 per cent., plus a flat rate addition of 2d. per ton, with a maximum increase of 2s. per ton for blast furnace fuel and 3s. 6d. per ton for other fuel. On the average these rates represented in 1924 an increase of 54 per cent. over the rates in operation in 1913.* The total receipts of the railway companies from coal traffic were £22,672,036 in 1913 and £37,773,394 in 1924; an increase of 67 per cent. The receipts per ton have increased from 2s. in 1913 to 3s. 7d. in 1924; an increase of about 80 per cent.† The increase in the receipts from the coal traffic is therefore considerably greater than the increase in the rates charged. The explanation appears mainly to be that a larger quantity of coal is carried the longer distances, especially to London, and a smaller quantity is carried the shorter distances, especially to the ports and to the centres of the iron and steel trade. This explanation was challenged by the Mining Association when Sir Ralph Wedgwood was under examination. In view of the facts submitted, it is difficult to see what other explanation is possible.

In the evidence given before us on behalf of the railway companies, it was stated that the increase in railway rates over 1913 is due entirely to the increased cost of labour and materials. Labour costs are stated to have risen from £47,000,000 in 1913 to £120,000,000 in 1924, an increase of 153 per cent.‡

The expenditure of the railways themselves upon coal has increased between those years by 89 per cent.§ Railway expenditure generally increased in the same period by 120 per cent. In 1913 the cost of coal consumed by the railways represented nearly 11½ per cent. of their total expenditure, while in 1924 it represented just over 9½ per cent.§

The bulk of coal traffic is carried at rates below the statutory limits, and traffic for shipment is carried more cheaply than inland traffic. It should be remembered, however, that, traffic for

* Wedgwood, para. 4.
‡ Wedgwood, para. 21.

† Wedgwood, para. 10.
§ Wedgwood, Q. 14433-9.

shipment moves generally in larger bulk than inland traffic, and in complete trainloads from the colliery districts to the ports.*

Causes of High Cost of Railway Transport.

The cost of the railway transport of coal is kept at a high figure by four factors :—

- (1) The rate of railway wages and the conditions of work of railway employees.
- (2) The small size of the trucks usually employed.
- (3) The requirement that all trucks, other than those belonging to the railway companies, should be returned, at the end of their journeys, to the particular colliery or trader to whom they belong.
- (4) The small number of journeys travelled by each truck per month.

(1) It is not within our province to express any opinion whether the rates of wages and conditions of work of railwaymen are open to criticism or not. The matter has lately been dealt with by the Tribunal established for the purpose.

(2) Coal wagons now in use are generally of 8, 10 and 12 ton capacity, and we have been informed that there are as many as 57 types of wagon still in use throughout the country.† There has, however, been an advance recently towards standardisation, so far as running gear is concerned, and only two types are now being built—the 12-ton wagon and the 20-ton wagon.‡ But so far as other features of the wagons are concerned, such as the doors and plating, there is no general standardisation, and a great many different types are still being built to the specifications of the numerous owners. The evidence of the witnesses on behalf of the wagon owners as to the necessity for maintaining this large number of different types was by no means convincing.

Expert opinion tends to the view that the 20-ton wagon would be the right type to be brought into general use. Mr. W. T. Stephenson, Cassel Reader of Transport in the University of London, gave evidence before us as follows :—

“ The advantages of the 20-ton wagon over the 10-ton wagon are that, whilst the increase in capacity is 100 per cent.—

“ (a) The tare weight is only 33 to 50 per cent. more.

“ (b) The length is from 16 to 30 per cent. more.

“ (c) The resistance per ton is reduced, so that a locomotive can haul at least 10 per cent. more gross load, which means the train will carry 25 per cent. more coal.

* Wedgwood, Supplementary Note (at end of his Evidence).

† Cooper, Q. 15130 *et seq.*

‡ Middleton, Q. 15262.

- “(d) There are fewer wagons to couple and uncouple, so that shunting work is reduced.
- “(e) The capital cost per wagon will be only some 50 per cent. more, or a saving of 25 per cent. on the total wagon capital.”*

Mr. Stephenson suggested that the universal adoption of 20-ton wagons would ultimately result in a saving of not less than 20 per cent. of the costs of operation; which should permit a reduction of freights of at least 10 per cent.† Sir Ralph Wedgwood put the possible reduction on freight at between 5 and 10 per cent.‡ Assuming that the average cost of the transport of a ton of coal from the Midland coalfield to London is 10s., it would appear that the universal adoption of 20-ton wagons might allow of the reduction of this rate by an amount approaching 1s. per ton.

There are a number of difficulties that stand in the way of the general adoption of the 20-ton wagon. A considerable proportion of the collieries are not equipped to take them; their screens, weigh-bridges and sidings would require adaptation. This is so in some districts to a greater extent than in others. In the North-Eastern districts and in South Wales, where large capacity wagons have already been adopted to some extent, the process of adaptation has already been carried a considerable way. No information is available for the country as a whole, but we have been informed that 81 per cent. of the Northumberland and Durham collieries, and 52 per cent. of the collieries in Yorkshire, Derbyshire and Nottinghamshire, to which hopped wagons are now sent regularly, are equipped to take 20-ton wagons.§

The ports are also not yet generally equipped for the purpose, and alterations to a number of hoists, tips, etc., would be necessary before 20-ton wagons could come into general use. The expenditure that would be incurred in this respect would be considerable in the total, although the annual charge involved would not be large in proportion to the tonnage handled. The Great Western Railway has spent £2,000,000 during the past two years on improvements at the South Wales Docks, and 20-ton wagons can now be taken at all those ports. We have been informed that it will need another two or three years for the full programme of the company to be completed.||

A far larger capital expenditure would be involved if it were a question of the sudden replacement of all the existing wagons. During the war years, however, the private building of wagons was almost stopped, and, while recently some of the arrears have been made good, it is probable that some four-fifths of the privately-owned wagons now in use are 20 years old or over. Since the average life is usually considered to be rather more

* Stephenson, para 4.

† Stephenson, Q. 11740-2.

‡ Wedgwood, Q. 14103.

§ Wedgwood, footnote to Q. 14404.

|| Ford, Q. 14609 *et seq.*

than 30 years, almost all these should be replaced in the next 10 years.

In this country there is a very detailed distribution of coal by the railway companies to small railway centres and to merchants in a small way of business. Even the 12-ton wagon is often consigned with an incomplete load. This factor has to be taken into account when the universal substitution of the larger wagon is suggested.

It is alleged, again, that the larger wagon involves loss through greater breakage of some classes of coal.

It is also alleged that, being constructed wholly or largely of steel, the larger wagon is more subject to corrosion when washed coal is carried. On this point we have obtained information from the Great Western Railway, who have recently introduced a number of 20-ton wagons constructed wholly or largely of steel. It is their experience that the carriage of washed duff in steel-framed wagons does cause corrosion of the iron work or steel work of the vehicle. But it is considered that a watertight all-steel wagon with a steel floor would protect the underframe more completely. Any corrosion would be confined to the floor; the corrosion could be easily seen and the affected part renewed at small cost. (The memorandum from the Great Western Railway is printed in Appendix No. 36.)

The North Eastern Railway, now a part of the London and North Eastern Railway, adopted a 20-ton wagon some time ago, and this was accepted by the principal dock authorities and consumers on the North East Coast. At the present time, 61 per cent. of the total capacity of the hopper-bottomed wagons used for mineral traffic in Northumberland, Durham and the North Riding of Yorkshire is accounted for by wagons of a capacity of 15 tons and upwards. This railway company did not allow any reduction of rates on the adoption of these wagons. In their view the coal owner or consumer obtains an advantage from the increased capacity of his sidings and from the general modernising of methods of carriage. Sir Ralph Wedgwood in his evidence stated that "the experience of the North Eastern has been that the economies realised from the adoption of the larger wagon are real, but not excessive. At the same time the full realisation of economies of this kind must, in the long run, assist the general level of rates, and in this way the economies have a definite value to the coal owner and coal consumer."*

In 1923 the Great Western Railway, in order to encourage the use of 20-ton wagons in South Wales, announced that they were prepared forthwith to allow a rebate of 5 per cent. off their rates in respect of "coal class" traffic conveyed wholly over their system in fully loaded 20-ton wagons. In addition, early in 1925, they reduced the charge for tipping and weighing coal at their docks from 7½d. to 6d. per ton in respect of coal carried in fully loaded wagons of this type.

* Wedgwood, para. 57.

Number and Ownership of Wagons.

(3) The existing system of ownership of railway wagons is the outcome of the history of the British railways. At first the railways were intended to provide only the track and haulage, and users were expected to provide their own wagons for the transport of merchandise, in the same manner as users of the highway provided carts.

It may be estimated that at present there are about 700,000 coal wagons in Great Britain. Of these about 520,000 are privately-owned; the balance are those wagons belonging to the railway companies that are expressly recorded as being mineral wagons. The capital value of all these wagons is probably between £60,000,000 and £65,000,000. About 31 per cent. of the total tonnage of coal carried in 1924 was carried in railway-owned wagons, and 69 per cent. in privately-owned wagons. These belong to about 10,000 separate owners, who are either mine-owners, factors, merchants, exporters, or wagon-owning companies.

Although the greater part of the coal traffic of Great Britain is carried in privately-owned wagons, the system varies in different districts.

- (a) In the Northumberland and Durham coalfield practically the whole of the traffic handled by the railway company passes in railway-owned wagons, whether intended for shipment, or for industrial or domestic purposes inland. In the North Eastern area of the L. & N.E. Railway, 88 per cent. of the coal and coke traffic originating there is carried in railway-owned wagons.
- (b) In the Kent coalfield the Southern Railway provides the wagons.
- (c) In Scotland approximately 60 per cent. of the traffic is carried in railway-owned wagons and 40 per cent. in privately-owned wagons.
- (d) In the Yorkshire, Lancashire, Nottinghamshire and Derbyshire coalfields, although the bulk of the traffic is carried in privately-owned wagons, the railway companies supply wagons on request.*
- (e) In South Wales the traffic is carried almost exclusively in privately-owned wagons.

It is not usually realised how large a proportion of the capital cost of establishing an important new colliery has to be allocated to the provision of railway wagons. Mr. G. P. Markham has provided us with figures that show that on a capital outlay of from £1,750,000 to £2,000,000 on developing a new colliery, some £300,000 must be set aside for the provision of wagons.†

We have been furnished with various estimates of the savings that could be effected if railway-owned wagons were substituted

* Wedgwood para. 41.

† Appendix No. 31.

for privately-owned wagons, or if some other form of common user were instituted. Sir Ralph Wedgwood, for example, estimated the total shunting time chargeable against private coal wagons to be 9,000,000 engine hours a year, and that if all wagons were railway-owned, about 1,200,000 hours would be saved,* or, taking into consideration certain further savings, about 1d. per ton on the total of rail borne coal and coke traffic.†

(4) With regard to the number of journeys per month that wagons actually make, the general average appears from statistical calculations to be about 2½. We have been informed that on the London, Midland and Scottish Railway the average is barely 2, and Mr. Cockbaine stated in evidence that the Co-operative Wholesale Society had been unable to raise the average for their wagons over 1½.‡

It is true that coal cannot always be brought from the nearest point, owing to the necessity of using particular classes of coal for particular purposes. The National Union of Manufacturers has written to us to express the following opinion :—

“ In no case must the selection of the most suitable coal for our use be interfered with, for in many large works different classes of coal are required for different purposes in order to secure the best results. To meet the varying needs of industry, coal is transported long distances—through other coalfields possibly—and meets the requirements better even with the added cost of longer transport than coal available nearer.”

Nevertheless, the user obtained from the wagons in Great Britain seems to be remarkably low, and to compare very unfavourably with that obtained in France, Belgium and the Ruhr.

Experience Abroad.

In order that we might obtain general information with regard to the conveyance of coal by rail in continental countries, we arranged for Mr. C. E. R. Sherrington, the Secretary of the Railway Information Bureau, who was engaged in an investigation on its behalf in France, and Belgium, to extend his inquiry to Germany also and to furnish us with a report. This report is printed in Appendix No. 23.

It appears that—

- (a) In all three countries the wagons are, generally speaking, railway-owned, and there is a complete common-user.
- (b) In all three countries the standard wagon now used is the 20-ton wagon. There are some wagons of 10 and 15 ton capacity, but these are not now being built and are rapidly disappearing. In the Ruhr, for example, the average wagon load of coal in January 1924 was just over 19 tons.

* Wedgwood, paras. 45–48.

† Wedgwood, para. 51.

‡ Cockbaine, Q. 15686.

- (c) The wagon user, or time taken on a round trip, is 4 to 5 days in France, and $4\frac{1}{2}$ to $5\frac{1}{2}$ days in Belgium. From information subsequently obtained it is estimated that the comparable figure for the Ruhr coalfield of Germany is about 4, and that in all those countries a wagon on the average travels each month from five to six journeys of an average distance longer than that in this country.
- (d) No greater breakage of coal in large capacity wagons, compared with smaller wagons, had been experienced.

Mr. Sherrington points out that there are certain differences in the conditions in those countries from those prevailing here ; for example :—

- (a) Wagons are generally designed to carry other merchandise as well as coal, since coal does not form so large a percentage of the total freight traffic as it does in Great Britain.
- (b) Coal traffic is mainly for consumption on the continent of Europe, and wagons are not therefore primarily designed for rapid discharge of coal into ships.
- (c) The railway lay-out in the mining districts of the three countries is less cramped than is often the case in Great Britain, in that curves are less sharp, and loading gauges are wider and higher.
- (d) As a result of reconstruction, following war damage, the railway lay-out at the mines of the Nord and Pas de Calais coalfields in France is in accordance with most modern practice.

Objections to Previous Proposals.

For meeting these defects in the present system, it has been suggested that all mineral wagons should forthwith be transferred compulsorily either to the railway companies or to a co-operative organisation to be established by the present wagon owners. It has also been proposed that the construction in the future of any wagons smaller than 20 tons should be prohibited.

We recognise that it would have been better on balance if all the mineral wagons had been in the ownership of the railways from the beginning. In existing circumstances we cannot recommend these proposals for adoption, though we shall suggest an alternative later.

The reasons that deter us are these :—

All the parties directly affected are definitely opposed to the wagons being brought into the ownership of the railway companies. The railway companies themselves, the mineowners and the traders all gave evidence in opposition to such a measure. A national pool, formed by the present owners, is also regarded by them as impracticable, and even if an opposite view were held, the proposal could hardly be imposed upon them by compulsion.

It is urged that the present system enables provision to be made for the transport of coal in times of trade activity and seasonal pressure which could not adequately be made otherwise. It is remunerative for the colliery or for the merchant to keep on hand a supply of wagons above the usual need, on account of the large profits he may make from the sale of coal in times of high prices; a railway company or a general wagon-owning corporation would be without this inducement. If there were a shortage of transport at such times, prices would rise to an excessive level and the consumer would suffer.*

The mineowners did not feel convinced that a regular supply of wagons would be maintained adequate to their normal needs. If it fell short, the number of idle days at the collieries would be increased, and what is already a cause of loss both to the owners and to the miners would be made worse.

The collieries are accustomed to using the wagons that they own, when they are not in active employment, for storage. This seems, at first sight, an uneconomical system (and it no doubt accounts in some measure for the small number of journeys per month; although the railway-owned wagons should not be affected in this respect). But it need not necessarily be uneconomical. If a 10-ton wagon is worth on the average £90, as stated by the witnesses on behalf of the wagon owners, and if 10 per cent. be allowed for interest and replacement, the wagon involves a cost per day of 6d. It may often be more economical to bear this cost and to use the wagon for storage than to meet the charge for depositing the coal elsewhere and loading it again, with the accompanying loss from breakage to be added to the cost of labour.*

The old North Eastern Railway did, however, bring pressure to bear upon the mineowners to ensure that the mineral wagons on the greater part of their system should be railway-owned. The conditions there are those of a district producing mainly for export with a very short haul. And we have been informed that about 50 years ago the Midland Railway endeavoured to pursue that policy, and purchased about 67,000 trucks; but that the measure was not successful. The railways in general now say that they cannot undertake so large an extension of their responsibilities. In addition, financial operations of great magnitude and difficulty would be involved in the purchase of the existing wagons from their present owners.

Admitting the force of many of these contentions, we do not find in them a reason for inaction. It is clear that the general use of the 20-ton wagon is desirable; although no doubt for a long time to come a considerable proportion of the smaller wagons will be needed. It is clear also that the re-distribution of wagons is excessive. We cannot contemplate that ten or twenty years hence

* Wedgwood, Q. 14525 *et seq.*

the existing methods should be found continuing, with all their present waste unremedied.

On examining the situation it becomes clear that the absence of any important movement to get rid of these defects may be accounted for by the fact that it is the railway companies who would be the principal gainers by the change, through lower operating costs; while it is the mineowners and traders who, because they own two-thirds of the wagons, would have to play the chief part in effecting the change. It is true that some gain would accrue to the mineowners and traders; they would need to invest a less amount of capital, and would have to provide less siding accommodation. It is true also that the railway companies could assist the movement, since they own some part of the wagons. But in general, while the railways have an inducement to effect the change, the means of doing so are mostly not in their control. While the mineowners and other wagon owners have the means, the inducement offered to them is small.

The proposals which we make are based upon that fact. They proceed, not by way of prohibition or compulsion, but by way of inducement. This appears to be here, as in so many matters, the better course.

We suggest that measures should be adopted to secure that the economy to be effected in railway operating by pooling of wagons and by the use of large wagons, should accrue, in the greater part, to the benefit of the wagon owners; that the principle adopted by the Great Western Railway, in allowing a 5 per cent. rebate on the rates of transport for all coal carried in 20-ton wagons, should be accepted as the first step in a general policy.

Recommendations.

Our recommendations are these:—

1. The general saving in railway operating that may be expected in the several districts, if 20-ton wagons were substituted for those now in use, should be estimated. The railway companies should allow a rebate in rates corresponding to the greater part of this saving, retaining for their own benefit a minor part of it. The statutory regulation of rates should embody this proposal.

2. A similar estimate should be made of the saving in railway operating that would result if large combinations were effected of collieries and other wagon owners, who would consent to being supplied with wagons from a district pool. The wagons might be classified if necessary into two or three different types. All belonging to any one type would be used indiscriminately. There would be a considerable saving in shunting compared with the present practice, if, for example, in any particular district, collieries and other wagon owners formed a pool, consisting of not less than, say, 50,000, or whatever number might be thought suitable, of the wagons usually employed in that district, and

if they agreed with the railway companies to accept any among those wagons of the type required by them for particular purposes, or any similar railway-owned wagons. Here also the greater part of the financial benefit that resulted should be allocated to the wagon owners, in the form of a rebate on the transport of all coal carried in such wagons. If legislation is necessary to authorise this, it should be enacted.

3. In order that continuous attention should be given to these questions, and that progress should not be allowed to slacken for lack of stimulus, we recommend that the Ministry of Transport and the Mines Department should establish a Standing Joint Committee, with the title Standing Committee on Mineral Transport. It should consist of representatives of those Departments, with representatives of the railway companies, and the mineowners, and merchants. Its functions would be :—

- (a) To review the equipment provided for 20-ton wagons at the ports and railway terminals and at the collieries, and to make representations, when necessary, for its extension;
- (b) To promote the formation of pools such as are suggested above;
- (c) To promote the standardisation of wagons;
- (d) To undertake special inquiries :—
 - (i) as to the proper rebates in rates which should be allowed under the conditions previously suggested;
 - (ii) into such matters as the alleged greater loss from breakage through the use of larger wagons, and the method of avoidance of such loss, if any;
 - (iii) into the reasons for the small number of journeys per month travelled by the wagons, and the remedies;
 - (iv) if thought desirable, into the question of the use of canals for coal transport.

Power should be conferred on the proper Department of Government to make any regulations that might be found to be necessary, based upon the recommendations of the Standing Committee, for the standardisation of wagons. The Standing Committee should be required to make an annual report to Parliament on the progress made.

The result that may be anticipated from these measures is the gradual substitution, over a period of years, of the 20-ton wagon for the smaller trucks. It is probable that this substitution will be effected more rapidly in the case of transport for shipment. It may perhaps never be completely effected in the case of the distribution of coal to the smaller centres. The consignment to the larger towns, however, of great numbers of small truck loads,

or partial truck loads, to small merchants engaged in the retail trade, is unnecessary and wasteful ; it would be discouraged by the loss of the rebates on railway rates allowed in respect of the larger deliveries.

Certain other points need consideration :—

Representations by Ship-Owners and Others.

1. In evidence given before us on behalf of the Chamber of Shipping and the Liverpool Steamship Owners' Association, it was stated that, while the facilities for the shipment of coal at ports in Great Britain were on the whole good (although better use might be made of them), and the bunkering facilities were also good, there were certain economies which it was possible to suggest that would tend to reduce the price of coal. The witnesses referred in the first instance to the charges for trimming coal in the holds, or bunkers, and alleged that, while the charges have always been high in proportion to the labour involved, they have increased substantially as compared with the period before the war. On this point they added that there were numerous charges in connection with trimming, which were imposed during the war, or were definitely added in 1920, when the National Trimming Tariff was first agreed. The representatives of the shipowners also commented on the cessation of night work, which they urged was the economical and proper method of bunkering, and complained that the hours of work in coal ports were unsatisfactory, rather on account of their rigidity than of their shortness.* In this evidence more emphasis was laid on the injury done by the delay to ships than by the cost involved by the high wages that are paid. Mr. Ernest Bevin, the General Secretary of the Transport and General Workers' Union, gave evidence before us on these points. He asserted that the trimming charges for coal were less than on any other form of tonnage, and that reductions in the tariff had been accepted by the men after considerable negotiation, so that the war bonus part of the charges was reduced by nearly 70 per cent. With regard to the hours of work, he said that the hours were not more restricted now than before the war and that of coal, the men could not merely ship the now available supply in the 16 hours per day that were worked by two shifts, but could increase it by 30 per cent. to 40 per cent. if facilities, coal, and tonnage, were available and handicaps removed.

It must be remembered that, as the trimmers have organised themselves into co-operative bodies, which enter into direct contracts for the work to be done, their earnings cover the contractors' profits and overhead charges, which would be additional if contractors were employed. The men, on their side, have complaints to make as to the disabilities which they suffer owing to the work to be done not being properly systematised. We are of opinion that this is a matter which should be dealt

* Glover, paras. 34-42.

with by a conference between the various parties interested, and we recommend that steps should be taken to promote the summoning of such a conference.

2. We have to report that in the evidence given by the representatives of the mineowners, of the factors, merchants, exporters, shipowners and co-operators, complaint was made that the transport of coal has been conducted by the railway companies less efficiently of late than it was prior to the war, and prior, therefore, to the amalgamation of the railway companies. These complaints were traversed by the witnesses who appeared before us on behalf of the railway companies. The time at our disposal has not permitted us to enter into the elaborate investigation that would be necessary to enable us to form any opinion upon this point, and we abstain from expressing one.

3. The mineowners complain that the present machinery for determining the rates for the carriage of coal upon the railways does not permit the question of the wages to be paid to railwaymen being raised in that connection. This involves the issue of, the relation between the Railway Rates Tribunal on the one hand and the National Railway Wages Board on the other, a matter which is also not within our province, and which we are unable to pursue. We therefore do no more than draw attention to the fact that the point was raised by the representatives of the mineowners.

PART III.—EMPLOYERS AND EMPLOYED.

CHAPTER X.—GENERAL OBSERVATIONS.

Labour Disputes.

The mining industry has long been the theatre of unrest, which constantly gives rise to stoppages of work here and there, and occasionally develops into labour disputes on a vast scale. The statistics relating to the stoppages that have taken place in the years since the war, collected by the Ministry of Labour, are as follows :—

Table 11.

Year.	Number of Disputes.	Number of Workpeople involved.	Aggregate duration in Working Days.
1919	216	919,000	7,565,000
1920	213	1,407,000	17,415,000
1921	147	1,251,000	72,693,000
1922	155	116,000	1,246,000
1923	186	187,000	1,183,000
1924	190	134,000	1,563,000
1925 (Provisional)	162	129,000	3,450,000

(A table giving the statistics since 1900, with explanatory notes, is printed in Appendix, No. 28.)

Before considering the means of remedying this situation, it is necessary to get an understanding of the feelings that animate the two parties, and the reasons for them. First, therefore, we will briefly set out what we have gathered to be the complaints of the miners against the employers, and of the employers against the miners. In other chapters we examine these complaints one by one, and express an opinion as to their validity.

Grievances of the Miners.

Account must be taken of the fact, in the first place, that the present grievances of the mining population are frequently viewed by them in association with the grievances of the past. They are well aware of the history of their industry. Through reading and through family tradition, abuses which have been remedied and which may be forgotten by others, are kept alive in the memory. Many of the older men now working had gone to the mines themselves when they were young boys ; they can recall the low wages and the long hours of earlier days, the lack of proper care for safety, the abuses in the weighing

of minerals that preceded the passing of the Checkweigher's Act of 1887, and many another example of oppressive conditions. Men now of middle age worked in the mines when there was no general provision for the families of men killed, or for men themselves who were permanently injured. Twenty years ago there was no compensation for diseases contracted through the work, fifteen years ago no pensions for the aged, one year ago no provision for widows and orphans. It is of course recognised that the progress in these matters has been great. But the men know that in many, perhaps in most cases it has been won by their own efforts, often in the face of strong opposition. The progress is frequently regarded less as a cause for gratitude, than as a reason for believing that the hardships that still exist, and are represented as unavoidable, may be as unnecessary and as open to remedy as those that have in fact been abolished.

The grievances that remain are held by the miners to be serious enough. The wage scale is considered to be, at best, no more than adequate. In good average times, with regular work, and for the higher paid classes, the pay, they consider, is no more than a decent remuneration for men engaged underground in an arduous and dangerous occupation, demanding a considerable measure of training and skill. In bad times, and if work is irregular, and always for the lowest paid classes, the pay is held to be plainly insufficient.

They contrast their own remuneration with the large dividends declared by colliery companies in times of good trade. To those profits, they say, must be added the distribution from time to time, as windfalls to the shareholders of some of the companies, of bonus shares, sometimes adding a half or more to the money originally invested. They are inclined to suspect—many feel convinced—that when coal is sent from the collieries to other businesses financially connected with them—and nearly one-fourth of the coal is transferred in this way—the price accepted by the collieries is often below the true market value; as a result their own wages, which are regulated by the receipts of the industry, are artificially lowered, and a part of the profits actually made by the employers is concealed.

If, however, the collieries fall upon bad times, and profits are low, or if public opinion complains that the price of coal is too high and that other industries are suffering, the miners resent the suggestion that to lower their standard of living is the proper remedy. It is the quickest and the easiest recourse, but not, in their opinion, the only or the right one. They believe, from their working knowledge, that many of the collieries are inefficiently managed, and think that the losses of the collieries are often due to such inefficiency; they feel that they are given few opportunities for suggesting improvements which their practical experience might enable them to make. They believe that output is frequently hindered by the failure of the management to supply the hewer

with sufficient tubs, or other requirements, to enable him to get the best results ; they have, in some cases, daily experience of the waste of their own time, and therefore the additional costs to the colliery, that are due to long travelling underground ; sometimes they know that this waste is caused by the bad lay-out of the mine, owing to the leases of coal being dependent upon the boundaries of land-owners' estates. They point to the slow progress in making more scientific use of the coal. They point to the large difference between the price of the coal at the pit-head and the price to the consumer, and believe that much of this is due to wasteful methods of railway transport, to an excess of middlemen and to their high profits. They continually dwell upon the payment of royalties to land-owners in return for no service, a payment which is equal to an average charge of two shillings every week upon the wages of every man and boy employed in the industry.

They complain that the accident rate is still far too high, and that although it has greatly diminished for certain classes of accident, it is showing little reduction for others. They suffer from occasional stop days, when the mine does not work owing to lack of transport, or mechanical breakdown, or other such causes, and the men lose their day's pay in consequence ; but this they seem to regard as one of the necessary drawbacks of their occupation, and we have heard little complaint with respect to it.

There is much discontent with the conditions of housing, which so closely affect well-being. The houses are often uncomfortable and over-crowded, and domestic life suffers in consequence. Many of the men are dissatisfied at having to travel to their houses in working clothes, dirty from the pit, and at the labour thrown upon the women-folk, and the discomfort caused in the home, by the daily bath that each worker requires, having to be provided there instead of at the pit-head.

If there be surprise that the miner of to-day accepts these disabilities and discomforts with less patience than the miner of a previous time bore a greater hardship, the explanation is found in the fact that the standard of civilisation of the whole people is higher than it was ; that the present generation of miners are better educated and often more studious than their forbears ; and that grievances which may be less in substance than those that were endured in an earlier day, are not less serious when they are related to the higher standard of life that now obtains.

Such are the ideas that prevail, not among all, but among many of the miners. Discussed and rediscussed again and again, constantly reinforced by fresh examples offered by a widely read Press, disseminated by the continuous propaganda of labour leaders, they are fruitful sources of the unrest.

Grievances of the Employers.

On the other side, the employers resent the accusations levelled against them, which, in the main they feel to be unjust. The abuses of a bygone day, which have long disappeared, have nothing to do, they consider, with the affairs of the present. They regard the existing disabilities of which complaint is made, as being sometimes unavoidable, as in the case of inferior housing at collieries which will soon fall out of working; sometimes, as in the case of certain classes of accident, to be avoidable only through greater care on the part of the men themselves. The grievances, they are convinced, are often deliberately exaggerated, in order to support the political case for a fundamental change. The Mining Association, at their final evidence before us, declared that:—

“ The unrest in the mining industry has not been the
“ spontaneous expression of dissatisfaction on the part of
“ the mass of the workers themselves, whose wages have
“ been higher and employment more regular than those of
“ workers in the other heavy industries; but it has been
“ the result of a deliberately planned attempt on the part
“ of the miners’ leaders to prevent the reconstruction of
“ the industry under private enterprise after decontrol, in
“ order to force upon the nation the political policy summed
“ up in the phrase ‘ The Mines for the Miners.’ ”*

In fact, they consider that the Miners’ Federation, so long as it adheres to the policy of nationalisation, does not desire to come to agreements with the employers, but to destroy them—to secure their elimination from the industry altogether.

If wages are lower than they might be, or prices higher, they attribute the cause mainly to the action of the men themselves, in insisting upon hours of labour so short as to make the working of the mines unduly costly. A contributory cause is sometimes alleged to be that the men do not do their best to produce a satisfactory output, even during the short hours when they are at work. They point to an obstructive attitude in some districts and on particular occasions, towards the introduction of machinery, or the more economical working of the mines by means of double shifts. They point to the frequent absences from work of the miners, and especially of the hewers, on whom the whole working depends, an absenteeism without good cause and at the men’s own caprice, which results in disorganisation and loss. They instance the not less serious disorganisation and loss occasioned from time to time by unauthorised stoppages of a whole mine, in order to secure the remedy of some trifling grievance, which could have been easily disposed of by discussion.

* Evan Williams, para. 2

As to the proceeds of the industry, the employers emphatically deny that the price at which coal is transferred to associated businesses is in any way unfair. If the profits in some years and in some districts are large, the industry has always been a fluctuating one. Other years bring low profits or none; many expenditures prove unremunerative; all expenditure in sinking new pits is unremunerative for a number of years, the initial capital having often to wait ten years before it brings a return. What is termed the distribution of bonus shares, is simply a means of keeping in the business profits that have been made, instead of distributing them. It does not imply any "watering of capital"; the new capital represents actual expenditure upon the equipment of the mine, and its creation is a proper method of promoting the progress of the undertaking.

In general the employers, who are no different from other men, strongly resent the attacks made upon them, which they regard as being the outcome, not of real grievances, but of political propaganda. Their view is shared by the mining engineers, and was expressed in the following terms by the witnesses who appeared before us on behalf of the Institution of Mining Engineers:—

"The Council wish first to express in the name of the Institution the resentment of British mining engineers at statements which have received widespread publicity, to the effect that coal-mining in Great Britain is carried on with a general want of humanity and insufficiency of technical skill and scientific knowledge in comparison with other industries; that British mining engineers are willing to serve owners who are not as solicitous as they are about humanity, safety, and efficiency; that they willingly employ miners who are not equally solicitous. The Council claim that the history of the British coal-mining industry shows that whatever actual defects are present in it, it is on the whole carried on by men who, whether they are manual workers, or engaged in duties of supervision, management, or financial control, are very strongly inspired by the ideals of good and loyal citizenship which have made the British Empire what it is."†

Other Aspects.

This review appears to indicate a situation of great gravity. But we do not feel convinced that these antagonisms and recriminations should all be accepted at their face value. That grievances are strongly and sincerely entertained on the one side and on the other, there can be no doubt. But perhaps there is a greater tendency to goodwill, and a greater readiness to attempt to remove grievances that are found to have substance than would at first sight appear.

† Haldane, para. 2.

If stoppages are numerous, it is satisfactory to remember that the difficulties that are settled without stoppages, through the conciliation machinery established by the industry itself, are probably a hundred times as numerous. If the Miners' Federation, in their evidence before us, made strong animadversions against the present management of the industry, they did not fail, in their final memorandum, to declare "It is not suggested that the "deficiencies of the existing system are mainly due to personal "shortcomings on the part of those by whom the industry is af "present conducted. It is evident, indeed, that in the course of "the last century scientific knowledge, enterprise, and technical "skill have all contributed to the development of the British coal "industry. The question, however, is not merely whether "individuals have been intelligent and enterprising, but whether "the system within which they work, and which, as individuals, "they can alter only with great difficulty, is such as to make the "best use of their intelligence and to direct their enterprise to "the greatest public advantage."* If the Mining Association did not spare their criticisms of many of the activities of the men's organisation they also, in the final memorandum presented by them, spoke in the following terms :—

"The Association desire to state in the most emphatic "and public manner that though they have felt it their duty "to comment in strong terms upon the policy pursued by the "Miner's Federation, yet their members are willing, as they "always have been, to enter into district negotiations on the "lines indicated, with the utmost goodwill and friendship, "and with the single aim to do what is best for the nation "and for the industry and all the grades of those who are "engaged in it."†

We have reason to think that such mutual hostility as there is between the central bodies is not a true reflection of the spirit that prevails in the country at large. We were impressed by the fact that, during the visits which we were ourselves able to make to the coalfields, we heard at every mine we visited, almost without exception, expressions on the part of the managers of a sincere feeling of goodwill and of respect for their employees, and a recognition of the essential reasonableness, as a general rule, of the agents who had been chosen to represent them. Nor did we find on the part of the men's representatives any different attitude towards the managers. Our experience is confirmed by the testimony that reaches us from other quarters.

But it would be neither just nor prudent to regard good personal relationship as a substitute for the remedy of well-founded grievances, if such grievances there be; to urge an attitude of greater friendliness and to be content with that.

* Tawney, Memo. No. 5, para. 2.

† Evan Williams, para. 38.

Appeals for peace are more likely to succeed if they are made after, and not before, the investigation and the removal of the causes that threaten quarrel.

If we have thought it advisable to set out, in this chapter, the complaints that have reached us from the one side and the other, it is in order that the realities of the situation should be understood, as a preliminary to an effective dealing with them. Into the validity of some of these complaints, touching such matters as the organisation of the industry, the use made of coal, its transport and retail distribution, we have already inquired in preceding chapters. The others will be examined in the chapters that follow.

CHAPTER XI—OUTPUT.

The yearly output of coal in Great Britain per head of all persons employed in mining has been falling, on the whole, during the last fifty years. In the five years 1879–1883 it averaged 319 tons per head; ten years later, in 1889–1893, it was 282 tons; twenty years later still, in 1909–1913, just before the war, it was 257 tons; for 1924 it was 220 tons, and for 1925, 217 tons. These and similar figures, to which a good deal of publicity has been given, readily suggest the idea that, since the output of each person employed in mining is falling so rapidly, individual miners have been progressively and deliberately restricting their output or otherwise declining in personal efficiency. There is in many quarters an impression that the British miner could and should work harder than he does, and that the difficulties of the coal industry are, in part at least, due to a growing practice of "ca' canny." This point calls for full examination.

Expert Opinion on Restriction of Output.

It is important to notice that the impression just mentioned found no support from any of our expert witnesses. Sir Richard Redmayne, Mr. H. F. Smithson for the colliery managers, and Mr. W. Frowen for the deputies and firemen, agreed in rejecting the idea that there was anything like organised or general restriction of output by the miners.*

Mr. W. A. Lee, on behalf of the Mining Association, submitted that there was deliberate restriction of output in certain cases, but practically reduced these cases to two: one being the daily "stint" which was all that the men would work in certain anthracite collieries, and one arising when coal-cutting machinery was about to be introduced and the fixing of new piece-rates was under consideration.† As to the first point, there is some reason to believe that the charge of deliberate restriction of output to a fixed "stint" in certain anthracite collieries is well founded. It applies, however, to a very limited part of the mining industry, and in any case, according to Mr. Lee himself, is an old-standing custom.‡ There is no assertion of any progressive restriction of output, such as would be necessary to account for the decline of output per head. As to the second point, this is one of the standing difficulties of all piecework trades, and it is one to which we make some reference in the chapter dealing with Wages. It, like the anthracite "stint," is obviously of quite limited application, and in any case can be no explanation at all of a fall in output per head.

* Redmayne, Q. 2598–2601; Smithson, Q. 10570; Frowen, Q. 11971.

† Lee, Q. 5680–5699.

‡ Lee, Q. 6319.

To these two cases named by Mr. Lee may be added Mr. Smithson's reference to the tendency of hewers to relax their efforts when their piecework earnings were likely to be little above their legal minimum wage. "If ever such a thing did come about that the colliers were put on to day wages instead of contract work the cost of production in this country would go up not by pence but by shillings per ton."* In fact the colliers themselves, that is the men directly engaged in getting coal at the face, are in practically all cases paid by the piece, and Mr. Smithson did not suggest that the tendency to which he referred was general. His case is as exceptional as Mr. Lee's. For "ca' canny" as a cause of generally declining output there is no support at all in the opinion of experts.

The Interpretation of Output Statistics.

Is there any conflict between these opinions of experts and the recorded statistical facts? A moment's consideration shows that there is none. Such figures as have been cited, of the yearly output per head of all persons employed, are not merely no proof, but are not even the slightest *prima facie* evidence of declining efficiency or industry on the part of the men. The miner is only one factor in the production of coal; his output in any given time depends, not on himself alone, but on two other factors—of at least equal importance and often of greater importance—the physical conditions of the mine and the efficiency of management.

The fact that the average yearly output for each person employed in mining is in Britain less than one-third of what it is in America and 50 per cent. more than it is in France or Belgium is no ground at all for thinking either that the British miner is personally less efficient than the American, or that he is personally more efficient than the Belgian or French one. Physical conditions and the organisation of mining in the various countries are not comparable.

In the United States, the deepest bituminous coal mining operation is less than 1,000 ft. from the surface, and the average depth of the shafts is about 260 ft. Less than a quarter of all the mines have shafts at all; the rest are approached by horizontal "drifts" or downward "slopes," or are "strip" mines worked in the open after shovelling off the earth above the coal. In Great Britain more than half the coal now being worked comes from depths greater than 300 yards, and nearly a quarter comes from depths greater than 500 yards. In the United States 40 per cent. of the bituminous coal output comes from seams 6 ft. and more in thickness, and only 19 per cent. from seams of less than 4 ft. In Great Britain, half the output comes from seams of less than 4 ft., and 10 per cent. only from seams 6 ft. thick or over.†

* Smithson, Q. 10570.

† The statements in this paragraph are based for Great Britain on colliery returns summarised in Appendix No. 18, of our Report, and for America on Mineral Resources of the United States for 1917 (Part II), p. 944, and for 1918 (Part II), p. 1375.

Between Great Britain and the coalfields on the European continent the contrasts are less striking. A very interesting comparison of conditions was submitted in evidence by the Institution of Mining Engineers.* Balancing one thing against another, it is probably fair to say that the Belgian conditions are certainly, and the French are probably, a little more difficult than the British, while those in the Ruhr are nearly equal to them.

Local Variations of Output.

The output per person employed is found to vary widely, not only from one country to another, but, within each country, from one district to another and from pit to pit. Thus, in 1924 the year's output per person employed was 255 tons in Scotland and 252 tons in South Yorkshire, while it was only 210 tons in Durham and 186 tons in Lancashire and Cheshire. In the same year, the output per head in the smallest mines, employing less than 50 men each, was 177 tons, while nine large mines in South Yorkshire had an average output of 280 tons.† Obviously such differences have little or nothing to do with the personal efficiency of the miners; they reflect differences in the age of the coalfields (South Yorkshire is comparatively new, while Lancashire and Durham are old), in the capital equipment of the mines (Scotland is the district where coal-cutting machinery is used most freely), and in other matters beyond the control of the individual workman.

Even when comparison is made for the same country or the same district at different dates, a decline in the yearly output per person employed is no evidence of restriction of output by the miner. The figure of yearly output per person employed above and below ground is for various reasons a dangerous one to use.

First, it does not allow for differences in the regularity of employment from year to year. The number of persons employed is a single figure given at the end of the year by each colliery, to represent either the average or the maximum number of persons on the colliery books at any time in the year, whether regularly employed or not. In a year of good trade, when the mines are working well over 5½ days a week on an average, the yearly output will naturally be higher than in a time of bad trade and unemployment, when they are working perhaps only 4½ days a week. The error involved in using statistics of yearly output can be diminished, either by making some allowance for known differences in the regularity of working, or by comparing not single years, but averages for series of years together, so as to include in each series a fair share both of regular and of irregular employment. The fallacy can be removed altogether only by comparing, not the output over a long period such as a year, but the output for each shift worked.

* See Appendix No. 15.

† See Appendix No. 18 (Table 7).

Statistics of output per shift are now available, and the following table, based upon them, sufficiently illustrates the danger of using yearly figures :—

Table 12.

				Yearly Output per head (tons).	Output per man-shift worked (cwt.).
1922	..	..	..	217	18·02
1923	..	..	..	229	17·83
1924	..	..	..	220	17·52
1925	..	..	..	217	18·02

The yearly output per head is lower in 1922 and 1925 than in either of the intervening years, but the output per man-shift worked is higher. Unfortunately output per man-shift cannot be given for any period before the war, except the single month June, 1914.

Increase of Off-hand Workers.

Second, a figure of output, based upon the total number of persons employed above and below ground at the face or elsewhere, does not allow for possible changes in the proportions of different classes of workpeople; that is to say, for changes in the organisation of the industry on its labour side. Investigation shows that in the past twenty years at least, there have been very marked changes in the structure of the industry, and so in the proportions of different classes of persons employed. The statistical returns collected by the Miners' Eight Hour Day Committee for the year 1905 fortunately make possible a comparison between that year and the present time in respect of these matters. From this comparison the following broad results emerge.

There has been a general tendency during the past twenty years to lower the number of persons working at the face in proportion to the total numbers underground; that is to say, to increase the proportion of "off-hand" workers to "face" workers. In 1905 there were 58 face workers to 42 off-hand workers. In 1924 the proportions were 51 : 49. There was in the same period a similar, although less marked tendency to lower the number of all underground workers to all persons employed; that is to say, to increase the proportion of surface workers. The result of these two tendencies may be summed up as follows :—

For every 100 persons actually engaged at the coal face there were in 1905 72 other persons working underground; that is to say, on the lines of communication between the face and the shaft; while there were 42 persons on the surface, making a total of 114 others for 100 at the face. In 1924, for every 100 workers at the face there were 95 others underground (in place of 72), and there were 50 on the surface (in place of 42), making a total of 145 others altogether (in place of 114) to deal with the output of 100 persons at the face. In other words, the output of every

100 persons at the face has now to provide a living for 31 additional persons employed away from the face, either below ground or above ground. The causes and consequences of this striking change in the proportions of different classes will be considered later; for the moment the point to consider is its bearing upon statistics of output per head.

The Hewer and his Output.

The annual output of saleable coal per person employed above and below ground fell from 278 in 1905 to 220 in 1924, or 21 per cent. If, however, the output is calculated per head of those below ground, the fall is 20 per cent., while per head of those at the face the fall is 10 per cent. Making such allowance as is possible for the lesser regularity of employment in 1905 than in 1924, the fall of output per shift must be estimated at something greater than this. It may probably be fairly put in the neighbourhood of 15 per cent., corresponding to an output per man-shift at the face of about 53 cwt. in 1905 and about 45 cwt. in 1924.

Between these two dates there were two statutory restrictions of hours—in 1909 and in 1919. The combined effect of these, assuming no change in meal times and travelling times underground, would be to decrease the net working time at the face by something over 18 per cent. This is a little more than the fall of 15 per cent. in the output per shift worked at the face. Another calculation, based on different material and described in Section 4 of the Annex to this Report, shows a fall in output less than 15 per cent. There is therefore good reason for thinking that the output per hour at the face has actually increased rather than decreased.

These figures are necessarily rough approximations. No allowance is made in them for changes in working conditions, other than restriction of hours underground. Some of these changes, such as the introduction of coal-cutting machinery and of conveyors, will have tended to increase output; since, however, the percentage of coal cut by machinery even in 1924 was less than a fifth of the whole, this factor is not yet of great importance. On the other hand, physical conditions have probably on the whole tended towards a decreased output, either by increased difficulty of working or by increased travelling time to the face underground. Probably increased machinery has at most compensated for growing physical difficulties in the working of thin and hard seams.

The broad result of this investigation is to suggest that there has been no marked change in the personal efficiency or industry of the workers at the coal face, and that whatever change there has been has probably been a change in the direction of increasing their output per hour. This is a natural consequence of the decreased number of hours in the day.

Conclusion as to Charge of "Ca' Canny."

Statistics properly interpreted and the opinions of experts are thus fortunately in accord. Both agree also with expectations founded on common sense and appreciation of the conditions under which the man at the face has to work. These conditions are such as to make deliberate restriction of output exceedingly unlikely. The collier has to be down in the mine for a certain time; there is nothing for him to do there except work; he is almost invariably paid by the piece; working up to his full capacity may mean taking back 18s. or more to spend in the daylight above, when deliberate idling means taking 12s. In the circumstances, one would not expect, as one does not find, any evidence that persons working at the coal face restrict their output when they are at work. One might expect and one does find that, inasmuch as colliers, like others, occasionally wish to take life easy, they do so, not by working slackly when below ground, but by having a day off work altogether now and again; there is no penalty for this except the loss of that day's wages. From this comes the harmful practice of voluntary absenteeism. As, however, absenteeism has certainly declined rather than grown in the last twenty years, it can be no explanation of falling yearly output.

No basis is left for any general charge of "ca' canny" against the men directly concerned with output. Nor is any such charge advanced by the Mining Association, though unfortunately some of the propaganda conducted on their behalf or with their assistance proceeds on other lines. How do matters stand with the counter-charges of inefficiency brought by miners against the management? It is interesting to note that, in their final memorandum of evidence, the Miners' Federation disclaimed any criticism of the personal abilities of those who conduct the industry.

In the memorandum already cited by us, and in oral evidence Mr. Tawney made it clear that the main criticism of the Federation was directed against the system under which the industry is conducted rather than against individuals.*

The two charges of "restriction of output" and of "inefficiency of management" are no doubt mutually connected. Mine managers, doing as they feel their best in difficult circumstances, may naturally meet a charge of "inefficiency" on their part by laying stress upon anything that can be described as idleness or obstructiveness on the part of the men. Miners resenting the charge of deliberate restriction of output, for which there is certainly no general foundation, as naturally make the most of any hindrances to output that they experience, whether through shortage of tubs, inferior equipment or bad organisation.

In view, however, of the considerable volume of complaints as to mismanagement at particular mines, it appeared advisable to test the matter and to arrange for expert examination of typical cases. After discussion of various alternative plans, it was

* See page 113 above and Tawney, Q. 16966.

arranged that the Miners' Federation should select a number of mines as to which specific complaints had been received, and that the Commission should take steps to have expert impartial investigations made on the spot.

Investigation at Pits.

For this purpose the services of a number of Mines Inspectors were placed at our disposal by the Chief Inspector. They were chosen for their work as men having experience of the mining conditions in the districts in which the investigations were to be carried out. Previous notice was given in each case to the owner of the colliery as to the nature of the complaint and the name of the inspector. It was arranged further that the workmen concerned could be represented at the inquiry by, whomever they or their Union selected.

Under this scheme 42 collieries in all, distributed throughout the country, have been inspected. The proposed report of the inspector was submitted in each case to the representatives of the owners and the workmen, asking them for their observations before it was sent forward. The reports were confined to questions of fact, and were in practice generally agreed to by both parties concerned, though in one or two instances amplifications and criticisms were offered.

The reports have been carefully examined by one of our assessors, Mr. H. M. Hudspeth, and we print in Section 5 of the Annex his comments upon them. A synopsis of the reports themselves is given in Appendix No. 40.

Our own general conclusions, as the results of this investigation, are as follows :—

- (1) A large proportion of the complaints made deal with matters of very little importance or are based on misunderstandings. This was only to be expected.
- (2) On the other hand, in the actual collieries inspected there is a substantial body of cases in which output is being hindered to some extent by such defects as shortage of tubs, bad roads, and insufficient mechanical haulage. There are also cases of antiquated equipment, though it is not clear that in all of these it would be worth while to instal new equipment.
- (3) The actual collieries inspected cannot be taken as typical of all the collieries in the country. A few of the collieries selected by the Miners' Federation were stated to have been selected as being average collieries and a few for special reasons. Naturally, however, the selection of collieries as those from which complaints had been received led to their being on the whole below the general average in efficiency.
- (4) The complaint which appears to us to be the most generally well founded is that of excessive underground

travelling on foot. This is a matter to which some colliery managers do not attach sufficient importance. The remedying of it, by riding men in or by sinking of additional shafts, should be undertaken wherever reasonably possible.

- (5) Generally, there is nothing in the results of our inquiry to suggest that colliery managers as a whole are doing otherwise than making the best of their position. As in all occupations, some individuals are better than others. The case for changes in the organisation in the industry, and in particular for a gradual movement to larger units of administration, must rest, not upon the examination of individual collieries and of individual complaints, but upon the broad considerations which are set out elsewhere.

Mechanical Equipment.

It is important to refer to some of the steps which have been taken to increase the capital equipment of mines and in particular to introduce machinery for cutting and conveying coal.

The use of coal-cutting machinery in Great Britain dates practically from the beginning of the present century. In 1901 only 1½ per cent. of the total output was cut by machinery; by 1924 the proportion had grown to nearly 19 per cent. This is a rapid growth, but starts from a low basis. In America at the beginning of the century 25 per cent. of all the bituminous coal was cut by machinery and the proportion is now nearly 70 per cent. The conditions of the two countries, of course, are very different, but in some ways machinery is needed here even more than in America. It makes possible the exploitation of thin hard seams which would otherwise not repay working; it is particularly suited to the conditions of Scotland and is most widely adopted there, accounting for nearly half the Scottish output. In some districts, such as South Wales, coal-cutting machinery is held to be less generally suitable; on the other hand, mechanical coal conveyors are fairly extensively adopted.

We heard nowhere of opposition by the miners to the introduction of machinery. There is often a natural dislike among the older men to new-fangled notions. The problem of fixing new piece-rates has always to be solved. But, generally speaking, if the manager seriously wishes to try machinery, he is able to do so.

The position in respect of machinery is thus hopeful. The British coal industry was certainly late in starting with machinery, but substantial progress has been made. During the past six years not less than £44,500,000 has been spent on new capital equipment, renewals and replacements.* But the physical difficulties to be faced are serious, and nothing but the most strenuous application

* See Appendix No. 26.

of technical skill with the fullest use of capital can meet them. It is not sufficient to possess, as we believe this country does possess, a body of mining engineers second to none in skill, experience, training and ingenuity. It is essential to secure that these qualities are applied, and that the system of mineral ownership and the organisation of the mining industry are such as to give them unfettered scope. It is not sufficient that the best of our mines should be, as we think they are, unsurpassed in efficiency by those of any other country in the world. It is necessary that all our mines should be brought as nearly as possible to the level of the best.

Increasing Physical Difficulties.

Great Britain has had a large mining industry exploiting its mineral resources for generations longer than any other country in the world. For this very reason that industry must fight against physical conditions of steadily increasing difficulty. This fight need never be a losing one; technical progress and wise planning often make it easier now to get coal from a hard 2-ft. seam, or from 3,000 ft. below the surface, than an earlier generation found it to work a 6-ft. seam at 300 ft.; technical progress may bring within reach coal now ruled out as inaccessible and valueless. The fact of growing difficulty remains; the easy coal in Great Britain has long been taken; production is maintained by drawing year after year from greater depths or thinner or more difficult seams.

An interesting measure of this process is afforded by returns which were made by the collieries of the amount of coal won by them from seams of differing thickness and depth below the surface, in 1913 and in 1924 respectively. In the former year 55 per cent. of all coal came from seams of 4 ft. thick and upward, in 1924 this proportion had fallen to 51 per cent. In depth the change is less marked but of the same type. In 1913 81 per cent., but in 1924 only 77 per cent., came from within 500 yards of the surface. Broadly, the movement is either downward to find a thicker seam or occasionally upward to work by machinery a thin seam previously neglected. There is no need either for mine-owners to blame miners, or for miners to blame mine-owners, for their common fortune or misfortune of living in an old country, with coalfields past their early prime.

The examination made earlier in this chapter of the proportions of different classes of workpeople is of importance from other points of view than that of testing accusations of "ca' canny" against the hewers. The examination reveals, in the growing proportion of men away from the face and on the surface, a feature of the mining industry hitherto hardly noticed. What are its causes, and what may be its consequences?

Of the causes for the increase of "off-hand" workers, it is impossible without much fuller investigation than we could make to give any complete account. Almost certainly several causes have contributed. One of these is to be found in additional safety regulations, particularly under the Coal Mines Act of 1911. Another is probably the reductions of working hours in 1909 and again in 1919; for more than one reason these reductions might make it necessary to increase the number of off-hand workers more than the numbers at the face. A third reason is the additional work undertaken at many collieries in screening and washing coal. Yet a fourth possibility is that the number of off-hand men below ground is in some cases at least excessive; a legacy of war-time control when the numbers of men were remarkably increased. Finally, the most natural and general explanation of an increase in the number of off-hand men, that is to say of the men on the lines of communication between the face and the shaft, in proportion to the men at the face itself, is that the lines of communication as a whole may have become longer or more difficult to maintain. Our investigations have not allowed us to test directly this last hypothesis. But it is at least possible, and not unlikely, that the growing proportion of off-hand men is in part at least a reflection of the growing physical difficulties with which British mining has to reckon now and in the future.

Interest in Output for Off-hand Men.

Whatever the causes may be, the consequences are serious. Increase in the proportion of off-hand men means, under existing wage arrangements, an increase in the proportion of men who are neither themselves paid by the piece nor working in immediate contact with piece-workers. The men on the lines of communication, engaged in haulage and in the upkeep of the roads, can materially affect the output of the mine as a whole, and of the face-workers in the district which they serve. Yet they themselves, as a general rule and subject to many detailed exceptions, have no direct interest in the output. Insofar as they have any interest at all, it may be in favour of a small output, which will give them less coal to handle or less damage to repair for their fixed day wage. It is among them, if anywhere, that one would expect to find a readiness to favour restriction of output and to urge it as a principle upon the men engaged at the face. It is in slowness or carelessness on their part—in sending on tubs or repairing damage—that may sometimes lie the explanation of what appears to the man at the face to be inefficiency of the management. We have, indeed, no direct evidence of restriction of output or of slackness among such offhand men. They, like the face-workers, however, are working below in isolated groups, hard to supervise. On general grounds it appears to us to be a matter of great importance that steps

should be taken by changes of the methods of their remuneration to give the off-hand men generally an interest in output—either in the form of a bonus on the output of the colliery or each part of it, or in some other form.

Another consequence, of more general significance, has already been noted. The growing number of off-hand men involves a growing burden on the labour of those at the face. The coal got by 100 men at the face, in a shorter working day, has now to provide a living for 245 workers altogether as compared with 214 twenty years ago. If the standard of living is not to be lowered, the highest possible efficiency and output are imperative.

The argument is thus strengthened that may be addressed to the men for the withdrawal of objections, wherever they still exist, to the working of multiple shifts, for the withdrawal in those few and limited cases, where they exist, of any practices or understandings leading to unnecessary restriction of output, for the reduction of voluntary absenteeism, and for the welcoming of any changes in methods of remuneration that may give to all workers an interest in the results of the colliery. This may be put both on general grounds, and on the special ground that some at least of the growing burden of off-hand labour arises from regulations made in the interests of the men themselves, for their safety or for their greater leisure.

The argument is as strong or even stronger to those who manage the mines, that they should let no vested interests or old habits stand in the way of whatever reorganisation may hold the promise of greater efficiency. On them, far more than on the men, does the country depend for power, by improvements whether of technique or of organisation, to compensate for the inevitable deterioration of the physical conditions of mining in a country whose easy resources have long been worked out. That a material increase of the average output of British mines in relation to the labour employed is both possible and necessary, there can be little doubt.

Possibility of Increasing Output.

The possibility of increasing output, even in an old country, may be illustrated by two sets of facts, one relating to Britain and one to Germany.

The first set of facts is that showing the great differences, in the output per shift worked, that now exist between different undertakings, and particularly between undertakings of different sizes. The returns made to us by the Joint Accountants under the Wage Agreement show a difference of about 3 cwts. in output per man-shift between the smallest class of undertakings, each

producing less than 200,000 tons a year, and the large undertakings producing 1,000,000 tons and upwards. If all undertakings could come up to the level of efficiency of the large ones, the problem of restoring prosperity to the industry would be a long way nearer to a solution

The second set of facts is that relating to output in Germany, and particularly to developments during the past year. Taking the Ruhr alone, the output per man-shift in 1913 was 934 kilogrammes. In 1924, when the industry was still suffering from the after-effects of military occupation and industrial disputes, it was 857 kg. In the first half of 1925 it had risen to 905, and in the last five months, from July to November, 1925, it has averaged 986; in November alone it was 1,022 kg. Although the length of the shift is half an hour less than in 1913, the output per shift is materially greater. This is a remarkable achievement, whether it be due to the improved skill or energy or contentment of the workers, or to the improved technique of the management, or to the closing down of uneconomic mines and concentration upon the better mines. What has thus been done in Germany should not be impossible here. What has thus been done in Germany invites attention to some of the outstanding conditions, differing from our own, under which it has been done. In the whole Ruhr, with an output about two-fifths of the whole British output, there are 70 colliery undertakings as against 1,400 here; each undertaking represents a combination for power, buying and selling; none of them own wagons, for these are all part of the railway pool; all of them give the miner's remuneration in part in the form of family allowances; all, it may be added, have pit-head baths.

Need for Increasing Output.

The necessity for increasing output can be shown most readily by reference to figures such as those with which this chapter began.

Statistics of yearly output per head of all persons employed in mining, though they are of no value as tests of the individual miner's efficiency, are of great value as an indication of the sort of living he can expect to make at any time, in comparison with other times and with other countries. Material for such comparison is given in the two tables that follow.

The first table shows for five-year periods from 1874-78 onwards the average yearly output per head of all persons employed in coal mining in Great Britain, France, Belgium, Germany, and the United States. The same figures are presented graphically in the chart at the end of the volume.

Table 13.
OUTPUT OF COAL PER PERSON EMPLOYED IN
VARIOUS COUNTRIES.

Period.	United Kingdom.	France. ¹	Belgium. ²	Germany. ³	United States. ⁴		
					Bituminous.	Anthracite.	Total.
<i>Yearly Average.</i>				<i>Tons.</i>			
1874-78	270	154	135	209	341	323	327
1879-83	319	187	163	257	505	374	427
1884-88	319	196	173	269	449	340	398
1889-93	282	201	168	257	503	349	444
1894-98	287	208	174	262	511	336	447
1899-03	289	198	169	247	616	370	542
1904-08	283	194	162	251	617	423	568
1909-13	257	195	159	256	698	449	636
1914-18	252	152	125	286	782	498	710
1919-23	195	132	135	163	656	481	623
<i>Year.</i>							
1924	220	149†	136†	[209]	697	491	655
1925 (Provisional)	217	152	141	[234]	Not available		

¹ Includes Alsace-Lorraine from 1919, but excludes the Saar throughout. The first figure relates to three years 1876-78 only, and the next to 1882-83.

² Includes Limburg from 1917. The Belgian figures throughout, like the German ones from 1914-18 onwards, are based on an assumed number of "full workers," *i.e.*, the number of persons required to produce the recorded output if both mines and men had worked continuously without unemployment or absence.

³ Excludes ceded territories (Alsace-Lorraine from 1918; Saar and Hultschin from 1920 and Upper Silesia from June, 1922). The German figures, as usually published from 1909 onwards and as given above from 1914-18, are calculated on a different basis from the earlier ones. The figure of 256 given above for 1909-13 is a corrected one comparable with the earlier ones, but not with the later ones. The uncorrected figure for 1909-13 would be 265. The bracketed German figures for 1924 and 1925 are doubtful; the true figures would not be less than those printed.

⁴ The American figures in 1874-78 represent only one-fifth of the industry and in 1879-83 only 54 per cent.

† Provisional figure and subject to revision.

British Mining and its Rivals.

The table with its sharp contrasts between the Old World and the New, suggests one obvious reason why miners in America, with their three or four-fold greater output, are likely to find

possible a higher standard of living than miners in Europe. It explains too, why, since coal is man's chief aid to production of material goods, the same advantage in prosperity extends through all classes of a people which can get its coal so easily.

Another set of contrasts appears if the course of events be traced, in each separate country, from 1879-83 down to the war. The American bituminous output rises sharply from 505 tons to 698 tons per head; the French, German and Belgian outputs remain substantially unchanged near 200, 250 and 165 tons respectively; the British output falls from 319 to 257. In the last years before the war Great Britain is at the German level; in 1925 Great Britain is below the German level, having started 25 per cent. above it 50 years ago. British mining, even before the war, was thus losing ground relatively to other European countries, as well as to America. The table brings out, on the one hand, the growing competition that British coal had to face, directly in the export trade and indirectly in all manufactures based on coal; on the other hand, the difficulty of maintaining for the British miner those advantages in comfort and in leisure over his European fellows that once had seemed to be his birthright.

Statistics of output alone, without reference to price or value, show less than half the picture.

To judge what progress in the standard of living is possible for the miner one must know, not how much coal he produces, but how much his output will exchange for—what is its real value in terms of other articles, at one time and another. For Great Britain this is shown in the following table:—

Table 14.
REAL VALUE OF MINER'S YEARLY OUTPUT IN
GREAT BRITAIN.

<i>Annual</i> <i>Average.</i>	<i>Yearly</i> <i>Output</i> <i>per head.</i>	<i>Statist</i> <i>Nominal</i> <i>Value at</i> <i>prices of</i> <i>the day.</i>	<i>Index of</i> <i>Wholesale</i> <i>Prices</i>	<i>Value</i> <i>at prices of</i> <i>1909-13.</i>
1879-83	319	95	105	91
1884-88	319	81	88	91
1889-93	282	104	88	118
1894-98	287	88	78	114
1899-03	289	126	87	144
1904-08	283	112	90	125
1909-13	257	112	100	112
1914-18	252	189	173	109
1919-23	195	239	217	110
<i>Year.</i>				
1913	260	132	106	125
1924	220	208	173	120
1925 (provisional)	217	178	169	106

The table repeats in the first column the figures of output already given. The second column gives the money value of this output at the prices of the day; it is obtained by dividing the recorded value of the coal raised by the number of persons employed, and is affected, therefore, by changes not only in the output but in prices. The third column shows the course of money prices, as recorded by the *Statist* index of wholesale prices of commodities generally; it reflects changes in the purchasing power of money. The fourth column is got by dividing the figures in the second column by those in the third and multiplying by 100. The effect of changes in the general value of money are thus eliminated and the value of the output is shown at the prices of 1909-13. The resulting figures show the real value, that is to say the purchasing power of the average miner's yearly output, measured throughout at the prices of 1909-13. The same figures are set out graphically in the lower portion of the chart already mentioned.

The course of the figures is significant. From £91 in 1879-83 they rise to £145 in 1899-03, a climax of unexampled prosperity in the coal trade. In 1904-08 they fall, though they are still higher than in any other period, and in 1909-13 they fall further. For the single year 1913 itself the value is high again, £125. The war figures may be disregarded. In 1924 the value is £120, or lower than in 1913; in 1925 it is down to £106, lower not only than 1913, but than the average of the five years 1909-13 together.

From material printed in the Appendix volume similar figures might be prepared for other countries. Uncertainty as to the full comparability of the values set on coal in different countries makes it unwise to lay too much stress on such comparisons, without fuller inquiry than has been possible in the time at our disposal. It may safely be said, however, that all the European countries, but most of all Germany, show a greater progress in the real value of each miner's output, continued as a rule right up to the war, than can be claimed for Great Britain.

Comparison of 1913 and 1925.

However that may be, the broad lesson of the British figures is sharp and clear. To the British coal industry the rising price of coal relatively to other articles more than compensated for declining output up to the opening of the nineteenth century, but the peak was then reached and each succeeding quinquennium to the war has witnessed a decline. The last two figures in the British table—for 1924 and 1925, the latter based on the first ten months—bring out the difficulty of maintaining in those years a pre-war standard of living for the miner. The real value of his year's work in 1925—what it can fetch in exchange for other articles—is well below not only the value in 1913 but also the average of the five years 1909-13. Within the limits of what his year's work will fetch the British miner has to live. This is

only another presentation of what Mr. Gowers put to us in evidence at the opening of our inquiry—that now seven men are endeavouring to live in mining, off the same total output as six had before the war, and are claiming to live as well. They can do so only if the price of coal has risen at least one-sixth more than that of other articles, and it has not done so. This is an account that no good will and no fine words can balance; the gap must be filled in one of three ways: by a marked rise of coal prices, by better organisation leading to greater output, or by acceptance of a lower standard of living. The first is an event improbable in itself, to the extent required, at any early date, and one on which we cannot count, for certain, at any date. The second is an achievement for which we may hope, but it must come slowly. The last is a price that may have to be paid, in wages or hours or unemployment.

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CHAPTER XII.—WAGES.

1. THE EXISTING SYSTEM OF WAGE REGULATION.

The immediate dispute which led to the appointment of this Commission was a dispute about wages. We have felt bound accordingly to deal with this important subject at some length, and to indicate our views on many points connected with it. But we are bound also to make clear our opinion that the responsibility for framing wage agreements cannot be taken either by ourselves or by any body outside the industry. Ultimately this responsibility must rest upon those directly concerned in conducting the industry, that is to say, the representatives of the wage-earners on the one hand and the representatives of the wage-payers on the other. These two parties may agree to associate with themselves, in a permanent National Wages Board, such as we suggest below for certain purposes, impartial persons from outside. We, as a temporary Commission wholly outside the industry, cannot make a new wage agreement for it. We can only indicate, for the assistance of those who will have to make such an agreement, the lines on which it seems to us that the agreement should be framed, and the points that should be borne in mind if the industry is once more to be stable and prosperous.

At the outset, it is necessary to describe the means by which wages have been regulated hitherto.

Into the determination of the wages of every miner there enter always two elements—the basis rate and the percentage addition thereto. Thus the wages paid to a Durham hewer during May, 1924, would be his basis rate, plus a percentage addition of 128·67. There may also enter one or more of four or five distinct types of minimum wage prescriptions. Thus the wage of a collier's helper in South Wales during October, 1925, would be basis rate, plus the minimum percentage under clause 5 of the wage agreement of 1924, plus an addition under clause 6 to bring him up to 40 per cent. above standard wages of the lowest paid class of day-wage workman, plus a subsistence allowance under clause 7.

The basis rate is fixed on the spot for the particular work which that particular miner has to do; it may be a piece rate or a day rate; it varies, not only according to the worker's grade, but from pit to pit, or from seam to seam, or even from one part of a seam to another, according to varying physical conditions; it is adjusted, as conditions change or machinery or new methods of mining are introduced, but otherwise, once fixed, remains as a rule with little or no change from year to year. The basis rate itself, particularly for a hewer, is often a complex affair, built up of separate allowances for all the different items of work that he may be required to do, but for present purposes these complications may be disregarded. The essential function of the

basis rate, varying from place to place, is to allow for the differences between different kinds of work and workers at any given time.

The percentage on basis rates is determined and always has been determined, not locally for particular mines, but for large areas—for a county like Northumberland or Durham, or a coal-field like South Wales and Monmouth, or a country like Scotland. It varies, not from place to place within the area, but from time to time; its function is to allow for changes in the economic condition of the industry or large sections of it, in the value of money, and in the standard of living of the miners.

The actual areas over which uniform percentages have been determined have varied from one time to another, and so has the method of determination. Directly or indirectly, the percentage addition is a means of making workpeople, as well as employers, share in the prosperity or adversity of the industry. The problem has been that of arriving at an objective test of prosperity or adversity, so as to avoid blind bargaining and trials of strength.

In the last quarter of the 19th century, percentages in the various districts were commonly determined automatically by reference to the selling price of some standard quality of coal, taken either at the pithead or at the port of exportation. These automatic sliding scales based on prices met with a good deal of objection—mainly from the men—and were gradually abandoned in favour of conciliation boards, which, as a rule, left the final decision, if the parties failed to agree, to an impartial chairman. The conciliation boards and the chairman habitually had regard to facts such as prices, which had governed the former sliding scales, but they were not formally bound by them. A peculiar and on the whole valuable feature of this procedure was that the chairman was bound, as a rule, to decide either for the employers' proposal or for the men's proposal. He could not compromise between them or make a fresh proposal himself; this gave each side a motive for putting forward serious and moderate demands which had some chance of acceptance, instead of asking for twice what they hoped to get.

The Agreements of 1921 and 1924.

The national wage agreement of 1921, following on de-control of the mines and the three months stoppage of that year, is a new and striking attempt to get back to an automatic determination of wages by reference to ascertained facts. The old sliding scales, based on selling prices only, were open to obvious criticism; selling prices are an inadequate test of economic conditions, in so far as they do not allow for changes either in the costs of production or in the volume of trade. The 1921 agreement provided accordingly for the ascertainment, district by district, of the actual gross proceeds of the industry in a given period, *i.e.*, the money received on the sale of coal, and of the costs of production other than wages; of the difference between these two sums, described as net proceeds, a certain proportion was to

be treated as representing the share of labour ; the percentage addition to basis rates for the following period was then to be fixed as that which would just have given this share to wages in the period of ascertainment. For the purposes of the ascertainment, the country was divided into 13 wage agreement districts. One of these—the Eastern Division, including Yorkshire and most of the Midlands—now produces a third of the total output of the country ; five others—Scotland, Northumberland, Durham, Lancashire Cheshire and North Staffs, and South Wales and Monmouth—are each of substantial size ; the remaining seven—Cumberland, North Wales, South Staffs and Salop, Bristol, Forest of Dean, Somerset, and Kent—produce between them less than any one of the others, and only 4 per cent. of the output of the country.

The principles of this agreement were continued without change in the new agreement which replaced it in May, 1924. The determination of wages under both was automatic, and left, it was hoped, no room for uncertainty or disputes. The principal change affecting the wage ascertainment was an increase of labour's share of the net proceeds from about 85 per cent. to about 87 per cent.

Both the 1921 and 1924 agreements, however, contained very important provisions, other than those for determining the fluctuating addition to basis rates in accord with the economic conditions of the time and district. Each embodied in more than one way the principle of a minimum wage.

First, the 1921 agreement provided that, whatever the result of the ascertainment, in no district should wages be paid at rates less than 20 per cent. above the "standard" ; that is to say, above a level approximately equal to the rates in force in 1914. The 1924 agreement substituted 33½ for 20 ; that is to say, it raised the minimum wage for all classes of labour by 11 per cent. (as from 120 to 133½). For reasons which need not be detailed here, the actual increase of earnings per shift from 1914 to the present time, as it is given later in this chapter, is greater than the minimum percentage, even when districts are "on the minimum."

Second, the 1921 agreement provided that when the rate of wages as duly determined in any district did not yield a subsistence wage to low-paid day wage workers, additions should be made thereto in the form of an additional allowance per shift. The scale of allowances was to be determined by district boards or, on failure to agree, by an independent chairman. The 1924 agreement increased these allowances. Broadly, this provision, which is now applied in nearly all districts, secures that the lowest paid adult man obtains in all the principal districts a minimum daily wage ranging from 7s. 6d. in Lancashire, Northumberland, and Durham, to just over 8s. in South Wales and 8s. 9d. in South Yorkshire. In one small district (Bristol) the subsistence wage is paid only to heads of families, and in another (Kent) it varies with the number of children.

In addition to these two provisions—both of importance—there is a third, under clause 6 of the 1924 agreement, affecting a few special classes of men. There are also minimum day wages fixed for hewers and others normally employed on piecework; these wages apply both during development before piece-rates have been fixed, and when the workman is engaged in a difficult place where it would be impossible for him to earn a reasonable wage at piece-rates. There is, finally, yet a fifth kind of minimum wage in existence, depending on the Coal Mines Minimum Wage Act of 1912; the rates prescribed under this Act have been replaced, in most districts, by higher rates fixed by agreement.

The Minimum Wage and the Economic Wage.

These rather complicated arrangements embody two main principles—that of a minimum wage and that of an economic wage to be determined scientifically. The minimum wage is something that must be paid irrespective of the economic conditions of the industry for the time being, that is to say whether the industry for the time being can afford it or not; it represents either the assumed bare needs for subsistence or some standard of living which, having once been won, should not in the view of the men be abandoned, even at the cost of reducing the scale of the industry and the numbers that can be employed. The economic wage is something to be determined from time to time, according to the economic conditions of the industry as a whole or in any particular district.

In mining, with its violent fluctuations of prosperity and prices and the large proportion formed by wages in the total costs of production, the economic wage must also be fluctuating. The outstanding merit of the 1921 agreement, when it first was made, appeared to be that it based the economic wage firmly on facts to be impartially and exhaustively ascertained, and made the wage in form, what it is in substance, a sharing of the proceeds of the industry. The mine-owners, who were mainly responsible for suggesting the form of the agreement, deserve every credit for their readiness to make this new departure, and to open their books for impartial examination.

The agreement of 1921 was hailed, not only in this country, but by expert observers overseas, such as the United States Coal Commission, as a landmark in progress to better relations between employers and employed. "The common interest in continuous and successful operation finds a concrete expression in the present British wage agreement, which provides that miners and owners shall share the profits of the business in defined proportions, the profits being figured not on a single mine but on the whole district. The plan is equitable and would probably have won even more enthusiastic support in a more prosperous period than the past two years have been in the British coal trade, and after a longer trial this form of adjusting wages to results may prove to bring

about the highly desirable full co-operation of employer and employee in seeking efficiency."*

It is important to examine fully the reasons why the agreement has not altogether fulfilled expectations. This examination falls naturally into three sections, concerned respectively with the Wage Ascertainment and its Difficulties, with the Minimum Wage, and with the Machinery of Wage Regulation.

2. THE WAGE ASCERTAINMENT AND ITS DIFFICULTIES.

Inter-locking of Industries.

The first difficulties to be noted, and those that bulk most largely in the miners' criticism, are the difficulties of defining the industry and determining its gross proceeds. The business of coal mining, that is to say, bringing coal from the seam to the surface and preparing it there for sale, by screening or washing, is not carried on in isolation from other businesses. There is a strong and, on the whole, a growing tendency for mining to be associated on the side of capital with businesses engaged in the utilisation of coal—in particular, the making of metallurgical coke and by-products—or in the marketing of coal, whether for inland sale or export, or in work ancillary to mining, such as the building or operation of coal wagons or the supply of timber and other mining materials.

The extent to which collieries are associated with other businesses may be indicated in various ways. Sir Josiah Stamp informed us that collieries so completely absorbed by other concerns that for income tax purposes they were not described as mining businesses at all, produced in 1914 12 per cent. of the total output of coal in the country; he thought it probable that this kind of integration had increased since the war.† Lord Gainford, on behalf of the National Association of Coke and Bye-Product Plant Owners, furnished a table showing that of all the metallurgical coke produced in the country, 41 per cent. came from ovens owned, directly or indirectly, by colliery companies not connected with iron and steel firms, and 38 per cent. from ovens owned by colliery companies and iron and steel firms combined; another 7 per cent. came from ovens owned by iron and steel firms not connected with collieries; only 14 per cent. of the industry, in terms of output, was wholly independent.‡ Sir William Larke gave slightly different figures of the same nature.§ Finally, a return obtained by us directly from the colliery undertakings showed that, in 1924, 23 per cent. of all the coal disposed of went to associated concerns, including selling agencies, in which the undertaking or its directors had substantial financial interests.** This figure is curiously near the rough

* Final Report of United States Coal Commission of 1922-23, p. 274.

† Stamp, para. 5.

‡ Gainford, para. 6.

§ Larke, Q. 1058.

** Table 9, Appendix No. 18.

estimate made by Sir Josiah Stamp in giving evidence, of 20 per cent. as the probable maximum of the coal passing under associated conditions. The proportion varies considerably from one district to another ; it is highest in South Wales (38 per cent.) and South Yorkshire (37 per cent.), and is trifling in Northumberland.

The close association of coal mining with other businesses is not peculiar to Great Britain. In the United States "captive mines," that is to say, those owned directly or indirectly by concerns in other industries, are estimated to produce 20 to 25 per cent. of the total output.* In the Ruhr the "mixed mines," that is to say, those owned by or associated with other types of undertaking, have 60 per cent. of the potential output, and about one quarter of this 60 per cent. is actually consumed by the mines or the associated undertakings.

Nor is there any reason to doubt that this association is on the whole favourable to the efficiency both of the mine and of the allied concern. It does, however, having regard to the existing agreement, under which wages are governed by the net proceeds of the industry, give rise to two very difficult problems—that of defining the scope of the industry and that of determining fairly its proceeds.

Coke Ovens and Selling Agencies.

From one point of view, these other businesses, no less than the colliery undertakings themselves, may appear to be making profits out of coal, by carbonising it, selling it, transporting it. The Miners' Federation urge that the proceeds of these businesses should be brought into account for the wage ascertainment. The argument is put forward most strongly in relation to the coke and by-product plants ; these, it is said, should be treated as part of the mining industry. Against that the employers urge that coking is an absolutely distinct industry, with its own finance and wage arrangements. The point has already been considered by Sir William Plender as independent chairman for the interpretation of the 1921 agreement, and it has been ruled by him that the only proceeds to be taken into account are those of coal mining proper ; coking and by-product businesses are excluded. This appears to us to be a right decision.

The objection to the inclusion of coking with mining is not exactly that the former is a separate industry ; four-fifths of it is carried on by companies concerned in coal mining. The real difficulties lie in other directions. In the first place, coking is only a little less closely bound up with the iron and steel trades, than it is with mining. Of the four-fifths of the coking industry associated with coal mining, nearly half is associated with iron and steel works as well, while there is a substantial number of coking plants at iron and steel works having no association

* Report of United States Coal Commission, p. 211.

with collieries at all. In the second place, the conditions of mining and of coking differ fundamentally in respect of the proportion that wages bear to the total costs of production; any direct inclusion of coking labour with mining, at the same ratio of division of net proceeds, would be manifestly absurd.

The line at present drawn between mining and coking is right. In another direction, that of selling agencies connected with collieries, it appears to us that the existing boundaries of the mining industry ought to be extended, that is to say, the profits of such agencies should, in general, be included as proceeds in the ascertainment. To this point reference has already been made in dealing with Distribution.

Transfer Prices.

Wherever the boundary of the mining industry be drawn, the problem of transfer prices arises. The proceeds of the industry are to determine the wages; the proceeds depend mainly upon the quantity of coal sold and the price at which it is sold. Where the mineowner disposes of coal to an independent concern—whether for coking or consumption or inland sale or export—he naturally tries to get the highest possible price for it. Where he disposes of it, not to an independent concern, but to another department of the same business, the price has often to be determined more or less arbitrarily as a “transfer price.” Where he disposes of it to a selling agency or other trading or industrial undertaking which, though nominally separate, is closely connected with his colliery undertaking by holding of shares or interlocking financial interests, his normal motive for securing as high a price as possible for the coal as it leaves the colliery is weakened, or may disappear altogether; he can make up later all that he foregoes on coal. The Miners’ Federation urge that in such cases there is not sufficient security that the price entered for coal in the wage ascertainment will be a fair one; they fear that miners’ wages will be lowered.

As a safeguard for the just determination both of proceeds and of costs, the wage agreement provides that two firms of accountants, appointed by the mineowners and the miners respectively, but acting jointly, shall prepare the ascertainment figures for each district; for the purpose they are allowed to examine the colliery books. Leading representatives of two of those firms, who act also as independent advisory accountants to the National Board for the wage agreement, appeared before us as witnesses; we were impressed both by the thoroughness of their methods and by the spirit of fairness in which they approached their task. It is no reflection either on the fair dealing of the mineowners as a body, or upon the impartiality and efficiency of the joint accountants, if we think that a radical change in the treatment of transfer prices is needed to place the wage ascertainment beyond suspicion.

It is necessary, in the first instance, to refer briefly to certain

figures, supplied at our request by Lord Gainford on behalf of the National Association of Coke Oven and Bye-Product Plant Owners. These figures with explanatory notes are set out in Section 6 of the Annex at the end of this Report. They compare the prices paid for coal in 1913 and in 1925 by coke ovens, distinguishing those which are independent and those which are associated with collieries alone, with iron and steel works alone, and with collieries and iron and steel works in combination.

As is pointed out in the Annex, the greatest caution should be exercised in drawing conclusions from the figures there set out. It is not too much to say that no definite conclusion can be drawn from them that disposal of coal under associated conditions depresses on the whole the price obtained. On the other hand, the indication that this may happen is sufficiently strong to make it impossible for us, as the result of our inquiry, to give the miners the assurance that it does not and cannot happen. Without assurance on this point, the wage agreement cannot secure the object for which it was devised, of promoting good relations and settling wages without disputes.

We obtained, also directly from the colliery undertakings, returns giving the quantities sold and the proceeds on independent sales and on disposals to undertakings and agencies of various kinds associated with them. Tables based on this return are printed in the Appendix volume*. As it is impossible, however, to distinguish in them between different qualities of coal which vary widely in price, no inference can fairly be drawn from them as to transfer prices.

In our view, however, general considerations here are more decisive than any statistical results. There is no reason for suspecting anything that can justly be described as deliberately unfair dealing in this matter. The direct gain to any individual employer in lowered wages is too small to be a serious temptation, as wages are determined by the district results and not by those of single collieries; the individual proceeds of each mine are ordinarily only a trifling fraction of all that goes into the wage ascertainment of the district. In any case, anything like fraud would very soon be detected by the accountants. The difficulty is simply that there are many points in the fixing of transfer prices as to which genuine doubt is possible—such as the precise quality of coal, or the proper division of the economies of geographical situation and regular contracts—and that, in the solution of these doubts, the mineowner selling under associated conditions has no particular interest in securing the highest possible price for coal as it leaves the colliery, since he can make up later on, while he has some motive for giving the benefit of any doubt against the colliery. With associated conditions governing the sale of more than a third of the total output in certain districts, it can make a very sensible difference to net proceeds and so to the rate of wages, if all employers incline to prefer profits at the later to profits at the earlier stage.

*Appendix No. 18 (Table 9).

It is sometimes argued that a colliery, in view of its assured market, may reasonably take a lower price from an associated undertaking. We doubt if this argument is admissible. Mr. Evan Williams agreed in evidence to the suggestion that a business buying coal ought not to get it more cheaply from an associated than from an independent colliery; this means that the colliery should reap the economies, if any, of direct association with its customers. Mr. Williams further assured us, and we unhesitatingly accept his assurance, that the desire of the Mining Association is that the benefit of any doubt should be given in favour of the miners' wages and not against them.*

It is sometimes argued, again, that a colliery may at times fairly use an associated concern as a means of disposing, at something below nominal market price, of a temporary surplus of coal which, if placed on the open market, would break prices altogether. There is some validity in the argument. The difficulty is that if once the principle is admitted of allowing, for any reason, a lower price on an associated than on an independent sale, it becomes almost impossible to discover or prevent abuses.

The joint accountants, in fact, quite frequently raise transfer prices as entered by individual mineowners. This is testimony both to their efficiency and impartiality, and to the tendency to depression of prices against which they have to work.

Proposals for Reform.

As a result of full consideration, we are not certain that any examination of colliery books by accountants, after the prices have been entered by the mineowners, can absolutely counteract this probable tendency to depression of coal prices through selling under associated conditions. We are quite certain that it will not be possible, without some modification of the present system, to convince the miners that their interests are fully protected, and thus to secure that confidence in the wage agreement which is essential to good feeling. The representatives of the Mining Association were at one with the representatives of the men and with ourselves, in wishing both to secure that the agreement is carried out with absolute fairness and to take any reasonable steps for convincing the men that this was being done. They objected to the proposal of the Miners' Federation that, for this purpose, representatives of the Federation itself or of the men at each colliery should be allowed to examine the individual colliery books. There are various objections to enforcing this degree of publicity upon the working of colliery concerns. Nor would it be likely to serve the purpose in view; working miners are seldom at the same time expert accountants. We think the solution must be sought elsewhere, and have considered in particular two suggestions.

The first is that the accountants should be given facilities for examining the books, not only of the colliery undertakings

* Evan Williams, Q.16013.

themselves, but of all concerns associated with such undertakings, including not only such businesses as coke ovens and brick works, but selling agencies, wagon businesses, and other trading and industrial concerns. By this means they would be in a position to see the other side of the shield, and to compare not only the prices obtained by each colliery from its different classes of customers, but the prices paid by each purchaser of coal to his different classes of suppliers. The representatives, both of the mineowners and of the coke and by-product plant owners, were disposed to consider this suggestion favourably.

We cordially recognise their anxiety to find a solution to the difficulty. We fear, however, that this suggestion is open to objections, and in any case would not go far enough. It might involve investigation of businesses of every kind, over many of which the Mining Association would have no influence, and it could not be carried through without statutory rights to enforce disclosure. At the end it would still leave the prices to be fixed in the first instance by the individual mineowners.

We are inclined to think that the only real solution of the difficulty is to leave out of account the transfer prices which the individual employer may enter in his books, and to declare officially and publicly from time to time, through some impartial authority in each district, what shall be taken as the market price at that period of every kind of coal sold in the district. The proceeds of each colliery would then be determined automatically by the quantities of coal of each kind produced by it; it might even be possible and useful for these quantities to be made known to the pit committees, the establishment of which is proposed later.

This process would be very similar to that by which for many centuries the prices of grain and of many other articles have been ascertained in Europe, in order to determine rent or tithes. With coal the matter is naturally more difficult, owing to the great variety of kinds of coal, but we cannot think that the making of a sufficiently detailed list in each district would prove an insoluble task. The present system assumes that it is possible for the accountants to say what is a fair price for every kind of coal that is sold in the district, since they have to pass as correct the prices entered by the employer.

We recommend accordingly for the consideration of the Mining Association and the Miners' Federation that in any new wage agreement provision should be made for determining the proceeds of coal sold under associated conditions on the lines just indicated. If this proposal and all variants of it alike prove unworkable, it may be necessary reluctantly to decide that automatic determination of the economic conditions of the industry, even with access to all the employers' books, is impossible, and that a return must be made to conciliation boards, using human judgment upon the facts submitted.

District Wages and Individual Profits.

A second set of difficulties arises from the fact that while wages are settled by districts, the profits are those of individual mines. Each undertaking stands on its own bottom. The unsuccessful mine has its wage rate raised slightly by the success of others; the fortunate or well-managed mine in a poor district pays lower wages in accord with the scale of the district, and keeps its own large resulting profits.

Within limits, this is inevitable and desirable. Workmen's wages could not vary from mine to mine in full proportion to its success or failure. The independence of each colliery undertaking, giving it the rewards of success and the penalties of failure, is a stimulus to efficiency. But the arrangement has harmful reactions.

First, the workman has no direct financial interest in the success of the undertaking in which he is employed. Its net proceeds, large or small, positive or negative, are lost in the district ascertainment.

Second, the workman sees particular mines making large profits, though wages are low or falling; he feels that often they are doing so, not simply or mainly, as in other industries, through greater efficiency, but through good luck in finding easy physical conditions.

The Miners' Federation submitted in evidence a table of bonus shares issued since 1912 by 34 companies engaged in mining and other business, and amounting to over £17,000,000, out of a total capital in those companies of £45,000,000. Some of this was due to businesses other than mining; little or none of it, so far as we could ascertain, could be described as watering of capital. For the most part, the companies concerned had left accumulated savings in the business, and were now bringing their nominal capital into accord with facts, by issuing additional shares as a bonus to the shareholders. We refer to the table only to suggest that it would probably have been, from every point of view, an excellent allocation of resources had the companies issued some of those bonus shares, not to the shareholders, but to the workmen.

Shares for Workmen.

In many other industries, individual firms have arrangements for distributing part of any profits made above a certain standard to their employees, either as additions to wages or as employees' bonus shares.

We suggest that by suitable legislation colliery undertakings generally should be required, within a stated period, to adopt schemes providing that of all profits hereafter distributed above a standard dividend on the existing capital, whether the distribution to ordinary shareholders took the form of extra dividend or of bonus shares, a fixed proportion should be reserved as shares to be issued to employees, having regard to the service rendered by them.

The schemes could and should vary with the circumstances of particular undertakings, including the character of their capitalisation, though a general model might be issued for their guidance. Approval of each scheme by a central authority would be necessary ; provisions would be needed to secure that subsequent sales or reconstructions of undertakings did not lead to termination of the schemes or inflation of capital to the disadvantage of the workmen.

Under this suggestion, the employees will benefit by the prosperity of the mine where they work, not by an addition to wages, but by obtaining a share in the capital. This is desirable, partly because any possible addition to wages through sharing distributable profits would necessarily be small and often temporary, and partly because the object is to give the workman a permanent interest in the undertaking. It should be made clear, however, that the workman who had received shares would not lose them by leaving the mine ; he should be assured of being able either to hold them or to get full value for them.

We are aware of the suspicion with which any form of profit-sharing is regarded by many who have the interests of labour most warmly at heart. They feel that attachment to one particular undertaking may weaken the workman's allegiance to his trade union ; they fear that conditions applied to the sharing of profits or holding of shares may be used to punish men who strike ; they dislike making the workman's remuneration depend on the efficiency or good fortune of his employer, so that one has more than his neighbour doing the same kind of work, or so that the same workman has now more, now less. As to the first point, it may be suggested that the Miners' Federation is sufficiently strong to take this risk ; trade unionism in mining rests upon a natural solidarity of feeling which needs no buttressing. As to the second point, the bonus shares would be issued in accordance with an approved scheme and once issued should become the property of the workman receiving them, and the share or its market value would be assured to him in all circumstances. As to the third point, the overwhelmingly large part that wages play in the economics of mining, make it certain that any sums distributable as profits to workmen would always be small in relation to their income as wages ; it is for that, amongst other reasons, that we suggest a sharing of profits by issue of shares, rather than by fluctuating additions to wages. The amount going to any one man would in a successful colliery be sufficient to make him feel a direct and permanent interest in its success and would provide him with a reserve for emergencies ; it could never make his standard of living very different from that of his neighbours ; it would make less difference than is now made every day in the year by variations of the seams on which the miners work.

The case may be summed up thus : Unless wages are fixed colliery by colliery—an impossible as well as a most mischievous proposal—the better or luckier collieries in each wage district

are bound to earn large profits. These cannot be used to make up the profits or wages of neighbouring collieries under a pooling system, without the certainty of encouraging and perpetuating inefficiency at the expense of efficiency. To leave them to go, as at present, wholly to the shareholders, is the main cause of that resentment which appeared in so much of the evidence given to us on behalf of the Miners' Federation. To secure that part of these special profits shall go in every case to the workman is fair—because the workman helped to make those profits; it is expedient—because it gives the workman a real interest in the success of the undertaking.

Small Mines and the Ascertainment.

The difficulty due to wages going by districts and profits by mines has another aspect and leads to a further suggestion. The existence of the less successful mines in a district, by lowering net proceeds, lowers wage rates and so increases the profits of the more successful mines in that district. For a number of reasons it is well worthy of consideration whether there should not be some exclusion from the wage ascertainment of those classes of mines which, as a whole, are unsuccessful; this means that they would have to pay the district wages, but that their working results would not be taken into account in fixing the wages. The wage rate for the district should be set by the most efficient employers in it, not be depressed by the less efficient. The result might be to hasten a little, as it is desirable to hasten, the closing of uneconomic mines. It would no doubt be a difficult matter to pick and choose between mines and exclude directly on the ground of inefficiency; the best managed mines make a loss at times through special circumstances. A simple exclusion by size—say of all the 300 undertakings having an output of less than 200,000 tons a year—would serve all practical purposes, and would greatly diminish the labour and cost of making the ascertainment.

Fluctuation of Wages.

A third objection to the simple division of net proceeds in the same fixed ratio each year between capital and labour is that it may make wages excessively fluctuating. This appears from the interesting evidence laid before us by Sir Josiah Stamp, who was consulted by the Mining Association when framing their proposals for the 1921 agreement, and furnished them with statistics showing the proportions in which the net proceeds had been divided between capital and labour before the war. On the average of 20 years—from 1894 to 1913—profits were 17·3 per cent. of wages—a proportion practically corresponding to the division adopted under the 1921 agreement under which from £100 of net proceeds, about £85 went to labour and £15 to capital. Individual years, however, varied very greatly from the average, the proportion of profits to wages being as low as 6 per cent. in one year, and as high as 42 per cent. in another. Wages before the

war, in coal mining as in other industries, fluctuated on the whole materially less than profits. In a year of bad trade profits were relatively small, or even non-existent, and this was made good in a year of busy trade, when profits would rise much more than wages.

It is recognised as one of the functions of capital in all industries that it should bear most of the risks and take most of the advantages of trade fluctuation. There is good reason for this. To divide the net proceeds, in good years and in bad years alike, in the same ratio between capital and labour, although on an average of years it may distribute the proceeds fairly, is undesirable, because it makes wages more fluctuating, in order to make profits less fluctuating, than would otherwise be the case. This was clearly set out in a chart submitted by Sir Josiah Stamp, showing what profits and wages had actually been in the 20 years before the war, and what they would have been if the 1921 agreement, apart from its provisions for a minimum wage, had then been in force.* There can be no doubt that great fluctuation of wages is in itself an evil; if wages fall beyond a certain point they will be below subsistence level; in a boom they may rise so high as to set up a standard which it is impossible to maintain for the future, but which the workmen will often endeavour to maintain at all costs. The most obvious corrective to excessive fluctuation is that contained in the 1921 and 1924 agreements—namely, the provision of a minimum below which wages may not fall, coupled with the further provision that any extra expenditure incurred by the employers in paying wages at the minimum rather than at the economic rate in bad years should be recovered by them from the profits of subsequent good years.

In one respect, however, the arrangements under the 1921 and 1924 Agreements appear to us unsatisfactory—namely, that they provide for the employers recouping themselves immediately; that is to say, so soon as wages begin to rise above the minimum again at all. They thus postpone unduly the workmen's share in returning prosperity; later they may give him suddenly the full benefits of the boom at its height. It appears to us that the arrangements should be such as to postpone, until trade is near the climax of its prosperity, the recoupment by employers of excess payments to labour during bad years. This could be secured by providing that recoupment should only be made when wages had risen to a certain level above the minimum. This is better in principle than the step towards postponing recoupments which was taken in the 1924 agreement, in limiting the amount that might be used for recoupment to one-third of the available surplus. Actually, it may be noted, the recoupment provisions have never operated effectively.

The considerations here put forward are an additional reason for maintaining an effective minimum wage. Subject to its

* Appendix No. 6.

maintenance and to the slight alteration suggested above in the method of recoupment, we are inclined to think that the fluctuation of wages may be reduced within reasonable limits. If, however, this fluctuation still seemed excessive, or if the principle of recoupment were thought objectionable, there would remain for consideration the alternative plan suggested by Sir Josiah Stamp, of varying the ratio of division between capital and labour, so as to give labour a larger share in times of depression, and a smaller one in times of prosperity.

Minor Points in Wage Ascertainment.

There remain for brief reference a few minor points in connection with the wage ascertainment.

First, expenditure on subsistence allowances under Clause 7 of the 1924 Agreement, and on special allowances under Clause 6 is at present treated, not as wages, but as part of the costs other than wages. The mineowners, last July, proposed that such expenditure should be treated as wages. This seems to be right in principle.

Second, the mineowners point out that profits under the wage agreement are not net, since they have to cover debenture interest and amortisation charges, together amounting, on an average, to something like 3d. a ton. We are inclined to think that amortisation charges might be made the subject of further reference to the independent chairman, but that the decision already given by him, excluding debenture interest from costs should stand. If this were included as a cost of production, anomalies would arise between undertakings obtaining their capital wholly by shares and those having recourse to debentures.

Third, the treatment of directors' fees, now reckoned as costs may be worth further consideration. Their amount is negligible—less than $\frac{1}{4}$ d. per ton—and logically they are part of costs rather than of profits. To treat them as profits, however, would disarm a great deal of criticism.

Fourth, various criticisms were made to us by the Miners' Federation as to the allocation of costs between capital account and working account, and as to allocation of labour services and costs between the different parts of a joint undertaking, *e.g.*, a colliery and a coke oven. These are points which the joint accountants might be left to deal with.

In addition to the points mentioned above in relation to the wage ascertainment, there are certain changes in methods of remuneration which we regard as desirable. These are, first, the giving of some interest in output to the large and growing body of persons employed in coal mining who are now remunerated by time and not by piece; second, the provision in all districts, as it exists in some districts, of machinery commanding the ready assent of both parties for adjusting piece rates on the introduction of machinery or new methods of working; third, the putting of

some premium on regular attendance, either, if this is possible, by giving a guarantee of regular work on condition of such attendance or by other privileges. Each of these points is dealt with more fully in that section of our report to which it is appropriate. Each is a question rather of basis rates than of percentage additions under the wage-ascertainment. For the sake of completeness, however, in our survey of wage problems, we enumerate them here.

3. THE MINIMUM WAGE.

Minimum Percentage and Subsistence Wage.

In discussing the Minimum Wage, it is necessary at the outset to recall that, even apart from the Minimum Wage Act of 1912, there are in practice two quite distinct types of minimum in force. There is, first, the subsistence wage, under clause 7 of the 1924 agreement, securing to the lowest paid adult worker a definite number of shillings per shift, ranging now in the principal districts from 7s. 6d. to 8s. 9d. There is, second, the minimum percentage under clause 5, securing to every worker from the highest paid to the lowest at least 33½ per cent. above the standard of 1914; this is intended to guarantee, not bare subsistence, but for each class of worker a certain standard of living, differentiated according to his skill or responsibility.

As to the subsistence wage, no serious problem arises, though we make some suggestions later as to the principles on which it should be determined; it affects in any case a small proportion of all the workpeople employed. The subsistence allowances are important to those who benefit by them, but represent a trifling fraction, less than 2 per cent., of the wage bill. The minimum percentage, on the other hand, raises fundamental issues both as to the finance and as to the management of the industry.

Formally, there is no difference of view between the mine-owners and the miners as to the need for establishing for all workers both an economic wage, to rise and fall with the economic conditions of the industry in each district, and a minimum wage which must naturally be defined by minimum percentages on basis rates, to be paid irrespective of the economic conditions of the industry. The men have accepted, in 1921 and again in 1924, the principle of sharing proceeds, as the method for determining an economic wage. The mineowners, though their proposals in July last appear at first sight to abolish any minimum percentage, and though the Government subsidy since August is being paid as though there were no minimum, have made it clear in evidence that they contemplated, not the abolition of all minimum percentages, but the fixing of minima by negotiation in each district. Formally, therefore, any difference as to the minimum percentage is narrowed down to a question as to the machinery for fixing it. Actually, there is a substantial underlying difference of standpoints between the two parties.

Inter-action of Prices and Wages.

The principle underlying the old sliding scales and the proceeds-sharing provisions of the existing wage agreement is that the prices obtainable for coal must ultimately determine wages. The industry and the men in it must adapt themselves to economic necessities, and be content to get a pint and no more out of a pint pot. This is the view that not unnaturally dominates the minds of the employers. The men, on the other hand, are impressed by the opposite truth, that wages have a great deal to do with determining prices. They see the powerful tendency, in an industry organised on highly competitive individualistic lines, for prices to fall to the lowest point consistent with the costs of production, and they realise, as fully as the employers, that wages are the main item in those costs. The lower the minimum wage that they are prepared to accept, the lower is the point to which costs of production and therefore prices can fall, and in their view will tend to fall; if they are content to ask for a pint as a minimum and to hope for more, a pint pot and no more is the pot that the employers will provide. They have before their eyes an impressive illustration of this to-day. The recovery of the export trade under subsidy, of which much has recently been heard, has been based upon acceptance by the mine-owners of prices which, without a subsidy and without a minimum, would have given the men in December 1925 money wages barely above the level of 1914, if not actually below it.

The economic wage, in the eyes of the men, tends to fall to the minimum wage. Their reaction is to take every chance of forcing up the minimum wage till it reaches or outdistances the economic wage. The 1924 agreement affords a crucial illustration. The occupation of the Ruhr, paralysing the largest continental coalfield, brought a fleeting prosperity to the British coal trade. In the spring of 1923 prices rose rapidly and, with a slight reaction, remained high till the end of the year; wages and profits rose also under the proceeds-sharing arrangement. The Miners' Federation thereupon gave notice to terminate the 1921 agreement, and secured as from May 1924 a new agreement, which, not merely altered the ratio for sharing proceeds, but put up the minimum from 120 to 133½ per cent. of standard wages. The new agreement took effect just as the temporary prosperity on which it was based came to an end. Lancashire and South Wales, with most of the smaller districts, were already on the minimum of 1921, that is to say, wages were governed by minimum percentage and not by sharing of proceeds. Within five months of May 1924 every district was on the new minimum except the Eastern Division, with the new South Yorkshire coalfield, and the insignificant Radstock area of Somerset. In July 1925 the Eastern Division fell into line; everywhere the minimum wage had taken the place of the economic wage.

In particular districts the position is yet more remarkable. Except during two months in 1921 and the last six months of 1923. South Wales has been on the minimum of one or other

agreement ever since the first agreement was made. The Lancashire, Cheshire and North Staffordshire district has been on the minimum continuously since June, 1922, and five of the smaller districts—North Wales, South Staffordshire and Salop, Bristol, Kent and Cumberland—have hardly ever been off it. Practically all that was new in the 1921 agreement has not operated at all, except in the Eastern Division and, during the paralysis of the Ruhr, in the exporting districts.

Re-establishment of Economic Wage.

The distinction between the economic wage and the minimum wage, which has thus been blurred in practice, is one which it is essential to re-establish and maintain. In many other industries the minimum wage prescribed from time to time by trade unions or by public authority habitually becomes the actual wage. In mining, with its exceptionally violent fluctuations of prosperity and prices, it is both possible and necessary to have a minimum, below which wages shall not fall even in the worst year and above which actual wages shall rise materially in average or good years. To force up the minimum wage in every boom to the highest level then reached simply brings widespread dislocation and unemployment the moment that the boom has passed.

On the other hand, in the present conditions of the industry, the dislike of the men for an economic wage determined by proceeds, is easy to understand. It is only another side of the difficulty already illustrated by the problem of transfer prices—the difficulty of an incomplete partnership. If the miner's wages are to be governed by the price obtained for coal, he ought to be satisfied that the mine-owner is doing everything possible to get the best price that the market will bear. He is not satisfied that this happens with transfer prices, and there are some grounds for his dissatisfaction; the remedy here, though not easy, is fairly plain. He is not satisfied that it happens in the general management of the industry when he sees every mine-owner competing with every other to lower prices in times of depression, not only at home but in the export trade, and to expand production in every boom without regard to the future. For this problem there is no clear-cut solution, if one rejects, as later we have given reasons for rejecting, the suppression of all competition, and the nationalisation of the industry.

If the economic wage, however, is to become a reality again, as we think it should, it is reasonable to suggest that the mine-owners here should turn their minds, as German mine-owners have done, to the possibility of making production and prices more stable than at present and, in the first instance, to the better organisation of the export trade.

Discussion of the minimum wage leads thus directly to larger problems of the general management of the industry, which must be dealt with in their proper place elsewhere. Here, starting with what is formally accepted by both parties, the problem is that of disentangling the economic wage from the minimum wage,

that is to say, of fixing the minimum wage at a point above which the economic wage can reasonably be expected to rise from time to time. This is partly a question of the principle on which the minimum should be fixed, and partly a question of its general level.

Mode of fixing Minimum Percentage.

As to the first point, it is natural and probably inevitable that the general minimum applying to all workers (as distinct from the subsistence wage) should be expressed in the form of a minimum percentage addition, whether to basis rates or to the wages of some standard period. In this way differentiation is made automatically between different grades of workers; skill and responsibility keep their reward. But the present system of applying one and the same uniform percentage in all districts to the wages ruling in a single year, chosen because a great war broke out in it and upset all subsequent price levels, is neither natural nor, in its results, satisfactory. The year 1914 was not typical, in respect either of wages in the industry as a whole or of the relative position of different districts. The exporting districts were still feeling the effects of the abnormal boom which culminated in 1913, so that their economic ability was relatively high; other districts may for similar special reasons have had a level of wages unduly low to be selected as a permanent basis. The minimum percentage ought now to be fixed for each district after a full survey of its past and of its prospects, with reference to a carefully selected permanent standard, and so as to secure a roughly comparable general level throughout. This does not mean that the minimum wage per shift or per week of each class of man should be identical in every district. Apart from the justice of taking into account varying privileges in respect of houses and coal, varying charges for tools or explosives, and other local differences in costs, when fixing money wages, it is reasonable to admit actual differences in real wages, *i.e.*, in the standard of comfort between different districts, as we have to admit them in other industries and in agriculture. Because the Forest of Dean cannot guarantee a standard of living absolutely up to the minimum thought necessary in Yorkshire, it does not follow that mining in the Forest of Dean should cease to exist. It is, however, essential, as we point out below, to secure, either by national negotiation or national approval of district negotiations, that the various district minima do not diverge too widely, and that there is no possibility of that cut-throat competition at the expense of wages which the Miners' Federation fear.

As to the second point, that is the general level to be aimed at in the minimum, the decision depends on two factors: a survey of the actual level of wages in mining, and an estimate of the future prospects of the industry. Only the first of these is in place in this chapter. The second is attempted in a later chapter, and recommendations as to the proper level of the minimum percentage in future must be postponed till that has been considered.

4. THE MACHINERY OF WAGE REGULATION.

Before examining the actual level of wages in mining, we have to deal with an important question of principle. This is the question of the form which wage agreements should take, and of the machinery for their negotiations. Till the coming of Government control in 1917, basis rates were arranged locally, as at present, and percentage additions thereto with or without a minimum were negotiated by districts; that is to say, through Conciliation Boards or similar machinery representing the employers and the workpeople in each coalfield or group of coalfields. The districts varied very much in size, from the small isolated fields of Somerset or Forest of Dean to the "federated area" covering the present Eastern Division, with Lancashire, Cheshire, North Wales, and Staffordshire as well; this area included not far short of half the total number of men employed. The separate miners' unions, however, had finally united to form the complete Miners' Federation in 1909, and the Federation, even before the war, adopted the policy of national agreements and cleared the ground for this in 1912 by instructing its constituent associations to make no district agreements beyond 1915. The outbreak of war and, later, the coming of Government control, postponed the issue, though a step to national negotiation was taken during control in 1920 in an agreement as to overtime. After de-control, the wage agreements of 1921 and 1924 were both negotiated on a national basis, between bodies representative of practically all the employers and all the workpeople in the industry.

The Mining Association put before us as one of their principal proposals a return to district wage agreements—

"It is the firm and unanimous conviction of those engaged in the management and control of colliery undertakings throughout the country that it is essential to discontinue the negotiations of wages between one body representing all the colliery employers on the one hand and one body representing all the colliery employees on the other hand, and while it is not practicable to regulate the general rise and fall of wages at each individual pit they are convinced that it is necessary to return to negotiating wages in individual districts."*

Mr. R. H. Tawney, on the other hand, appearing before us on behalf of the Miners' Federation, expressed the view that it was "absolutely vital, or at any rate of the highest importance, that the settlement of wage principles should be done by a national authority."†

Examination of the issue thus raised will be made easier by considering separately the three distinct items that now enter into wages and should continue to do so in future—the basis rate, the addition thereto whether by percentage or otherwise according to economic conditions, and the minimum.

* Evan Williams. Annex C, para. 65.

† Tawney, Q.17038.

Local Basis Rates.

The basis rate is and always has been the subject of local negotiation. In the case of piece-work, the rates for the various kinds of work performed are arranged between the management of each mine and the individual men concerned or their trade union representative; they may vary, as has been stated, from pit to pit, from seam to seam, and from one part of the same seam to another. In the case of day-wages, the rates, varying for different classes of work, are fairly uniform for all men of the same class in the same "district." In no case does the negotiating authority on basis rates, whether piece-work or day-wage, extend beyond a "district," and for this purpose a "district" means often something much smaller than a wage-agreement district; the Eastern Division, for instance, which is one for purposes of the wage ascertainment, includes at least nine separate "districts" for determination of basis rates. The function of the basis rate is to allow for differences in local conditions and methods of working and for changes in them, including the introduction of machinery or the substitution of piecework for timework. Such matters should be negotiated locally and settled finally at highest by district authorities. .

District Percentages.

The addition to basis rates, according to the economic conditions of the time, is also now calculated separately for each of thirteen wage agreement districts, though the principles to be followed are determined nationally; that is to say, it allows for the varying economic fortunes of the particular districts, and does not make employers in one district pay more, simply because those in another district are prospering.

There may be reasons for decreasing or increasing the number of districts or otherwise altering their arrangement; the present Eastern Division is certainly out of proportion to the rest. But the delimitation of districts must obviously itself be a matter of national agreement, and it is hard to see why the principles on which the economic ability of each district is to be determined from time to time should not be uniform or at least prescribed by national authorities. We found it difficult to obtain from the witnesses for the Mining Association specific instances of the manner in which the general principles of the wage agreement might with advantage be varied from district to district; their most definite suggestion was that the ratio in which net proceeds are divided between capital and labour ought to differ according to the extent to which coal-cutting machinery is used and the part played by capital in production thereby increased. It might be argued against this that allowance for the cost of machinery can be made, and is made most appropriately, in the adjustment of basis rates, so as to give both parties an advantage and thus an interest in its introduction. If this argument is rejected and

a differentiation of ratios for dividing proceeds is thought to be necessary, there is no reason why properly constituted national authorities of employers and workpeople, surveying the different districts, should not agree to make it. It would be perfectly possible for a central authority to fix one ratio of division for Scotland and another for Lancashire and Cheshire.

National Minimum.

We come last to the determination of the minimum percentage—the wage to be paid irrespective of the economic ability for the time being of the industry or the district. We do not see how such a wage, in a community so small and so closely united as Great Britain, can ultimately be fixed by other than national authorities. To give a free hand to each district to settle its own standard of living without consultation and without regard to any other, is to expose the standards of the more efficient and prosperous areas, on which the future of the country rests, to undermining by the weaker areas; it opens the door to “cut-throat competition between different districts at the expense of wages.”* We conclude accordingly that the minimum percentage for each district should be settled or at least approved by agreement between bodies representing all the employers and all the workpeople in the industry. This does not mean that the minimum percentage for each district may not with advantage be discussed in the first instance by district associations, if they think fit, provided that the minima thus provisionally agreed are afterwards submitted for approval by some national authority.

Subject to this preservation of a roughly, though not precisely, similar level of minimum remuneration to labour in different districts, and to the national settlement of the principles for determining the economic ability of each district for wages above the minimum, there is no reason to exclude all flexibility in applying the principles. If, for instance, the employers and workmen in any district agreed that part of labour's share of the proceeds of the industry should take the form of family allowances, and that the minimum and economic wages should be adjusted accordingly, there should be no objection to this course. At the present time houses and coal are provided, out of the proceeds of the industry, upon different terms and to different proportions of the workpeople from one district to another.

Example of other Industries.

This, however, is only an argument for flexibility in applying principles which in themselves should be general. The policy underlying the agreements of 1921 and 1924 is the national prescription both of the general level of minimum wages and of the principles for the determination of economic wages. The rightness and the necessity of that policy are in our view established.

* Tawney, Q. 17038.

The Ministry of Labour have supplied us with a list of 30 industries other than coal mining, each of which has some form of national organisation for conducting wage negotiations. They include, so far as we can see, every important body of wage-earners in the country. If the proposal of the Mining Association were accepted, the mining industry, in respect of wage negotiations, would stand alone, a solitary exception to the settled practice of every other industry that need be considered.

There remains only the question of the precise form of the national authority for prescribing wage principles. We have already indicated our view that this must be primarily a body representing the two parties in the industry, the mine-owners and the miners. If these parties, moreover, prefer that it should be composed solely of their representatives, their view must be accepted. Anything else can be based only on the free and cordial agreement of both parties. We do, however, suggest for the earnest consideration of mine-owners and miners, that the presence of a third impartial element, such as is found in the National Wages Board for the railway service, may prove of great value. Such a third party on the Wages Board would not form simply an occasional tribunal for contentious issues; they would have full opportunity of gaining through experience familiarity with the industry and all its underlying problems and difficulties. In the complicated negotiations that have in any case to be carried through between the mine-owners and the miners in the immediate future, the influence of a third party, chosen and trusted by both, could hardly but be helpful. The decisions of such a Board could not as such be binding, but we hope and believe that in practice they would be accepted by both sides.

5. THE PRESENT LEVEL OF MINING WAGES.

With the unimportant exception of the Radstock section of Somerset, all wages in every wage agreement district are now at the minimum; they are either "subsistence wages" or wages representing the minimum percentage on basis rates. Consideration of these wages and of the extent to which they are inadequate or more than inadequate, may start from any one of three distinct standpoints. One way is to compare the mining wages now in force with those in some period before the war, allowing for intervening changes in the cost of living. Another way is to compare the mining wages now in force and their changes since before the war, with wages and changes of wages in other industries. Yet a third way is to make an estimate of actual requirements for maintaining the health and strength of the miner and his family and to compare the wage needed to cover these requirements with what he is actually receiving. These three ways of approaching the problem are not mutually exclusive; it is desirable indeed to use them all, and reference is made to each of them below.

Miners' Wages and the Cost of Living.

The first mode of approach is perhaps the commonest at the present time in wage discussions. In so far as it is used as a self-evident basis for claiming present wages equivalent in purchasing power to pre-war wages, it is open to the criticism that it assumes the possibility of all classes of workpeople being as well off after as before the war. It leaves none of these classes to help to pay for the war; more accurately, it assumes without enquiry either that the whole burden can and should be borne by other classes, or that technical developments since the war must have been sufficient at least to compensate for all the destruction of capital and diversion of energy that has taken place.

To this point it may be necessary to return later. For the moment it is sufficient to ascertain the facts of the comparison. In the first memorandum put before us by the Miners' Federation it was submitted that money earnings in the second quarter of 1925 were then about 53 per cent. above their pre-war level, while the cost of living was about 73 per cent. above pre-war, so that "real earnings were . . . far below pre-war."* This particular comparison is based upon earnings over a period, rather than on wage rates, and is thus affected by the greater unemployment in 1925. If one uses instead, as in considering the proper level of a minimum wage one must use, the earnings per shift worked, there results in place of 53 per cent. a figure of 63 per cent. as representing the average increase in the wages per shift over all classes in mining between June 1914 and the second quarter of 1925; even with this change, direct comparison of the 63 per cent. for wages and the 73 per cent. for cost of living is for a number of reasons misleading. The most important of these reasons are (1) that the figure of 63 per cent. is an overall average, combining all the different classes of workpeople, and not taking into account changes in the proportions of different classes, and in particular the growth in numbers of the less skilled; and (2) that the basis periods taken for comparison in June or July, 1914, cannot fairly be regarded as typical of pre-war conditions, either in respect of mining wages or of cost of living; when a minimum wage is under consideration, it is clearly necessary to take as basis not the best or nearly the best of the pre-war years, but either an average of years or the year of lowest wages. Other points, relating to the construction of the cost of living index, and the supply of free or cheap houses or coal to a part of the mining population, also call for consideration. These points are examined fully in a memorandum printed in Section 7 of the Annex, in which the second half of 1925, in place of the second quarter (when some districts were not yet at the minimum) is chosen for comparison.

The general conclusion is noteworthy. If, as the basis period before the war, the single year 1914, is taken, miners' wages have

* Varley, para. 47.

risen about 64 per cent. to the last half of 1925, and the cost of living about 75 per cent. If, as the basis period before the war, the quinquennium 1909-13 is taken, alike for miners' wages and for cost of living, the former have risen about 78 per cent. and the latter 76 per cent. Having regard to the necessarily approximate character, both of the cost of living index itself and of the other calculations, no importance can be attached to the difference between these last two figures. All that can be said is that miners' wages, at the minimum percentage, as in the second half of 1925, and their cost of living have risen in about the same proportion, and that, if there is any difference, it is probably in favour of wages having risen slightly more.

To this may be added a further practical conclusion, that in view of the important part played by the cost of living index in wage discussions, the Ministry of Labour should be given whatever means are necessary, whether by collection of family budgets or otherwise, to bring the index thoroughly up to date.

It will be noted that the increase of 64 per cent. over the earnings of 1914, is much more than the minimum percentage addition of 33½ per cent. to the rates of 1914 under the 1924 agreement. The difference is attributed partly to revision of basis rates in favour of the workman, partly to the percentage addition to pieceworkers' rates, made when hours were reduced in 1919, having more than compensated for the loss of working time.

Wages in Mining and in other Industries.

The second mode of approach, by comparison with wages in industries other than coal mining, is also illustrated in the memorandum of the Miners' Federation, to which reference has already been made. The average weekly earnings of adult miners during the second quarter of 1925 are there set beside the present weekly wage rates in certain other occupations.* In the evidence of Sir Horace Wilson, on behalf of the Ministry of Labour, comparison with other industries is made in another way, by showing the percentage change of wage rates in each between 1914 and 1925. At our request Sir Horace subsequently furnished us with another memorandum, making similar comparisons with the quinquennium 1909-13 in place of July or August 1914 as basis period; this is printed in Appendix No. 27.

Such comparison of percentage changes in various industries since the war, though it has its uses in suggesting subjects for inquiry, cannot lead to any definite conclusion. The fact that the wages of railway porters have risen 150 per cent. since before the war, while those of shipwrights have risen only about 50 per cent., is not in itself a reason either for lowering the wages of porters or for raising those of shipwrights; the porters may have had unduly low wages before the war. If one is to use comparisons with other industries at all, in determining wages for a particular

* Varley, para. 39.

class of workpeople, the actual wages at the present time call first for consideration; historical comparisons, though not to be neglected, are of secondary importance.

We have prepared accordingly and print below a table setting out for important or typical classes of adult male workpeople in various industries the present wages for a full week and its percentage increase on the quinquennium 1909-13; together with the hours in a full week before the war and now. The table is based for the most part on memoranda supplied by the Ministry of Labour and has been checked and corrected by them throughout. The table has neither the detail nor the completeness required if we were forming a judgment on the wages of any other industry. Its object is simply to show in broad outline where mining wages now stand in relation to other wages, and in broad outline also how the fortunes of different classes of workpeople have changed since before the war. For this latter purpose the table has been divided into two sections—one dealing with labourers and semi-skilled men, the other with skilled classes; in each section the occupations have been arranged roughly in a descending order of increase on pre-war wages.

Table 15.

WAGES AND HOURS OF ADULTS IN COAL MINING AND OTHER INDUSTRIES.

Occupation.	Percentage Increase of Weekly Wage Rates from 1909-13 to Sept., 1925.	Wage for Full Week, Sept., 1925.	Hours in Full Week.		
			1914.	1925 (Sept.)	
(1) LABOURERS AND SEMI-SKILLED MEN.					
RAILWAY SERVICE :					
Goods Porters(industrial area)	About 150 for these three Grades	50s.	Varied	48	
Porters—Grade II (industrial area).		46s.		"	48
Engine cleaners		46s. 4d.		"	48
BUILDING : Labourers	About 125	55s. 7d.	49½	44½	
DOCK LABOURERS	About 90 to 140 per day	11s. to 13s. 6d.	See	Note	
ELECTRICITY SUPPLY : Labourers	About 120	54s. 10d.	54	47	
GAS WORKS : Labourers	" 115	52s. 11d.	53½	47	
LOCAL AUTHORITY (Non-Trading Services) :					
Labourers	Nearly 110	53s. 5d.	52	46½	
TRAMWAYS :					
Conductors	About 112	54s. 9d.	57½	48	
Drivers	" 100	59s. 2d.	57½	48	
ROAD TRANSPORT : One-horse Carters.	" 125	53s. 2d.	63½	48	
Coal Mining :					
Subsistence Wages, Underground and Surface (Principal Districts).	From 65 to 90	7s. 6½d. to 8s. 9d. a shift (say) 41s. 6d. to 52s. 6d. a week	See	Note	
Underground Labourers (1923)	About 75 to 80	9s. 7d. a shift (say) 52s. 9d. a week	46½	41½	
Pithead and Screen Men (1923)	About 80	8s. 2d. a shift (say) 45s. a week	See	Note	
ENGINEERING : Labourers	Between 80 and 85	40s. 2d.	53-54	47	

LABOURERS AND SEMI-SKILLED MEN—*continued.*

Occupation.	Percentage Increase of Weekly Wage Rates from 1908-12 to Sept., 1925.	Wages for Full Week, Sept., 1925.	Hours in Full Week.	
			1914.	1925 (Sept.).
SHIPBUILDING : Labourers ..	About 75 to 80	38s. 5d.	53-54	47
IRON AND STEEL MANUFACTURE : Labourers	—	37s. 4d. to 52s. 4d.	—	45-56 (approx.)
IRON ORE AND IRONSTONE MINING (Cumberland and Cleveland) : Labourers.	27 to 50	5s. 11d. to 6s. 2d. per shift	48-49	48-49
AGRICULTURE (England and Wales) : Ordinary Labourers.	Average between 85 and 90	29s. to 37s. 6d.	—	48-54
(2) SKILLED MEN.				
RAILWAY SERVICE :				
Drivers	Nearly 125 for these three Grades	87s. 5d.	Varied	48
Guards		64s. 4d.		48
Signalmen		59s. 4d.		48
PRINTING :				
Hand Compositors on books	Between 110 and 130	73s. 9d.	50-51	48
Bookbinders and Machine Rulers.		73s. 4d.	50-51	48
BAKING : Table Hands	About 120	64s. 9d.	48-60	48
BOOT AND SHOE MAKING : Minimum Time Rate.	About 100 to 110	60s.	52½	48
BUILDING :				
Painters	110 to 115	73s.	49½	44½
Other Skilled Men	90 to 100	73s. 5d. to 73s. 10d.	49½	44½
WOOL : Yorkshire	See	Note	55½	48
Coal Mining :				
Hewers (Piece-work Coal Getters).	67	13s. 10d. a shift (say) 76s. a week	46½	41½
Timbermen	68	11s. 10d. a shift (say) 65s. a week	46½	41½
COTTON : Lancashire	See	Note	55½	48
ENGINEERING : Fitters	48 to 50	56s. 6d.	53-54	47
SHIPBUILDING : Shipwrights ..	45 to 55	55s. 7d.	53-54	47
IRON AND STEEL MANUFACTURE	See	Note	—	45-56 (approx.)
IRON ORE AND IRONSTONE MINING (Cumberland and Cleveland) : Higher paid men.	27 to 35	—	48-49	48-49

For the Notes see Section 8 of the Annex.

The sources for this table and the qualifications to which it is subject are described in Section 8 of the Annex. It will be noted that in the table itself, no information as to wage increases is given for iron and steel manufacture, cotton or wool. From information set out in the Annex it is fair to say that wages in iron and steel manufacture have risen on the whole materially less than in coal mining, while wages in the woollen industry have risen more; the position of cotton is doubtful.

In fitting coal mining into this table the number of shifts to a full week has been taken as $5\frac{1}{2}$; for reasons given in the Annex, this understates the average for the country as a whole, though it accords with the practice of three important districts. No allowance is made either for irregularity of working through breakdowns or lack of trade or absences through sickness, accident or other individual causes; these affect different occupations to different degrees. Before the war, coal mining was amongst the most regular of occupations. In recent years it has suffered from depression and irregularity. Consideration of wage-rates, however, must clearly be based primarily on what can be earned in regular work, provision for unemployment being made in other ways. To put up wages because unemployment has increased merely means increasing unemployment still more.

Highest and Lowest Mining Wages.

The highest wage given for coal mining in the table—13s. 10d. per shift for hewers—works out, as there shown, at $5\frac{1}{2}$ shifts, to 76s. a week. The actual rate varies considerably by districts. In the principal districts the highest earning is nearly 15s. 6d. a shift, say 85s. a week in South Yorkshire and just over 15s. in South Wales; both these districts, as it happens, have a six-day week, so that the earning for a full week is over 90s. The lowest money earning is 12s. a shift in Northumberland, but the hewer there, if married, gets a free house and free coal; with the value of these privileges his weekly income at $5\frac{1}{2}$ shifts is 73s. or upwards. The lowest earnings in any district of any size, taking house and coal privileges into account, are about 70s. in Lancashire and Scotland and parts of the Midlands. As against house and coal privileges, something must be set for deductions on account of explosives and other charges. Broadly it may be said that hewers' average earnings for a full week at the present minimum percentage range from £3 10s. to £4 10s.; for the whole country, since six shifts are commoner than five and a half as a full week, something over the 76s. given in the table would be a fair figure.

The lowest adult mining wage in any of the large districts is represented by the man on subsistence at 7s. 6½d. a shift in Lancashire. There a six-day week is the rule, so that a full week's earning is 45s. The subsistence wage in Northumberland and Durham, where eleven days only are worked each fortnight, is also in the neighbourhood of 7s. 6½d., yielding a full money wage of 41s. 6d., but in these districts all married men get in addition, free coal and free houses or allowances in lieu thereof. In Yorkshire the lowest paid man gets 8s. 9d. a shift and may work six shifts a week, making 52s. 6d. In Scotland, the subsistence wage is 7s. 10½d. a shift with a proviso that the allowance added in any particular case shall not exceed 1s. 1½d.; something less than 7s. 6d. may therefore be paid in some cases. In Cannock Chase, subsistence wages range from 6s. 10½d. to 8s. 0½d., and in

most of the smaller districts they are lower, down to 6s. or thereabouts. The Lancashire figure of 45s. may be taken as fairly representing the lowest adult wage for a full week's work over any large district

The position of coal mining in the table is interesting. In each section, in respect of progress since the war, it comes off materially worse than transport and local services and than industries like printing, building and baking, which serve the home market; in each it is nearer to, but on the whole better off than, the great exporting industries—iron and steel, engineering, shipbuilding and probably cotton—which contributed so largely to our former prosperity. In actual wages, in the unskilled or semi-skilled section, at 5½ shifts it is not as well off as transport services and building, though it has shorter hours to compensate for underground conditions; it is materially better than engineering and shipbuilding. On the skilled side its advantage over these and other staple industries is more marked; whether the relation shown between the full week's earnings of enginedrivers, compositors or painters on the one hand, and hewers or timbermen on the other hand, is a fair one is a matter of opinion. In both sections, and alike in respect of present wages and of progress since 1909-13, the coal miner is substantially better off than the ironstone miner.

An interesting contrast between coal mining and other industries is that in the former, in spite of the subsistence wage provisions, the earnings of the skilled man have risen in proportion not much less than those of the unskilled. Elsewhere—notably in engineering, shipbuilding, and building—the wages of the lower paid men have advanced since before the war much more rapidly than those of the highly paid men. There has been a levelling up which while it may somewhat have reduced the reward of special skill has also tended to diminish extreme poverty. In mining the system of percentage additions to more or less stationary basis rates, with certain other factors, has kept the gap between the highest paid and lowest paid man nearly as wide as ever; reckoned in shillings per week it is of course wider.

The table itself shows with sufficient clearness how impossible it is to insist that real wages shall in no case be below those ruling before the war. To hold rigidly to this may be possible in the industries sheltered from competition or not bound to find markets abroad. For the better paid men in industries like engineering, shipbuilding and iron and steel it has had to be frankly abandoned. To hold to it in coal may mean violent contraction of the industry and a disastrous degree of unemployment.

Wages in Transport and Local Services.

Particular attention was drawn by the Mining Association to the burdens laid on the mining industry by high railway freights, dock charges and local rates. They attributed all these, in part at least, to the relatively high wages paid in transport and in

municipal service. Some information as to average wages in these occupations is given in the table printed above. Railway-men's wages have recently been the subject of enquiry and decision, and we need not refer to them further. It may be of interest, however, to give some further information as to wages of municipal employees, and of men engaged in the transport of coal as trimmers at the docks.

The table on p. 161, supplied by the Ministry of Labour, gives the actual rates for certain classes of unskilled municipal employees in a number of large towns.

It will be seen that, without exception, the rates for able-bodied men are well above the lowest subsistence wage in mining, taken as 45s., while in more than half the cases they are above the highest subsistence wage, taken as 52s. 6d., and above the average of underground labourers in all districts, taken as 52s. 9d. In some towns, notably London, Swansea, and Bristol, they are very much above these figures. In Newcastle the wages of municipal labourers are higher than those of fitters or shipwrights, and in Hull they are nearly as high. The hours in municipal service are almost invariably 47 or 48, that is to say, longer than the miner's hours at 5½ shifts a week, whether on the surface or underground.

The earnings of coal-trimmers for recent years were furnished to the Commission by Mr. Brett on behalf of the Shipping Federation and are printed in Appendix No. 30. The average earnings for the first nine months of 1925 for all the Tyne Docks and Staiths were 117s. a week. For the ports of Cardiff, Penarth and Barry the average for the first eleven months of 1925 was 84s. 10d. These amounts, as is pointed out in the chapter on Conveyance, include certain charges not usually reckoned as part of wages.

These earnings are considerably higher on the average than those of the highest paid classes of workers in the coal mining industry.

Subsistence Needs and Family Allowances.

The third mode of approach, by consideration of what food, clothing, housing and other things are required to maintain the worst paid members of the mining population at the lowest permissible standard of living, and of how much those requirements would cost, is for the determination of a mere subsistence wage the most logical, perhaps the only logical, one.

The practical difficulties in getting any guidance to the suitable level for a subsistence wage from such a consideration of actual requirements are two-fold. There is, first, the difficulty of agreeing on the minimum requirements for the well-being of any individual. There is, second, the great variation in the requirements, however measured, of each wage-earner according to the number of persons dependent on his wages. A subsistence wage adjusted to the

Table 16.

RATES OF WAGES AND HOURS OF LABOUR OF CERTAIN CLASSES OF WORKPEOPLE EMPLOYED IN THE NON-TRADING SERVICES OF SOME OF THE PRINCIPAL LOCAL AUTHORITIES IN GREAT BRITAIN.

(According to the information in the possession of the Statistics Division, Ministry of Labour, at February 1926.)

Town.	General Yard Labourers.		Road Labourers.		Scavengers.		Refuse Collectors.	
	Rate.	Weekly hours.	Rate.	Weekly hours.	Rate.	Weekly hours.	Rate.	Weekly hours.
	Per wk.		Per wk.		Per wk.		Per wk.	
	s. d.		s. d.		s. d.		s. d.	
London (L.C.C.)	62 1	47	62 1	47	59 2	47	—	—
Birmingham	51 10½	47	51 10½	47	51 10½	47	53 10½	47
Bristol ..	60 6	47	60 6	47	55 0	47	55 0	47
							Sweepers	47
							54 10	
Cardiff ..	56 9½	47	54 10	47	54 10	47	Ashmen	
			or				56 9½	
			56 9½				Drivers	
Glasgow ..	55 0	48	55 0	48	55 0	48	58 9	
							2 6½*	48
Hull.. ..	52 0	47	52 0	47	52 0	47	per ton	
Leeds ..	48 11½	47	48 11½	47	42 0†	48	52 0	47
Liverpool ..	53 2	47	53 2	47	49 5	47	48 11½	47
Manchester	53 2	47	57 2	46½†	49 5	47	58 11	47
			54 1	44†			53 2	47
Newcastle ..	59 8½	47	59 8½	47	51 10½	47	55 9½	47
							Horse	
							56 0	
							Motor	
Nottingham	54 10	47	54 10	47	54 10	47	Drivers	48
							.63 0	
							Loaders	
							57 0	
Plymouth ..	55 11	44	55 11	44	51 1	47	51 1	47
Sheffield ..	54 10	47	56 9½	47	48 6	47	49 6	47
			or				to	
			58 9				57 6	
Southampton	48 3	47	48 3	47	48 3	47	48 3	47
Stoke-on-Trent	50 6	47	53 6	47	50 6	47	52 6	47
Swansea ..	62 8	47	62 8	47	62 8	47	62 8	47

* Estimated to be equivalent to 90s. a week.

† Not able-bodied men.

‡ Summer hours, 46½. Winter, 44.

needs of a married man with two dependent children, is more than is usually needed by a single or childless man and less than will sustain a man with a large family. Logically a minimum wage based in any way upon a reasoned estimate of requirements for any given standard of human comfort, involves and should be accompanied by a system of family allowances; that is to say, part of all that is available for the maintenance of workers and their families from the total proceeds of the industry should be allocated, not as wages, but as allowances additional to wages, proportionate in amount to the number of children to be supported by the wage-earner.

Such schemes of family allowances have been widely adopted in other countries. The evidence submitted by Miss Rathbone shows that family allowances are practically universal throughout the mining industry of those countries which compete most actively with our own. In support of this she submitted particulars of their operation in Germany, France, Belgium, Holland, Austria, Czechoslovakia and Poland.* Mr. Frank Hodges, coming before us as General Secretary of the International Miners' Federation, gave similar evidence, both as to the practically universal character of the system in the mining industry on the Continent, and as to the growing disposition of the miners who had had experience of it, to approve it.†

Miss Rathbone submitted calculations showing how a system of allowances for children might work out statistically in relation to the mining industry. The figures used were admittedly rough estimates for illustrative purposes, though as it happens the estimates correspond closely with returns subsequently received by us, as to the average earnings of different classes of workpeople. There is, in any case, no room for doubting that, for any given wages cost per ton, a higher standard of living can be maintained for the mining population, if a small part of what enters into wages cost takes the form of children's allowances, instead of the whole being given simply as ordinary wages. That is to say, the introduction of a system of children's allowances will raise the standard of living if the total wage bill remains unchanged, and may neutralise largely or completely any evil effects that would otherwise result from a fall of wages.

Two subsidiary points remain to be mentioned. The first is that, in so far as children's allowances could and should be paid so long as the father remained on the books of any colliery or attached to the industry, they would automatically help to lighten distress through unemployment. The second point is that, whatever percentage was taken off wages to provide allowances, the actual reduction of average earnings would almost certainly be less than that percentage. As the records of absenteeism show, there is even at this time of low wages a certain, though not very great number of miners, who can earn as much as they want without working every day. It is reasonable to suppose that the bulk of these voluntary absentees are men without family respon-

* Rathbone, Annex III.

† Hodges, para. 5 and Q.9428-9437.

sibilities ; that is to say, just those who on the introduction of an allowance system might lose on wages without making up on children's allowances. They would find an easy way of filling any gap in their income by more regular attendance, incidentally increasing not only their own output but the general efficiency of their colliery.

6. CONCLUSION.

At the end of this survey of the problem of mining wages, we set out briefly our main conclusions.

First, the wage agreements of 1921 and 1924 embody two principles of essential value, both of which should be preserved: that of an economic wage determined from time to time on ascertained facts as to the economic condition of the industry in each district, and that of a minimum wage settled for each district on principles approved nationally.

Second, the satisfactory working of these agreements in respect of the economic wage has been hindered by several difficulties, of which the chief is that relating to transfer prices on sales under associated conditions ; a radical change of methods for ascertaining these prices is in our view essential. Almost equally important are other changes which we propose, for giving workmen a share in the distributed profits of individual mines ; for excluding from the wage-ascertainment the smaller undertakings ; for postponing recoupment of excess payments by the mine owners. To these we add minor suggestions for inclusion of subsistence allowances in wages costs rather than in other costs ; as to the treatment of amortisation charges, and directors' fees ; for extension of piecework payment, and other matters.

Third, a minimum wage is necessary, both in the form of a subsistence wage guaranteeing so many shillings at least per shift to even the lowest paid workman whatever his basis rate or percentage addition, and in the form of a minimum percentage guaranteed to every man on his basis rates ; but the present subsistence wages and the minimum percentages call for reconsideration district by district. A satisfactory subsistence wage system pre-supposes a family allowance system, such as we suggest below. The fixing of a uniform minimum percentage for every district with reference to a single standard year, chosen arbitrarily, like 1914, produces indefensible anomalies.

Fourth, apart from district anomalies, the minimum wage since 1924 has been fixed so high relatively to the economic ability of the districts as practically to obliterate and replace the economic wage ; to a large extent it did so even between 1921 and 1924. Whether in future a simple readjustment of district minima at something like the present level is all that is required, or whether the general level must be lowered, will be discussed when we come to consider later the present position and prospects of the mining industry. Here it is only necessary to say that, while mining wages are even now lower than we desire and hope to see them, we cannot, comparing them either with those of other great industries

exposed to world competition or with pre-war wages, regard any decline from the present minimum percentage as in itself indefensible.

Fifth, irrespective of the level of wages, we regard the introduction of a system of children's allowances—to be paid for out of a single pool, either for the whole industry or for each district that adopts it—as one of the most valuable measures that can be adopted for adding to the well-being and contentment of the mining population. If the total sum available for workers' remuneration can be kept at the present level, the allocation of a small part of this to children's allowances will raise materially the general level of comfort ; if the full remuneration cannot be maintained, the harmful effects of any reasonable reduction can be largely mitigated.

Sixth, the machinery of wage regulation, in the future as in the past, should provide for all the elements that have to be considered in fixing wages. There are, first, the factors relating to the particular colliery and the particular grade of workman and place of work ; these must be allowed for by local settlement of basis rates, subject to appeal to district authorities. There are, second, the factors that relate to the district, defined as a coalfield of roughly comparable physical and economic conditions ; both the economic wage and, within limits, the minimum wage may vary from district to district, and a large part in settling them should be taken either by district authorities or on consideration of district conditions. But the third element—the factors affecting the country and the industry as a whole—cannot be excluded. The general principles for determining wages, whether economic or minimum, should be laid down by a single authority of national scope. There should be no abandoning of the principle of national wage agreements. There may be advantage, if the two parties agree, in having a National Wages Board, which shall bring in also impartial elements outside the coal industry itself.

Seventh, in the course of our inquiry it has been necessary, for purposes of comparison, to take account, not only of mining wages, but of wages in other industries, in transport and distribution, in services like the supply of electricity or gas, and in municipal services generally. It is not our place to pronounce judgments as to these other industries, and we have not the material for any considered judgment. But the differences in the present remuneration of labour of comparable degrees of skill, responsibility and risk in different industries are notable, and suggest the need for some reference to general standards when the wages of any particular class—be they coal miners or bricklayers or railway servants or compositors or municipal labourers—are under consideration. Otherwise there is a real danger that wages in certain industries which are ultimately governed by economic conditions and the competition of other countries may be unduly depressed in relation to wages in other industries which can be fixed by statistical calculations of the cost of living. The burdens left by the war may thus be unfairly distributed.

CHAPTER XIII.—HOURS.

The working hours of miners underground have been regulated by law in Great Britain since 1909. Before that date, they were the subject of agreements between employers and workpeople in each district, and varied greatly from one district to another and one class of labour to another. Thus in Durham the hewers had obtained by agreement, so long ago as 1891, a limitation of hours, making their working day shorter even than the legal maximum now in force under the Seven Hours Act. The Northumberland hewers had secured a similar arrangement at a much earlier date. In each district two shifts of hewers—morning and afternoon—were almost universally employed. By way of contrast, the hours of certain other classes of underground labour in Durham and Northumberland were exceptionally long, one set of haulage workers conveying the mineral got by both shifts of hewers; the hours worked by boys under 16 in these districts were among the longest of all. In other districts—notably Lancashire and South Wales—the time underground was long for all classes, and for some exceeded ten hours.

The uniform limitation of underground hours by Act of Parliament was one of the main objects pursued by the Miners' Federation, which from small beginnings in 1888 had grown by 1900 to cover all the districts, except Northumberland and Durham, and nearly half of all colliery workers. This object was achieved in 1908 by the passage of the Coal Mines Regulation Act, coming into force for the country generally on 1st July, 1909, and for Durham and Northumberland on 1st January, 1910. The Departmental Committee appointed beforehand to consider the economic and other effects of an eight hours' day, had taken as the basis of their discussion a "true" eight hours' day, that is to say, had contemplated a measure under which the average time spent by each workman underground would be eight hours; the Coal Mines Regulation Bill was introduced in this form. In passing through Parliament, it was amended in such a way as to add to the time that might be spent underground one winding time, that is to say, the time spent either in lowering the whole of a shift of workmen into the pit or in raising them again. This time varies greatly according to the number of men, the capacity of the cages, and the speed of winding. It may be as much as an hour or as little as two or three minutes, or may virtually disappear in mines approached by slopes or adits. The average even for whole districts ranges from 26 minutes in Northumberland to 41 in Lancashire.

The average winding time for Great Britain as a whole has usually been estimated in the past at 37 or 39 minutes. These figures represent the average of the winding times authorised for each pit by the Mines Inspectors. The authorised times include an allowance of 25 per cent. added as a margin for contingencies to the actual times of ascent or descent calculated by the Inspectors; if this allowance be taken off again an average of almost exactly 30 minutes is reached. A return obtained by the Mining Association for October, 1925, gives an average of 36 minutes, which is comparable with the 37 or 39 minutes quoted above. In their evidence before us the Mining Association gave arguments to show that the average addition, through winding time, to the hours actually spent by individual miners below ground would be even less than half an hour.*

Effect of Eight and Seven Hours Acts.

For all practical purposes the estimate of half an hour, as the average time spent underground on account of winding time, is sufficiently accurate. The average time, however, that could be spent underground after the passing of the Eight Hours Act up to 1919 was not eight hours plus this half an hour, or $8\frac{1}{2}$ hours in a day, but rather less; the working day of substantial numbers in Durham and Northumberland was, and remained, below the new legal limit. According to the most accurate estimates which it now seems possible to make, the average underground time just before the Eight Hours Act may be put at 9 hours, and that after at 8 hours 20 minutes. The overall reduction of underground time effected by the Act was thus 40 minutes. Taking all classes of workpeople together the reduction of working time at the face, if unproductive time spent below in travelling, meal times, and the like be assumed to have remained unchanged, was about 30 minutes, from 7 hours 10 minutes to 6 hours 40 minutes, or about 7 per cent. The calculations on which these estimates rest are described in Section 4 of the Annex.

In accordance with interim reports presented by the Coal Commission of 1919, "seven hours" was substituted for "eight hours" in the Act of 1908; that is to say, as from July, 1919, the maximum time that might be spent underground was fixed at seven hours plus one winding, or according to the estimate made above, at an average of about $7\frac{1}{2}$ hours for the country as a whole. All the members of the 1919 Commission agreed in recommending reduction to this point. The miners' representatives

* Lee, Q. 5881-5900.

held a reduction to six instead of seven hours to be justified immediately. The chairman of the Commission, and three others (Mr. (now Sir) Arthur Balfour, Sir Arthur Duckham and Sir Thomas Royden) recommended that this further reduction should be made as from July, 1921, "subject to the economic position of the industry at the end of 1920."

It was estimated by the Commission that the substitution actually made, of seven hours for eight, would reduce the output of the industry by a "little under 10 per cent. per annum." Different workers would be affected differently; the rates of all piece-workers were raised by such amounts as would enable them to earn in the shorter day just as much as they were earning before. In most districts, of course, the effect of the Act of 1919 was to reduce time underground by an hour. Allowing for the shorter hours already being worked in Durham and Northumberland, the effect was to reduce the average time in the country as a whole for all workers underground by a little more than 50 minutes. If we assume, as before, no change of travelling and meal times, the working hours at the face were also reduced by 50 minutes to 5 hours 50 minutes, or by rather more than 18 per cent. below those of 1905.

Proposal of the Mining Association.

The main proposal put before us by the Mining Association for the improvement of the economic position of the industry, was that the steps taken as a result of the Commission of 1919 should be reversed; that is to say, that "eight" should be substituted for "seven" in the existing Act, and that piece-rates should be reduced to a point at which they would give to the piece-workers for the longer day substantially the same earnings as they now obtained. The Association contemplated the necessity of further reductions of wages, in certain districts at least, if the industry was to pay its way, but these may be left out of account for the moment. It was estimated in the final memorandum of the Association* that the return to eight hours, with the accompanying change of piece rates, would reduce the cost of producing coal by amounts varying for the principal districts from 1s. 6d. per ton commercially disposable in Northumberland to 3s. in South Wales; in an earlier memorandum the average saving for the country as a whole was put at 2s.† This recommendation to restore the legal working day as it existed before 1919 was very strongly pressed by the Association. It was supported by individual witnesses of high authority not connected with the Association, such as Sir Richard Redmayne and Mr. C. P. Markham.

* Evan Williams, Table I in Memorandum of Evidence.

† Lee, para. 114.

The argument of the Mining Association on this point is forcibly set out in the following paragraphs from their final memorandum:—

“The economic gap between the existing cost of production and the existing world-price can only be substantially bridged by a return to longer working hours.

“The Mining Association therefore strongly urge that the first step to be taken in any sound policy of restoration is a return to the hours of work in operation prior to 1919.

“Whether this is to be regretted or not, from a social standpoint, may be a matter of opinion; but hours of work are not finally determined by theories as to social conditions that ought to obtain in any country. Standards of living must rest upon stable economic conditions. They are determined by volume of trade, security of employment, and the amount of the earnings that the worker can take home at the end of the week and their purchasing power.

“In the last resort the number of hours to be worked is a matter of individual and national necessity.

“In a world-competing industry like the coal industry, trade is only possible provided the price of British coal can be brought into line with the price at which competing countries are prepared to sell. . . .

“The longer hours worked on the Continent of Europe and the relatively substantially lower wages paid there are factors that must be reckoned with and met, if trade is to be secured, employment given and wages paid.

“A return to longer hours of work will not by itself entirely meet the situation, but it supplies a necessary, ready and self-evident part-solution which no other proposed remedy provides.

“Such a return to the longer working day will at once confer all-round advantages. It will benefit the worker by securing for him a larger volume of trade, steadier employment and larger earnings than are possible if the existing conditions continue. It will assist towards the industry being placed upon a sound financial basis, which is much more to the advantage of the worker than he generally realises. - And further, it will be of enormous advantage to the country as a whole in stimulating the consumption of coal in the large dependent industries and in steadily increasing the volume of our foreign trade upon which the prosperity of the community so vitally depends.”*

* Evan Williams, paras 23-25.

This argument suggests two important points for further inquiry, namely the hours actually worked by miners in other countries, and the conditions under which the saving of working costs by increased production in the longer day would be realised.

Mining Hours in Other Countries

Consideration of miners' hours in other countries is germane, both to the question of the terms on which this country can compete with other countries and to the question of the standard of life which it should seek to establish for miners. Underground hours are regulated in most such countries either by law or by extensive collective agreements. It is by no means easy to interpret exactly these laws and agreements, with their varying provisions as to excluding or including winding times, and so to be certain that like is being compared with like; a good deal of discrepant evidence was given to us. As the result, however, of special inquiries made for us by the Ministry of Labour (the results of which are set out fully in Appendix No. 25), we have prepared the table printed on the next page, in which we give, subject to one general assumption as to the length of winding times, the average number of hours now spent underground in each of the principal mining countries of Europe, during a day of 24 hours, with corresponding figures for 1913 or some other year just before the war. Since the practice of the various countries differs in respect of Saturday working, we give also the hours underground in a full normal week. It was suggested to us that, in some countries at least, the law was not stringently administered and that the actual hours might habitually exceed the legal limit. It is impossible to say that this is never the case, but we know of no evidence to suggest common disregard of legal requirements; on the contrary, in certain countries at least, agreement between the employers and workpeople has resulted in a shorter time underground than that prescribed by the law; it is to these shorter hours that the table refers. A second table shows the hours worked on the surface.

The one general assumption to which reference has been made, is that of treating the winding time in each country as roughly half an hour, wherever this time enters into the calculation of the average number of hours spent underground. Accurate and comprehensive information as to other European countries is not available. Their mining conditions, however, are broadly comparable with our own, and something like the same winding times may fairly be assumed for purposes of broad comparisons. There is ground for believing that in France and Belgium, the mine-owners are able, in some cases at least, so to arrange their windings as to make the average time spent underground under the 8 hours limit appreciably more than $7\frac{1}{2}$ hours. This is explained in the notes to the table and is referred to again below. Apart from this, such information as is available supports the general correctness of the assumption made in the table.

Table 17.

AVERAGE TIME SPENT UNDERGROUND IN VARIOUS COUNTRIES IN THE YEARS 1913 AND 1925.

Country.	1913.		1925.			
	Limit of Hours and how measured.	Daily Average Hours underground of each man.	Limit of Hours and how measured.	Daily Average Hours underground of each man.	Hours underground in a full week.	Estimated working time at coal face per day.
Great Britain ..	8 hours from last cage down to first cage up	8½	7 hours from last cage down to first cage up	7½	40½ to 45 (c)	5½
France	8 hours from last cage down to first cage up	8½	8 hours from first cage down to last cage up (a)	7½	45	6 to 6½
Belgium	9 hours from descent to ascent of each man	9	8 hours from first cage down to last cage up (a)	7½	45	6 to 6½
Holland	8½ hours from descent to ascent of each man	8½	8 hours from descent to ascent of each man	8	48	6½
Germany (Ruhr) ..	8 hours from last cage down to first cage up	8½	8 hours from descent to ascent of each man	8	48	6½
Germany (Upper Silesia)	9 hours from last cage down to first cage up	9½	8½ hours from descent to ascent of each man	8½	51	7
Czechoslovakia ..	9 hours from descent to ascent of each man	9	8½ hours from first cage down to last cage up	7½ to 8 (b)	46½ to 48	6½ to 6¾

(a) It is assumed that the average winding time for the whole shift as understood in Great Britain is the same as in Great Britain. It appears, however, that the practice which is often adopted in France and Belgium is to subdivide the shifts into smaller units, to apply the maximum period to each unit separately, and thus to extend the maximum period below ground of the average man to a period which may be as much as 7 hours 50 minutes, making the working week 47 hours.

(b) This is the maximum. If the double winding time exceeds one hour the daily average time underground of each man is reduced by an amount equivalent to half the excess. The double winding time is generally 1 to 1½ hours.

(c) The lower figure represents eleven days a fortnight with Saturday one hour less than an ordinary week day; this is the general practice in Northumberland. The higher figure represents six full days a week, as worked in South Wales. The hours in Scotland, Yorkshire and Lancashire for the most part lie between these two extremes.

Table 18.
AVERAGE TIME WORKED ON SURFACE IN VARIOUS
COUNTRIES IN THE YEARS 1913 AND 1925.

Country.	1913.		1925.	
	Daily Hours on Surface.	Hours on Surface in a Full Week.	Daily Hours on Surface.	Hours on Surface in a Full Week.
Great Britain.. ..	9	54	7½	46½ (a)
France.. ..	10 (d)	60	8 (a)	48 (a)
Belgium	8 (d)	48	8 (a)	48 (a)
Holland	Enginemmen 8-9 (1911)	51	8	48
Germany (Ruhr) ..	10·8 (c) (1913)	64·8	10 (b)	60 (b)
Germany (Upper Silesia)	12 (f)	72	10 (b)	60 (b)
Czechoslovakia ..	9 or 10 (d)	57	8	48

(a) Exclusive of meal times.

(b) Exclusive of breaks amounting to 2 hours per day.

(c) Weighted average minimum hours per shift under collective agreements in 1913.

(d) Mining Association figures.

(e) Based on 6 days.

(f) Including breaks of 2 hours per day.

The tables do not deal with the United States, where the position is somewhat uncertain. Sixteen of the 48 States in the Union limit by statute the hours of underground labour, but six of these produce no coal and the remaining ten very little. In the important coal States, such as Pennsylvania, Virginia and Illinois, there is no legal limitation of hours. The standard working time is usually given as 8 hours a day for 6 days in the week. This appears usually to mean 8 hours in the actual workplace, *i.e.*, exclusive of time spent in getting to and from the pit mouth. This would make the working time materially longer than in most European countries. It has to be remembered that the working conditions, in respect of depth below the surface, temperature, and ease of working are altogether different.

Table 17 shows, before the war, a convergence upon 8½ hours underground in the chief mining areas—Great Britain, France, and the Ruhr, with Holland. Belgium and Czechoslovakia (then part of Austria) had 9 hours, and Upper Silesia 9½. Since the war, Great Britain, France and Belgium have 7½ hours; the Ruhr, Holland and Czechoslovakia have 8 hours; and German Upper Silesia, with 8½ hours, has still the longest day. It may

be added that, of the minor German coalfields, Saxony and Lower Silesia follow the Ruhr, and Aix-la-Chapelle follows Upper Silesia. In Germany the present hours represent a concession made by the men on grounds of urgent economic necessity, in agreeing regularly to work one hour overtime at the usual rate of wages, beyond the normal day.

If we look at the daily hours alone, as set out in the table, the British miner is now as well off as any of his fellows on the Continent, and better off than many of them, though in no case except Upper Silesia is his advantage as much as an hour. If we look at the week he is, either through a short Saturday or through an 11-day fortnight, in most British coalfields better off than any Continental miners. Even on the daily time he may be slightly better off, that is, spend a few minutes less underground each day than does the average miner in France or Belgium; the winding time there is included in the legal hours and can sometimes be accomplished in less than half an hour.

What would be the effect of adopting the Mining Association's proposal and restoring the hour taken off in 1919? On the assumption made as to length of winding time, it would make the working day of every British miner longer by half an hour to an hour than that of miners in any European coal-field of importance, except Upper Silesia. Subject to the same exception, it would make his working week about as long as any to be found abroad, and, in many British districts, longer. The comparison with other countries, so far as it bears on the standard of life that we should seek to establish for miners here, tells against the proposal of the Mining Association, rather than in its favour.

There remains the question of how the present regulations as to hours affect the competitive power of the different countries. As to this, the Mining Association urged not merely that the total hours spent underground, in each day probably and in each week for certain, were less in this country than elsewhere, but also that a larger proportion of this smaller time was spent unproductively—in travelling underground. The effective working time at the coal face was given by them as $5\frac{1}{2}$ hours per day in this country and $6\frac{1}{4}$ to $6\frac{1}{2}$ hours in France. The first of these figures is, we think, too low, but it probably is the case that the average time spent by French miners in travelling underground is less than here. This is a natural consequence of the physical conditions of the French coalfields, where the steeper inclination of the seams brings a larger volume of coal into the immediate neighbourhood of any one shaft at different levels, than happens where the seams are more nearly horizontal. Working time at the face, however, is only a single element in costs of production. The French hewer may spend more time at the face than the British hewer; nevertheless the output per person employed in France is barely two-thirds of the output per person employed in Britain.

This, again, does not show the respective competing powers of the two countries, unless wages and other expenses of production are taken into account, unless, in other words, a full estimate of comparative costs of production is attempted. For such an enquiry we found neither the material nor the time available, though we give some information in the Appendix volume, while information was supplied also by the Mining Association. It is clear that, in any case, comparison of working hours or of hours at the face in different countries is of very little value in this connection. All that can be said is that the hours in this country do not differ from those in other countries so substantially as to constitute a very serious handicap.

Economic Effect of Increasing Hours.

The second point for examination is as to the conditions under which any saving in costs of production through the lengthening of working hours would be secured. On the actual calculations submitted by the Mining Association in Table 32 of Appendix No. 8, which accompanied their first Memorandum, and in Table I of their second Memorandum, there is little criticism to make. It is clear that if all miners work an hour longer for practically the same remuneration as at present, and work as hard during each hour of the longer day as during each hour of the shorter one, each ton of coal will be produced at a substantially lower cost than at present. On the figures submitted to us, an average reduction of 2s. per ton is probably under rather than over the mark.

The important point is to consider what is implied in this calculation as to the total output of coal and the numbers employed. The calculation assumes that each miner, on an average, will produce about one-eighth more coal in the longer day than in the shorter. This means either that the total output of coal will be increased by about one-eighth, say 30,000,000 tons or more, the numbers of miners remaining unchanged, or if the total output is to remain unchanged, that the number of miners employed will be reduced by about one-ninth, say 130,000 men. There are any number of intermediate possibilities, involving some increase of output together with some reduction of numbers employed; for the sake of simplicity these may be disregarded.

Looking at the first alternative, while it cannot be said that there is no possibility of ever finding a market for 30,000,000 more tons of coal than at present, it is exceedingly difficult to suggest where that market is likely to be found in the near future. It is certain, in any case, that in order to dispose of, say, 250,000,000 tons of coal the collieries must, on an average, take a lower price per ton than they can get for 220,000,000. This holds true on general grounds, whatever the course of the market; any apparent saving of costs through the lengthening of working hours, if the same number of miners are to be kept in employment, cannot be

a net saving ; part of the initial saving, and perhaps a large part, must be surrendered by the mining industry, in lowering the price so as to find a market for the increased supply.

The second alternative is that the total output may remain the same, but be produced at a lower cost by one-ninth fewer men ; that is to say, by adding something like 130,000 persons to the number of unemployed miners, which in 1925 was already very great. On this alternative, as on the other, the gain through the lengthening of working hours is not a net gain, either to the country as a whole or to the mining industry, if that be taken to include the miners themselves. There is a heavy loss, in unemployment and distress and expenditure to relieve distress, which must be set against the apparent gain.

As the results of the reports of the Commission of 1919, the Government of the day shortened hours and reduced the total output when coal was scarce ; they thus caused large additional supplies of labour to be drawn into the industry to make good the deficiency. If now, at a time of extreme depression, when the supply of coal exceeds the demand, this process is reversed, and the hours are lengthened, large numbers of the men drawn in since 1919 will be forcibly expelled from the industry. It may or may not have been right to reduce the working hours in 1919 ; on that we are not called upon to express a judgment. The increase of working hours now, so far from being a self-evident part-solution for the coal trouble, is full of the difficulties which usually attend reversals of policy.

Further Objections.

There are two further objections to the proposal to reduce working costs mainly by a lengthening of working hours. The calculated saving is not only bound to be off-set by loss in one way or another ; it is also, for more than one reason, a problematical gain. The lengthening of working hours might be followed by reactions both in this country and elsewhere which would neutralise much of the desired advantage.

In the first place, it is obvious that such a step would hardly fail to produce a feeling of unrest among the miners, which would lead in some cases to slackened work and in others to greater absenteeism. It is notable that the reductions of hours, both in 1908 and in 1919, were followed by a marked decline of absenteeism ; the reverse process would probably produce the reverse effect and cause a loss of output, to be reckoned against the hoped-for gain.

In the second place, the change could hardly fail to produce reactions in other countries. If Britain lengthened her hours these other countries would certainly consider whether they should not follow suit. In this way, any gain in power of competing with foreign coal might be swept away. All that would have been achieved would be a general lowering of the standard of leisure in all mining countries.

Conclusion as to Working Hours.

We are unable accordingly to recommend the acceptance of the main proposal of the Mining Association for a return to the 8½ hour day. If a reduction of wages is necessary to enable the industry to surmount its immediate difficulties, this reduction should be made directly, and not indirectly by a lengthening of working hours for the same remuneration. The evil of adding to the already excessive production of coal in the world will thus be avoided. After a direct reduction of wages, if that proves inevitable, wages will rise again automatically as the industry becomes more prosperous. Once hours have been increased, it will be a matter of far greater difficulty for the industry again to retrace its steps.

While, however, we cannot advise that the State should go back on the action taken in 1919 and endeavour to force upon the miners the acceptance of longer hours of work, certain suggested changes of practice deserve serious consideration.

In the first place, the inflexibility of the existing regulations sometimes causes a quite disproportionate loss of time and earnings. This is particularly the case where coal-cutting machinery is in use, with one shift cutting and the second shift following up to clear away the coal. A breakdown of machinery in such cases often causes the loss of time of both shifts under the rigid seven-hour rule, when a very slight extension might enable both to be productive. The making of any exceptions to the general rule should clearly be hedged round by adequate safeguards against abuse, such as reports to inspectors and to pit committees. We cannot think there would be any insuperable difficulty in devising such safeguards.

In the second place, it should be considered whether the definition of working time by the day rather than by the week is everywhere essential. It might be possible and beneficial, at least in certain districts, to allow the daily limit to be 8 hours, or even more, so long as the total of 42 hours, plus one winding daily, was not exceeded in the week as a whole. It was given to us in evidence that in many cases a 5-day week of 8 hours per day, making 40 in all, would be more productive than a 6-day week of 7 hours per day, making 42 in all.

Advantages of Multiple Shifts.

In the third place, it appears to us reasonable that, if the State steps in to limit the time which any individual man may be required to spend below ground, no obstruction should be placed in the way of the fullest possible use of the mine and the national resources by the employment of double shifts of men.

The use of double shifts for coal-getting is not possible everywhere. In some cases it may be precluded by physical conditions or be made difficult by the use of coal-cutting machinery. In other cases for various reasons it may be of no advantage.

In general, the economies made possible by it are very substantial. A larger quantity of coal is obtained on a given day from each face and along each road. The quicker advance of the face generally makes for better roof conditions and so for safety, as well as allowing a saving in timber. Loss of time in putting the stalls in order is obviated.*

The Eight Hours Day Committee, nearly 20 years ago, emphasised the importance of double shifts as a means of meeting any loss entailed in reduction of hours; they thought, however, that the impossibility of procuring the necessary labour might prove an insurmountable obstacle, and discussed ways and means of introducing labour from outside.† Since their report the question has grown in importance, because of the larger expenditure of capital in relation to labour in modern mines. The loss through keeping idle, for 16 hours out of the 24, conveyors and other machinery, improved roads, and power installations, is very serious.

Another change from the position described by the Eight Hours Committee is too noticeable to need elaborate comment. There can be no doubt at the present time as to sufficient surplus labour being available in mining; greater use of double shifts offers the best hope of absorbing into the more efficient mines either part of the large surplus now unemployed, or part of those who might be displaced by the closing of the less efficient mines.

Two coal-getting shifts have been worked for generations in Durham and Northumberland, and are usual in South Yorkshire. In Scotland their use is limited by the extensive employment of machinery. In South Wales there is a fixed policy of opposition on the part of the men, embodied in the rule of the South Wales Miners' Federation set out below:—

“To oppose the system of double shift except where absolutely necessary for the purpose of ventilation, and to secure the abolition of sub-contracting in or about mines, the Executive to use the whole weight of the organisation to secure these ends.”

Since the above rule was adopted the workmen in South Wales have come to an arrangement with the Owners which is embodied in the Conciliation Board Agreement for South Wales as follows:—

“Double shift in the face shall only be introduced by mutual agreement but the Owners shall be given an effective afternoon shift of such number of workmen as are required for clearance purposes and repairing and double shift in headings and places that require to be pressed on for opening the collieries.”

* Redmayne, para. 25 and Q. 2533-2536; Markham, Q. 10067-10076.

† Final Report Part I (Cd. 3505), p. 33.

In other districts, though there is no formal opposition by the men, the single shift system is almost general, except in some of the larger mines. Extension of double shifts in these districts would, as a rule, be an advantage; it is blocked so far as can be seen almost as much by inertia of the employers as by any positive opposition by the men.

Objections to Multiple Shifts.

There are, however, definite reasons leading miners to regard double shifts with prejudice till they have experience of them. The first is the objection to sharing working places and earnings between the two shifts. Pooling of earnings between the men working in the same place on different shifts is practically indispensable under a double shift system; otherwise each may try to get out as much coal as possible himself, and leave to his fellow as much as possible of the unremunerative work of timbering and putting the working place in order.

Dislike of the pooling of earnings is undoubtedly a main cause of objection to double shifts in districts where it has not been established; the men sometimes do not feel that they will be able to trust their partners. In Northumberland and Durham, and other districts, however, pooling of earnings meets with no objection; each man trusts his "marrow" (as the partner is called) and shares with him. What has found universal acceptance in these districts should not be impossible in South Wales.

The second objection is that the women of the miner's family have to be prepared to provide baths and meals at unusual hours; they may have to do so at all hours of the day, if there are two or more in the household working on different shifts. That objection can be removed or greatly reduced, partly by the provision of pithead baths and, if desired, of pit canteens, partly by arranging for all men of the same household to work, if they desire it, on the same shift. Such arrangements are in fact often made. On the other hand it sometimes happens that two men of the same household, knowing one another, prefer to work together as "marrows" in the same place on different shifts. Domestic difficulties, due to double shifting, can clearly be reduced to small limits; those that remain must be treated as part of the price for the shorter hours of labour that are worked in this industry compared with others.

In Northumberland and Durham, double shifts were the accompaniment of the short hours enjoyed for more than a generation by the hewers, under collective agreement with the employers. In South Wales, the working hours were kept long, till Parliament intervened in 1908; double-shifting was hardly considered. Now that all districts are on the same footing in respect of hours, so should they be in respect of the double shifts; protection of the individual miner should not be allowed to

mean wasteful idleness of costly capital equipment. It would be quite logical to provide that preservation of the present working hours should be conditional upon free acceptance by the men of double shifts wherever their desirability could be shown, that is to say, to empower the Secretary for Mines to raise the legal limit of hours in any district where the introduction of double shifts was unreasonably opposed by the men. It would be logical, as an alternative, that in such cases basis rates should be lowered ; the men should make good the loss that is caused by insisting on a more costly mode of working. We hope that, neither in South Wales nor elsewhere, will there be any future need for considering either of these alternatives. The rule of the South Wales Miners' Federation, quoted above, enforcing as it does the uneconomic use of national resources, is a standing obstacle in the way of all those who have to ask for sympathetic treatment of the miners' claims in other directions—for hours, for wages, for the more efficient conduct of the industry, for consultation as to the conditions of work. We trust that the Miners' Federation will be able to prove the value of national action by securing the withdrawal of the rule. We add two recommendations: (1) that in the provision of pithead baths, proposed generally elsewhere, preference should be given to mines where double shifts are being worked ; and (2) that colliery managers generally should, wherever desired, endeavour to arrange that men from the same household should work on the same shift.

In conclusion, while we do not recommend the State, of its own motion, to make any change of working hours or to endeavour to force upon the miners a longer working day than at present, this does not mean that if both employers and workmen were agreed in proposing a change, the State should refuse to accede to their joint request. It is at least possible, though we hope not probable, that the amount of wage reduction or the alternative of unemployment that will be imposed upon the industry if it is to continue with the present hours, may be such as to lead the miners to consider whether they should not escape from these troubles by some extension of working hours. If the Miners' Federation came forward with such a request, it would be difficult to argue that the State should refuse it.

In respect of weekly working hours, the British miner to-day is in most districts definitely, though slightly, better off than the most fortunate of his fellow miners in Europe, and is materially better off than many of them. If a common level of working hours, through the intervention of the International Labour Office or otherwise, could be agreed upon, it might be advisable to accept it, even if it meant some small increase here to meet part-way a decrease elsewhere

The important objections to an extension of working hours would remain unaffected. Extension of working hours at this time of depression is not a natural but an unnatural way of reducing costs and meeting the immediate difficulty. On the other hand, looking away from the immediate difficulty to the time when the various measures which are proposed for reorganisation of the industry shall have had their effect, we see no reason why the standards of living and leisure already won should not be maintained.

CHAPTER XIV.—REGULARITY OF WORK.

Causes of Lost Time.

Irregularity of employment in the coal mining industry is due to causes which fall roughly into two distinct categories. Either (a) work is not available for the men, because the pit is temporarily stopped; or (b) individual workmen fail to present themselves for work on days when the pit is open.

In the first category—stoppage of the pits—the causes are subdivided, in the returns made regularly to the Mines Department, into: (i) Lack of trade or shortage of railway wagons; (ii) Mechanical breakdowns or stoppages of the pit on the occasion of a fatal accident; (iii) Industrial disputes; (iv) Holidays; and (v) Ordinary "stop-days," *i.e.*, days on which, according to local custom, pits do not wind coal.

In the second category—absenteeism—the causes may be divided into (i) Unavoidable absence, due to sickness, injury, etc.; and (ii) Avoidable absence.

Total Time Lost (1924).

The following statement shows approximately (for the year 1924) the average number of days lost in each district from each of these causes:—

Table 19.

District.	Average Number of Days lost per Man owing to						Absence of Workmen due to Sickness and other personal causes.	Total.
	Lack of Trade or Transport.	Mechanical Breakdowns, etc.	Disputes	Holidays.	Ordinary Stop or Idle days.	Total.		
Scotland	16.48	1.70	1.86	9.82	22.27	52.13	11.26	63.39
Northumberland ..	16.88	0.92	0.07	9.18	25.85	52.90	23.68	76.58
Durham	17.15	0.81	0.29	8.14	27.03	53.42	22.76	76.18
South Wales and Monmouth ..	16.86	1.23	2.66	11.88	2.98	35.61	22.32	57.93
Eastern Area ..	19.37	1.15	1.40	12.87	10.33	45.12	26.96	72.08
Lancashire, Cheshire and North Staffordshire ..	28.72	0.93	0.03	12.98	3.31	45.97	23.27	69.24
North Wales ..	30.14	1.80	0.09	8.62	1.90	42.55	22.45	65.00
South Staffordshire and Shropshire ..	14.77	1.70	1.67	12.14	—	30.28	18.46	48.74
Cumberland ..	11.03	1.30	3.38	9.67	14.10	39.48	39.39	78.87
Bristol	6.16	4.82	64.95	9.94	—	85.87	9.88	95.75
Forest of Dean ..	23.27	1.25	3.96	10.23	10.40	49.11	14.12	63.23
Somerset	7.33	0.63	—	9.45	0.41	17.82	18.07	35.89
Kent	1.95	3.30	81.03	8.52	14.67	109.47	15.09	124.56
Great Britain ..	19.31	1.18	1.57	11.29	12.41	45.76	22.73	68.49

It will be seen that the industry as a whole in 1924 lost approximately 46 days from causes which rendered individual pits temporarily idle, and a further 22½ days due to absences of individual workmen for personal reasons; or a total of 11 or 12 weeks on the average for all workmen. These figures do not take account of the definite closing of pits for any considerable period. The effect of stoppages of that character is reflected in a decrease in the number of persons employed in the industry.

Temporary Stoppages of Pits.

The most serious of the causes which brought about temporary stoppages of pits was lack of trade or transport. This varies considerably from year to year. In 1923 it averaged about 9 days; in 1924 about 19; and in 1925 it was as high as 31. Almost all is due to lack of trade; the time lost from shortage of wagons is, in the aggregate, very small.

The customary "stop-days" vary greatly in the different districts. In Northumberland, Durham and Scotland it is the custom at the majority of the pits to observe one, and in some places in Scotland two, idle Saturdays per fortnight. In the Eastern Area, Cumberland, Forest of Dean and Kent "stop-days" amounted during 1924 to an average of about one day per month. In the other districts this factor is negligible.

It will be found too that the total loss of time from all causes in this category differed appreciably from district to district. Amongst the larger districts it varied from 36 days in South Wales and Monmouthshire to over 50 in Scotland, Northumberland and Durham, a difference of over two weeks' working time.

Holidays.

The average number of days upon which the pits stood idle on account of holidays was 10·07 in 1922, 10·45 in 1923, and 11·29 in 1924.

It will be seen from the foregoing table that the number of days on which the pits were stopped for holidays in Northumberland, Durham and Scotland is appreciably less than those in any of the other large coal-mining areas. This may be attributable in part to the differences in the number of customary "stop-days" in the various districts.

Of the 11·29 days which on the average were observed as holidays in Great Britain, 8·06 are accounted for by Easter, Whitsuntide, August Bank Holiday and Christmas. The remainder represent holidays which for the most part are peculiar to particular districts, such as race meetings, demonstration days and fairs.

Chief amongst these is the Glasgow Fair Week, the second week in July, which is recognised as a general holiday throughout the coalfields of Scotland, with the exception of Ayrshire, where local holidays are for the most part observed.

In no case, apart from officials and clerical staff, is any payment made for holidays, either public or otherwise, in the mining industry.

The arrangements for holidays in other industries are governed partly by custom and partly by agreement. It is only in comparatively recent years that the subject of annual holidays has appeared in collective agreements to any considerable extent, and, where reference is made to holidays, it is almost invariably in order to make provision for payment for the holiday period. A summary of the agreements which exist was given in the Ministry of Labour Gazette for March, 1925.

It is estimated that at the present time approximately $1\frac{1}{2}$ millions of workpeople are covered by such agreements. The majority of them, however, are employed in what are termed "the sheltered occupations."

Absenteeism.

The amount of time lost through the absence of the workmen for personal reasons amounted in the year 1924 to the equivalent of about four weeks of the working time of every man employed in the industry. In Cumberland it was as high as 39 days; in the Eastern area it was 27 days; in Scotland it was only 11 days. These figures relate to absenteeism from unavoidable as well as from avoidable causes.

Unavoidable Absence due to Sickness, Injuries, etc.

No separate statistics have been compiled which distinguish unavoidable absences from avoidable, and it is therefore necessary to make such an estimate as is possible from the general figures available. The high accident rate in the mining industry is an important factor in unavoidable absenteeism. About 40,000 workmen, or nearly 3 per cent. of the total, are absent every day on accident compensation benefit. To this must be added absences from slight injuries and sickness for which compensation is not payable, and certain other unavoidable causes.

The Coal Mining Organisation Committee of 1916, on which both employers and workmen were represented, stated in their Report that "5 per cent. is a liberal allowance to make over all classes of mine labour, surface and underground, for absence from work from sickness, injury, and other unavoidable causes." So far as we have been able to judge, we incline to the view that $4\frac{1}{2}$ per cent. more fairly represents the present rate for unavoidable absenteeism. In the Railways (Conciliation and Shops Grades) the most nearly comparable figure is 3 per cent. It is 3 per cent. also amongst the male staff (excluding war-disabled men) of the Post Office. Allowance, however, must be made for the higher accident rate in coal mining.

Avoidable Absenteeism.

The statistical summaries published officially by the Mines Department give figures for each year under the following heading (which was adopted by agreement with the Coal Advisory Committee, upon which both Owners and workmen are represented)*—"Total of man-shifts lost which could have been worked." The figure for 1924 was over 26 millions. This return is intended to record man-shifts "which could have been worked, because the mines were not stopped." It may easily be misunderstood to refer only to shifts which were lost because the miners stayed away when they could have worked if they had wished. The statement in its present form, therefore, may give an impression which is unfair to the miners, since the total does in fact include absences due to accidents or sickness, i.e. causes over which the miner has no control. If absences due to these unavoidable causes be deducted from the total (using the basis of $4\frac{1}{2}$ per cent. suggested above), the total number of man-shifts lost in 1924 is reduced by more than one-half (or 56.5 per cent.). It seems desirable that the wording of this return should be altered, so as to obviate misunderstanding.

Fall in Absenteeism Rate.

The rate of total absenteeism has fallen steadily during recent years. This may probably be ascribed in part to the progressive shortening of the working day. The total absenteeism rate was 10 per cent. before the Eight Hours Act, 9 per cent. before the Seven Hours Act, and is about 8 per cent. now. If a uniform $4\frac{1}{2}$ per cent. be deducted for unavoidable absenteeism, the corresponding figures for avoidable absenteeism are $5\frac{1}{2}$ per cent., $4\frac{1}{2}$ per cent., and $3\frac{1}{2}$ per cent.—a striking reduction in 20 years. The rate of diminution in the case of hewers has been much the same as in that of other classes.

Incidence of Avoidable Absenteeism.

The figure of avoidable absenteeism which still remains is sufficiently serious. But the position is not adequately stated by quoting an average. If among all classes of the workers and on every day a uniform $3\frac{1}{2}$ per cent. were absent, the organisation of the mines could adapt itself to these conditions. But in fact the hewers, who are the best paid and whose work is in many ways the most arduous, are more prone to absenteeism than other classes. This upsets the balance of labour in the mine, and causes much waste of man-power among the haulage hands and others.

* The same form of words is used by the industry in the Returns made in connection with the Wages Ascertainments

The conclusions of the various official committees who have examined the question of Absenteeism, notably the Miners Eight-hour Day Committee (1907) and the Coal Mining Organisation Committee (1916) have led in each case to the same conclusion. This is also borne out by the evidence given before us by Mr. H. F. Smithson.*

The Mining Association, in response to our request for any figures that they could give us on this subject, supplied us with a table (which is printed in Appendix No. 26) showing the percentages of absenteeism, by districts, on each day of the week ended 17th October, 1925, and distinguishing persons working at the face from persons employed elsewhere underground and on the surface. Though these figures relate to "unavoidable" as well as to "avoidable" absenteeism, they nevertheless confirm the conclusion that hewers are more addicted to absenteeism than other classes of workers, and that abstentions of workers below ground exceed those of surface workers.

Another feature is that the absences are more numerous on certain days than on others. The Coal Mining Organisation Committee found that the days on which the greatest number of miners were absent were apparently determined by custom rather than by any definite cause, and that in general Monday was the worst day. This was confirmed by an enquiry made for the Census of Production, which showed that the percentage of absentees in four selected weeks in each of the years 1907 and 1912 was 13·1 and 10·9 on Mondays, as against 9·0 and 7·6 respectively on Wednesdays. The Mining Association's table already referred to also indicated, on the whole, an appreciable variation between different days, with Monday usually the worst. Mr. H. F. Smithson gave evidence before us to similar effect,† and added that absenteeism was also greater on the day after a holiday, and on the day after making-up day.

Unemployment Statistics.

Coal mining is included under the Unemployment Insurance Act, so that miners in a position to claim benefit lodge their unemployment books at the Employment Exchanges and are returned as unemployed. During the past two years the numbers so recorded increased from a comparatively low figure—about 25,000 at the end of April, 1924—to 146,000 a year later, and then rose suddenly to 315,000 at the end of June, 1925. Since the end of September, when the number was 293,000, there has been a fall, partly due to seasonal causes and partly to the subsidy, bringing the numbers at the end of 1925 to 140,000, or 11·3 per cent. of the insured contributors.

These and similar figures, which attract much public notice, do not distinguish between persons wholly unemployed, in the usual sense of that term, and persons who may be working regularly two or three days a week, but are able to claim benefit under the insurance scheme. At our request the Ministry undertook

* Smithson, Q. 10,626.

† Smithson, Q. 10,616.

a special inquiry with a view to determining what proportion of the total number returned as unemployed were definitely without situations, and what proportion were idle through temporary stoppage at the colliery to which they were still attached. The enquiry showed that at 25 selected Exchanges in coal mining areas in October each of the two categories contained half of the unemployed. Altogether 247,000 persons were then recorded as unemployed. In December, when the recorded total had fallen to 140,000, a more extensive enquiry, covering the whole country, gave a rather different result, only 14 per cent. of the whole number, in place of 50 per cent., being entered as temporarily unemployed. The October figures, based on a small sample, cannot be taken as necessarily typical of the whole country, but the change of proportions suggested is probably a real one; with improving trade those temporarily unemployed appear to be the first to be re-absorbed completely.

These enquiries show that the returns of unemployment based on the administration of insurance must be used with caution. The Ministry of Labour, in publishing them, now distinguish those temporarily unemployed from the others.

Conclusions.

Although, as we have stated above, there has been during recent years a progressive reduction in the rate of avoidable absenteeism, we consider that a serious effort should be made to reduce it further. Such an effort would be stimulated by the profit-sharing arrangements which we recommend in another chapter of this Report.

It would be stimulated more directly, and perhaps more effectively, if the mining industry could rank itself with others in which regular annual holidays with pay have become the custom. No industry needs such a holiday system more than the mining industry, with its predominantly underground employment. But in an industry where the labour costs are so high in proportion to the total costs of production, the economic charge would be much heavier than in others. We cannot expect that this additional burden should be accepted by the industry as a whole in its present economic condition. Some of the more profitable mines may be in a position to make this concession, which would be greatly appreciated by the men. When more prosperous times return, the custom may spread throughout the industry. The cost would be largely recouped through the better organisation of production made possible by the decreased absenteeism that may be expected to follow. The holidays with pay would, of course, be conditional in each individual case upon a reasonable regularity of attendance during the preceding period. It is better that absences should be organised into a regular system, with pay, than continue in an unorganised fashion without pay. The holidays could be arranged for the season of the year when production was least active.

CHAPTER XV.—RECRUITING AND PERSONNEL.

The questions dealt with in this chapter fall into two sections, concerned respectively with the mode of recruiting the general labour supply of the industry and with the appointment of supervising and managing staff of various grades. Comparatively little reference was made to these matters in the evidence laid before us and we deal with them briefly. In themselves they are by no means unimportant.

General Supply of Labour.

The methods adopted for recruiting the general supply of labour to the industry are important, because, as has been pointed out in other chapters, the industry is not a static one. It is subject to continual change, one district growing at the expense of another, new mines being opened and old ones closed. Reference is made to this, in the chapter on the Structure of the Industry, from the point of view of the number of mines opened and closed. Here, reference may be made to two facts illustrating the same point on the labour side.

In the first place, if the numbers of wage earners at different dates are compared, it will commonly be found that in some districts the numbers have been increasing rapidly while others have been falling off. Thus the number of wage earners in July, 1925, was nearly 37,000 less than in July, 1922, taking the country as a whole, but these general figures mask very different tendencies in different districts. Table 8, printed in Appendix No. 18, shows that if the country be divided into 25 districts, 11 show decreases totalling up to 63,000 while 7 show increases totalling 26,000, and 7 small districts show practically no change. As might be expected, the main growth is in South Yorkshire and Nottinghamshire, and the declines are in Northumberland, Durham and South Wales.

In the second place, the annual movement of men into and out of employment at individual collieries is very great, in proportion to the numbers employed. In order to test the extent to which collieries recruit additional staff in the course of a year and the sources from which they are recruited, a special return was obtained. Not all the mines were in a position to give the information desired. The results shown below, however, cover nearly four-fifths of the industry and may therefore fairly be taken as typical. They are summarised in the table below and set out more fully in Appendix No. 18 (Table 14).

Table 20.

Recruitment of Labour in Coal Mines in 1924.

(Based on Returns relating to 79 per cent. of the Industry.)

		<i>Underground Workers.</i>	<i>Surface Workers.</i>	<i>All Workers.</i>
Number employed—				
At beginning of 1924	..	761,120	175,230	936,350
At end of 1924	.. ..	763,558	173,165	936,723
Number recruited—				
From coal industry	..	175,772	10,102	185,874
From other industries	..	17,669	7,444	25,113
Boys and youths from school		20,100	10,104	30,204
Total	.. ..	213,541	27,650	241,191
Number recruited as percentage of numbers employed end of 1924—				
From coal industry	..	23·0	5·8	19·8
From other industries	..	2·3	4·3	2·7
Boys and youths from school		2·6	5·8	3·2
Total	.. ..	27·9	15·9	25·7

The movement of labour shown by the table is striking. The number of persons newly recruited by the separate mines during the year 1924 was, for underground workers, 27·9 per cent. of the total numbers employed by them. Of these, the great bulk, namely 23 per cent., were men already in the mining industry; that is to say, they came from other mines, or were men taken on again at a mine which they had left; 2·6 per cent. were boys and youths taken direct from school, and 2·3 per cent. were taken from other industries. Amongst surface workers, the labour turnover is less, the numbers recruited in the course of the year being 15·9 per cent. of the numbers employed. The recruits came in roughly equal proportions from within the industry, from other industries and from school. Taking underground and surface workers together, the annual turnover of labour was a quarter of the total numbers employed.

The figures relate to a single year and to one affected by some special conditions. During the first four months of 1924 the industry was prosperous and considerable numbers of additional men were taken on; during the last eight months prosperity declined and employment fell off. At the end of the year the total employed was practically the same as at the beginning. It is probable therefore that the year 1924 is not absolutely typical, and that the proportion of recruits to the numbers of employed would be less in normal years. At the same time, the amount of movement shown is surprising and emphasises the importance of taking some steps to direct and organise the movement of labour from one mine to another or one district to another. It is obviously desirable to give to the men who must

be displaced by the closing of uneconomic mines the first chance, in preference to men from other industries, of getting employment in new mines and developing districts.

This is all the more important because, for a variety of reasons, the mining industry is hardly ever likely to be short of an ample, and it may be excessive, supply of boys and youths coming from school. The mining population has always been one of comparatively large families and one which, in spite of relatively high death-rates in early years, tended to grow more rapidly than the rest of the population. On the other hand, the openings for employment of boys in a purely mining area, otherwise than in mining itself, are small. If the miners' sons do not go into the pits, they may in many cases be able to find employment only by going away from home altogether.

In the past, the industry as a whole has been able to expand more rapidly than the population as a whole. If, as is possible in future, the growth of opportunities for employment in coal mining is not going to be so rapid, the difficulty of finding employment even for the children of those already in the industry will become very serious. It is indefensible to accentuate that difficulty by recruiting any substantial number of adults from other industries. The table shows that the number of such recruitments from outside, though not very large, is far from negligible. It amounted in 1924, taking underground and surface workers together, to 2.7 per cent. of the numbers employed. For the whole industry this means something like 30,000 men in a single year.

It is important that the industry should not unnecessarily recruit labour from outside. No arrangements are in force at present for securing this end.

The employment exchanges of the Ministry of Labour deal with miners as with other classes, and substantially all unemployed miners are in fact registered at the exchanges on applying for unemployment insurance benefit. The colliery managers, however, do not to any very large extent apply to the exchanges when they need additional labour or regularly notify the exchanges of vacancies. The total number of vacancies in mining filled by all the exchanges during 1925 was only ten thousand, or less than 5 per cent. of the total numbers recruited in 1924.

The movement of men from one district to another is not, indeed, an easy operation. Even when all difficulties as to selection of men, housing and transfer have been overcome, the results may be disappointing. The diversity of mining conditions makes a miner of one district less likely to be at home in another, and his transfer therefore more difficult than with almost any other class of workman. This, however, in view of the urgent necessity of finding work for men displaced from declining districts, only makes it all the more important that the machinery for transfers should be as effective as possible.

We recommend that the mineowners and the miners should confer together, either nationally or by districts, with a view to considering, in conjunction with the Ministry of Labour, practical steps for securing the transfer of unemployed miners from one district to another and for giving such miners the first chance of obtaining such colliery employment either in their own district or elsewhere, in preference to the recruiting of outside labour.

Supervising and Managing Staff.

The supervising and managing staff falls into four groups—the deputies (or, as they are called in some districts, firemen and examiners), the overmen, the under-managers, and the managers.

The deputies are responsible for applying, under the directions of the manager, the safety regulations. The appointment of a sufficient number of these officials, having regard to the size and arrangement of the mine, is required by the Coal Mines Act of 1911, which also prescribes their qualifications and, to some extent, their duties. Practically the whole of these officials, some 29,000 in number, are recruited from among working miners, to whom the existence of this class offers substantial chances of promotion. The Deputies' Federation have for many years urged that the salaries of deputies should be paid by the State, so as to give them a position independent both of the miners and of the management. This point was put to us by Mr. W. Frowen in giving evidence on their behalf; it was urged that, given freedom from all parties, the fireman could reduce the number of mine accidents*. While appreciating the object in view, we do not think it would be served by the change proposed. The personal responsibility of the colliery manager, implying his personal control, is and should remain the corner-stone of the safety regulations. The division of responsibility between him and a class of independent deputies would be a step in the wrong direction.

The functions of overmen include safety duties and supervision and organisation of pit work, and are generally intermediate between those of deputies on the one hand and of the under-manager or manager on the other. Certain qualifications for the post are prescribed by regulation and they are recruited from the deputies or from working miners.

The managers and under-managers alike must hold certificates of competency, issued after examinations held in accordance with the Coal Mines Act of 1911, and regulations made under the Act. For under-managers a second-class certificate is sufficient; the examination for this is required by statute to be "suitable for practical working miners." For managers a first-class certificate is required; there is nothing in the Statute which, as for the

* Frowen, para. 8.

second-class certificate, could be interpreted as excluding the application of any test of good general education, but by custom the examinations here also are purely technical. For both classes of certificates it is a condition of sitting for examination at all that the candidate should have had either 5 years' practical experience in mining, or 3 years of such practical experience if he holds an approved degree or diploma ; half of this 5 or 3 years must have been spent in " actual practical work " at the face or elsewhere underground, or in its direct supervision or direction.

The object of these regulations is clear and unexceptionable ; those who are to manage mines should have practical experience of them. The effect of such regulations, however, is necessarily to narrow the field from which managers can be appointed, and thus to diminish the number of men of high ability and good general education who are likely to be drawn into the industry. In practice, entry into the managerial side of coal mining is made far from easy to men of general education not already having family connections with it. In coal mining, as in every other occupation, a balance has to be struck between the advantages of practical experience and those of ability and liberal education, between organising the industry so as to give a free avenue for promotion of exceptional ability from the bottom to the top, and organising it so as to draw in well above the bottom men fitted to be its leaders. Whether in coal mining this balance has been rightly struck, or inclines too much in the direction of favouring practical experience at the expense of general education we cannot say, for we have taken no evidence upon the matter. We are deeply impressed, however, by the necessity of securing in this vital industry its full proportion of all the exceptional ability in the nation, and of men of broad views and imagination ; we are not certain that this is likely to happen under the existing regulations. We recommend accordingly that the Mines Department should, at an early date, take the regulations into further consideration from this point of view. Upon the nature of the entrance into any occupation will depend the kind of men who enter ; upon the kind of men who have to manage coal mines, more than upon any system that can be laid down for their management, will depend the prosperity of the industry, and the well-being and contentment of the miners.

CHAPTER XVI—SAFETY AND HEALTH.

Coal mining is admittedly amongst the most dangerous of occupations. At the same time it is one in which dangers have been greatly reduced by precautionary measures that are largely the outcome of scientific research. The extent of the present dangers, and of their reduction as compared with earlier periods, is summarised briefly in the following paragraphs. The tables on which they are based are printed in Appendix No. 18, Tables 20 to 23. The actual figures given cover not coal miners only, but some men engaged in other forms of mining; the proportions of these to the whole, however, are so small that they can make no appreciable difference to the results. It is important to distinguish, in coal mining itself, those who work underground from those who work on the surface; the risks to which the former are exposed are much greater.

Liability to Accident and Disease at the Present Time.

Taking the average of the three years 1922–24 as a fair representation of present conditions, the principal facts relating to underground workers are briefly as follows :—

- (a) The annual death rate from accident is 1·13 per thousand.
- (b) The annual number of "serious accidents" is 4·49 per thousand. This includes not only accidents causing serious personal injury (fracture of head or limb, dislocation of limb and the like), but also all accidents caused by explosions, electricity or over-winding, whether or not serious injury results to any person. The number of these that do not in fact cause serious personal injury is, however, a very small proportion of the total of "serious accidents."
- (c) The annual number of minor accidents causing disablement for more than seven days may be put at 176·4 per thousand. There has been an increase of minor accidents of recent years; there is some, though not conclusive, ground for connecting their number with the state of employment: the prospect of low and irregular earnings tends to keep men on compensation longer than they would be if employment was plentiful and wages high.
- (d) The annual number of new cases of nystagmus is 3·98 per thousand.
- (e) The annual rate of other industrial diseases is 4·20 per thousand.

We may illustrate the risks actually incurred by the miners by applying the facts so ascertained to a group of one hundred men,

who may be assumed to work underground for a period of twenty years. The rates of accident and disease, as summarised above, would have to be divided by ten, since a hundred men are taken instead of a thousand; and be multiplied by twenty, since twenty years are taken instead of one year; that is, the rates given above must be doubled in order to apply to the example that is taken. At present rates of accident and disease, therefore, it may be expected that in twenty years, among the hundred men, in round figures, two will be killed, nine will suffer fracture of the head or limb or other serious injury, eight will contract nystagmus, and eight more "beat hand, knee or elbow or inflammation of the wrist," a total of 27 out of the hundred who will suffer at one time or other from these more serious dangers. In addition, there will be among them during the period 353 cases of comparatively minor accidents, each disabling, however, for a period of more than seven days; that is to say, that each of the men on the average will incur an accident of that character about once in six years. If instead of 353 cases, the number 250 be substituted, so as to allow for the lower number of such cases when the rates of earnings are high, each man would suffer an accident of this class once in every eight years. If a miner worked underground, as many of them do, for forty years and not twenty, these risks would, of course, be doubled.

If workers at the coal face itself are considered separately, the incidence of the industrial diseases would be considerably higher, as about 80 per cent. of the nystagmus cases, and about 67 per cent. of the other diseases, are among this class. Among a hundred face workers the figure for nystagmus would be 12, and for the other diseases 11.

Among the surface workers the rates of death and injury per 1,000 persons employed above ground in the years 1922-24 were: Fatal accidents, .47; serious accidents, 2.47; minor accidents calculated on the seven-day basis, 64.26. The conditions of their employment do not give rise to industrial diseases, except in rare cases.

Comparison with Previous Periods.

The most striking fact brought out by a comparison with the past is that, in the last 50 years, the death rate from accidents has been more than halved among the men employed under ground, and nearly halved among the men employed upon the surface. The rates were, per 1,000 men employed: Underground—1873-82, 2.57, 1922-24, 1.13; Surface—1873-82, .92; 1922-24, .47.

The reduction underground has been mainly due to the striking decrease in the deaths from explosions and from shaft accidents; the former have been reduced by nine-tenths, from .65 per 1,000

men underground to $\cdot 06$; the latter by five-sixths, from $\cdot 32$ to $\cdot 05$. Table 49 in the Statistical Appendix to the Annual Report of the Secretary for Mines for 1924, page 144, shows at various dates the number of "Mining Disasters" caused by explosions involving the loss of 10 lives or more. In the decennial period 1871-80 there were 35 such accidents, causing 2,014 deaths. Since then there has been a continuous decrease in the number of disasters, until in the four years 1921-24 the number was reduced to 3, with a death-roll of 78.

The fatal accident rate from falls of ground shows a less, but still a large decline in the 50 years; from 1.12 per 1,000 men underground to $\cdot 60$. Haulage accidents, however, have been nearly stationary, the rates being $\cdot 32$ and $\cdot 28$; and accidents from miscellaneous causes are also nearly the same, the reduction being from $\cdot 16$ to $\cdot 14$.

If the comparison be made over a shorter period, and the three years 1922-24 be compared with the pre-war quinquennium 1909-13, the tendencies are seen to be similar. Fatalities due to explosions have been reduced from $\cdot 31$ to $\cdot 06$ per 1,000; due to shaft accidents from $\cdot 10$ to $\cdot 05$; due to falls of ground from $\cdot 71$ to $\cdot 60$; due to haulage accidents from $\cdot 30$ to $\cdot 28$; while the rate of miscellaneous accidents remains the same. In the total there has been a reduction of 28 per cent. in the fatal accident rate below ground in the last 12 years or thereabouts. The reduction among the surface workers has been 38 per cent. in the same period.

With regard to the accidents that cause "Serious Injury," there are no comparable figures for the years prior to 1908. The reduction in the rate of such accidents from all causes between 1909-13 and 1922-24 has been 22 per cent. underground, and 29 per cent. on the surface.

In the same period the table of accidents causing disablement of more than seven days (or, in 1924, of more than three days) shows a decrease of 47 per cent. in accidents due to explosions; but an increase under all other heads; and a net total increase of 9 per cent. below ground and 18 per cent. on the surface.

To compare the figures of the last three years with one another would give too narrow a basis on which to form a judgment. But such as they are, they indicate a slight setback in 1923 compared with 1922, which was more than made good in 1924.

Comparisons are sometimes based on accident rates computed per million tons of mineral gotten; but output is affected by too many factors to be a satisfactory standard. For example, 100 tons of mineral was the product of 98 man-shifts worked in June, 1914, and of 137 man-shifts worked in 1920—an increase in the latter year of 40 per cent. in the number of man-shifts. This means that, for the same tonnage of production, there was a substantial increase (even after allowing for the reduction in the length of the shift) in the length of time in which workers were exposed to accident risk. A falling off in output per person employed has the effect, therefore, other things being equal, of inflating accident rates if they are computed on the tonnage of mineral gotten.

The best principle for all such comparisons is one which is based upon the number of man-shifts worked in the year, rather than upon the number of men employed. In a year of trade activity the accident rate, if based on the number of men employed, may appear to increase in comparison with a year in which trade was slack, not because the employment has become more dangerous, but because the men are at work, and therefore exposed to accident, on a greater number of days in the year. Statistics on the man-shift basis are not available, however, for years earlier than 1922. The necessity for such correction may be seen if a comparison is made between the two tables, for the years 1922 to 1924, relating to minor accidents, one based upon the number of men employed and the other upon the number of man-shifts worked. The former indicates an underground accident rate per thousand men of 182 in 1922, 198 in 1923, and 182 in 1924; that is, a considerable increase in the second year, and a return in the third to the level of the first. The latter shows a rate per 100,000 man-shifts worked of 77, 78 and 73 respectively, that is, a very slight increase in the second year and a decrease of over 5 per cent. in the third.

Figures are also available showing, per 100,000 man-shifts worked at the face, the number of accidents of all degrees of severity at the face, due to falls of ground. They are 47.0 in 1922, 44.7 in 1923, and 42.5 in 1924. There are also statistics of the total number of haulage accidents per 100,000 man-shifts worked elsewhere than at the face below-ground. They are 42.2 in 1922, 44.3 in 1923, and 40.5 in 1924.

Industrial Diseases.

Industrial diseases first became the subject of registration after the passage of the Workmen's Compensation Act of 1906. In coal mining, the principal industrial disease is nystagmus, which is a troublesome malady of the eyes, that may incapacitate for work for long periods. With rare exceptions it is peculiar to the miner's occupation. Its incidence shows a rapid increase since 1909-13, the annual rate of new cases per 1,000 men employed underground being 1.58 at that time, 4.56 in 1922, 3.98 in 1923, and 3.43 in 1924.

This increase has naturally caused much concern, and in 1920 the Home Office requested the Medical Research Council to set up a committee to investigate the matter. A committee was appointed, under the Chairmanship of Dr. J. S. Haldane; it presented two reports, the first in 1922 and the second in 1923. The principal conclusions reached were that the chief cause of the disease was insufficient illumination; that the cases severe enough to cause disablement could by degrees be entirely prevented by improving the standard of lighting; that the increase shown in the Workmen's Compensation Statistics does not correspond to any real increase in the number of men who are

disabled from work underground, but is due rather to mistaken views as to the character and treatment of the disease, and to the adoption of an erroneous standard in determining at what stage the disease becomes so severe as to produce disablement and at what stage the incapacity ceases. The Committee made a series of recommendations, upon which the Home Office has based proposals. These are now under consideration in consultation with the organisations of the mineowners and the miners.

There has been a large increase in the number of electric lamps used underground, with a view partly to the prevention of nystagmus; they numbered 357,000 in 1924 as compared with 76,000 in 1914. There has also been a replacement of flame-safety lamps of lower candle-power by flame safety lamps of higher candle-power. These facts are shown in Chart XII of the Fourth Annual Report of the Secretary for Mines. The old-fashioned flame lamps are, generally speaking, those described on that chart as "other types," and the chart shows that since 1914 about 200,000 of these lamps have been discarded, and replaced either by electric lamps or by the modern types of flame lamps.

A slight but unavoidable set-back to this improvement results from the fact that fewer coal mines than formerly can safely be worked with open lights.

The diseases special to mining that affect the hand, knee, elbow or wrist, also show a large increase, though not so large as nystagmus. In the years 1922-24 their prevalence was 54 per cent. greater than in 1909-13. These diseases also have been investigated by a committee of the Medical Research Council, and the recommendations of the Committee have been communicated to the industry.

Comparison with other Industries.

The annual Workmen's Compensation Statistics collected by the Home Office enable a comparison to be made of the number of fatal and of non-fatal accidents for which compensation is paid in various industries. The tables show for 1922-24 an average of fatal accidents per 1,000 men employed in mines of 1.02. For underground workers only the rate, as has been stated above, is 1.13. The only industry where the Home Office tables show that rate to be exceeded is shipping, where the rate is 1.28. In docks it is .75, in quarries .68, in constructional work .53, in railways .50, and in factories .14, or about one-eighth of the rate in mines. In non-fatal accidents the dangers of the mining industry are even more marked. The rate given in the tables is eight times as high as in shipping; it is more than twice as high as in the docks, the industry which shows the next highest incidence; and it is more than five times as high as the average of factories, docks, quarries, constructional work and railways taken together.

Comparison with other Countries.

The available comparative figures are, for the pre-war period, the decennium 1904-13 and, for recent experience, the years 1922-23 (see Table 28 in Appendix No. 18). The figures show the following falls in the fatal accident death rate per 1,000 men employed below ground—in Great Britain from 1.50 to 1.14; in Germany from 2.53 to 2.21; in France from 2.19 to 0.86 (for the year 1922 only); in Belgium from 1.21 to 1.20; in Holland from 1.92 to 1.36; in the United States (assuming 300 days' employment per man per annum) from 5.76 to 5.23. A comparison of the present rates is on the whole very favourable to British mining.

Healthiness of the Occupation.

Apart from accidents and the industrial diseases special to mining, there is no reason to think that the occupation is physically injurious. Indeed, statistical evidence shows that miners as a whole are a healthy class. This, however, might be partly due to the fact that only men of physique above the average enter the occupation or continue in it, and there can be no statistics to show whether this is so or not.

But while it is gratifying to find that the General Mortality Tables show for coal miners, in most age groups, lower mortality rates in 1921-23 than in 1910-12, it is disconcerting that this improvement is less marked than the improvement that has taken place in the corresponding rates for the general male population. The result is that, while in 1910-12 coal miners held the advantage, the position now, except between the ages of 35 and 55, is reversed, and coal miners show slightly higher mortality rates than the occupied and retired male population of the country generally.

The Registrar-General at our invitation has furnished a memorandum on the point, which we print in Appendix No. 32, embodying his views and those of the Ministry of Health. (See also paragraph 12 of Memorandum of Evidence, submitted by Dr. J. S. Haldane.)

It is not easy to give reasons for this change. Accidents do not seem to have contributed to it, nor can it be assigned to any other particular causes of death; all causes except accident, in the Registrar-General's classification, appear to have contributed more or less uniformly. A possible hypothesis, pending further investigation, might be that this *relatively* increased mortality among coal miners is attributable to the large number of men who entered the industry during and after the war, and who were, perhaps, less robust than the average coal miner before the war. But it may be well to make the matter the subject of special inquiry by the Government Departments concerned.

Cost of Compensation.

The total amount paid annually in compensation in the mining industry in respect of industrial accidents and disease was £1,173,000 in 1909-13, and £3,537,000 in 1922-24, a threefold increase. The number of persons employed was 10 per cent. greater in the latter period, but the tonnage of coal produced was slightly less. In the six other groups of industry covered by the Workmen's Compensation Statistics the increase per cent. in the cost of compensation in the same period was 86. The cost of the compensation in the mining industry is now over 1s. per week per person employed, or 3d. per ton of coal produced. The large increase is due to three causes :—

(1) An increase in the number of cases of non-fatal accident. This amounted to 28 per cent. between the two periods.

(2) An increase in the scale of compensation payable, which is proportionate in general to the increase in the rate of earnings and has relation to the rise in the cost of living.

(3) Some increase in the average duration of the disability

Attention has been drawn in the evidence before us of the Miners' Federation* to the large proportion of the premiums paid to accident insurance companies which is allocated to the expenses and the profits of the companies. The matter has been the subject of communications between the Home Office and the Accident Offices Association, and is dealt with in Command Paper 2483 of 1925. It is, however, of small importance so far as the mining industry is concerned, for almost all the employers either meet compensation claims themselves without insurance, or belong to Mutual Indemnity Associations. Of the total sum of £3,376,000 paid in 1924, only £288,000, or 8·5 per cent., was paid through insurance companies.

Conclusions.

It is not within the functions of the Commission to enter into a detailed consideration of the measures that might be adopted to reduce further the rates of accident and industrial disease. That is a matter which is continually engaging the attention of the Mines Department, and is indeed one of its primary functions. If any further inquiry were necessary it would need the prolonged investigation of a body appointed for the purpose. Our duty is no more than to draw attention to the following conclusions which result from the facts which we have stated, and which have a close bearing upon the general position of the industry.

Mining has always been an exceptionally dangerous occupation.

* Baker, paras. 12 and 13.

The death rate due to explosions and winding accidents shows a striking decrease in the last half century, and is at the present time of small proportions. The industry as a whole, and the Mines Department—formerly the Mines Department of the Home Office—are entitled to much credit for this reduction, the result of long research as to causes and preventions, and of constant and active effort.

The death rate from falls of ground, haulage accidents and miscellaneous causes shows some decline, but a comparatively small one. Nearly a thousand deaths still occur annually from these causes.

There has been a generally proportionate decline if the comparison be made between the present time and the years 1909-13.

In that period there has been a decline also, in the accidents classed as serious, of 22 per cent. underground and 29 per cent. on the surface.

The returns of minor accidents show an increase in the same period of 9 per cent. below ground and 18 per cent. on the surface. This is a feature which is coincident with a fall in the rate of earnings, and is probably connected with that fall. In view of the large decline in the rates of fatal and serious accidents we cannot conclude, from the increase in minor accidents alone, that the mines have become more dangerous.

There is an excessive prevalence of nystagmus among miners. This is chiefly due, in the opinion of the special Committee of the Medical Research Council, to insufficient lighting. In the opinion of the same Committee the large increase that has recently taken place in the cases of nystagmus recorded for the purposes of the Workmen's Compensation Act does not correspond with an actual increase in disability.

There is no evidence to show that, apart from accidents and industrial diseases, mining is not a healthy occupation.

The high accident rate makes the charge for Workmen's Compensation a heavy burden upon the industry, amounting to over £3,000,000 a year, or 3d. per ton of coal produced. It is obviously to the interest, as well as being the duty of the industry, to take all practicable measures to reduce the very heavy accident rate.

CHAPTER XVII—HOUSING.

The housing conditions of colliery workers, like almost all else connected with the industry, show great diversities. They are often very bad—many of the old villages consist of poorly constructed cottages, small and frequently overcrowded, with sanitary arrangements primitive and inadequate, the aspect of the villages being drab and dreary to the last degree. At the other extreme there have been built, by some of the large new colliery companies, garden villages, which are well planned, well constructed and well equipped, equal to any in Great Britain. Between the two there is every gradation. In some of the districts, where the housing is usually poor, there may be found groups of excellent new cottages, built by enterprising colliery proprietors or Local Authorities. In some of the districts, where the housing in general is fairly good, there may be found groups of old houses surviving from the days when the standard of construction was low.

The special conditions that attach to the mining industry have their effect upon housing. In most other industries the undertakings can, as a rule, place themselves in some town where housing for the workers already exists. In mining, if travelling by the workers is to be avoided, the houses must be placed where the undertakings are, and the undertakings must be placed wherever the coal may be situated. In the towns and the agricultural districts, there is usually a prospect that a group of houses will be inhabited for as long as they will last. A mining village is often built to serve a purpose which is temporary in comparison. When the pit is worked out the population must move, and the houses will be derelict. In these circumstances there is no inducement to good building at the outset, nor, prior to comparatively recent legislation, had the Local Authorities any effective control over the type of houses to be erected. When the end of the life of the mine is in sight, any expenditure of fresh capital upon building new houses, or rebuilding the old ones, would be uneconomic.

The influence of this factor is intensified by the comparatively short leases that have usually been granted in the past by the mineral owners to the mineowners. In England and Wales the period has been 50 or 60 years as a rule, hardly long enough to promote good building. In Scotland the custom has been only 31 years; and to this cause must be attributed, in no small degree, the exceptionally low standard of housing which has prevailed in the mining districts of Scotland.

On the other hand, where modern collieries are established, to work seams that will last a long time, and under leases running for a lengthy period, the proprietors are often ready to spend very large sums of capital in the erection of good housing accommodation. They not only have the satisfaction of rendering a public service, but they are enabled to draw to their undertaking the best

class of workers. At some of the large new mines in the South Yorkshire and Nottinghamshire coalfield, from one-third to nearly one-half of the total capital provided is being spent upon houses for the workers, sums of £750,000 to £900,000 being devoted to that purpose by individual undertakings.*

We have obtained information upon the present state of miners' housing, and upon the action that is being taken to improve it, from the Ministry of Health and the Scottish Board of Health, and by means of a questionnaire sent to all colliery companies. We print in Appendix No. 35, a memorandum that has been prepared, embodying the principal points in that information.

There are no general statistics relating to miners' housing as such. The material that is available relates to districts in which over 20 per cent. of the population are employed in mines. Some qualification also has to be made in respect of the standard of "overcrowding" that has long been adopted in the official statistics on this subject. Under that standard, wherever a family are living more than two persons to a room, they are regarded as being under conditions of overcrowding. In Scotland, however, in the mining villages, as in the agricultural villages, the houses often consist of one storey, usually divided into two rooms, which are very large in comparison with the rooms in the ordinary English or Welsh working-class house; sometimes there is a third smaller room; occasionally, on the other hand, the house consists of only one large room. If, in a cottage of two large rooms and one smaller one, there were living, for example, a family of seven persons—the parents and an infant sleeping in one room, two girls in the second, and two boys in the third—this, according to the English standard, would be regarded statistically as a case of overcrowding. But it is certain that the family would not so regard it themselves, nor would the general opinion of the locality. Similar considerations arise in the older villages in Northumberland and Durham, where the customs as to housing are much the same.

The fact remains, however, that the information clearly shows that the housing conditions of the miners, particularly in those two counties and in Scotland, are often very bad. In Northumberland and Durham the miners appear to be no worse off in this respect than the rest of the population. In Scotland and in Lancashire they are worse off. In almost all districts, and particularly in some parts of South Wales, there are considerable numbers of houses which have been condemned as unfit for habitation, but which remain occupied by the miners, since there is no immediate prospect of their being replaced by better ones, and the closing of them would merely increase the existing overcrowding.

Between a quarter and a third of the total number of miners live in houses owned by the collieries. There are probably 180,000 such houses; 68,000 of these are let free of rent; almost

* See Appendix No. 31.

all being in Northumberland and Durham ; of the rest 561 are in South Wales. In Northumberland and Durham, it is the custom where houses are not provided free, to pay an allowance as an addition to wages ; allowances of about 10d. per shift, or of about 4s. 8d. per week, were made in 1925 to 70,000 workers. The free houses and allowances are given only to heads of families.

The average rent, including rates, of colliery-owned houses let at a rental (some of which may be occupied by under officials), was, in 1913, 4s. 2d. ; and for houses owned by the same companies in 1925, 6s. 8d., an increase of 60 per cent. The average rent, including rates, of houses built since the war is 11s. 2d. For colliery-owned houses of both classes, pre-war and post-war, the average rent, with rates, is now 7s. 3d., an increase of 74 per cent. above the pre-war figure.

In the districts of England and Wales where the mining population exceeded 20 per cent. of the whole, a survey, made in 1919, showed that, if overcrowding was to be avoided, unfit houses replaced, and some provision made for industrial development, 186,000 new houses would be needed. In those districts about 59,000 have so far been built since the war. Of these, some 36,000 have been provided by Local Authorities, 18,000 by State-assisted private enterprise, and 5,000 by colliery companies and Public Utility Societies with State assistance. Of these last, the great majority have been built by the Industrial Housing Association, a company established for the purpose of constructing houses in colliery districts, the capital of which is provided, partly by the colliery companies, and partly by loan from the Public Works Loan Commissioners.

Up to 1st October, 1925, 8,073 houses had been built, or were about to be built by this Association. Since then a considerable number of additional houses have been completed or are under construction.

In Scotland, a survey made at the same time showed, in districts where 20 per cent. of the population were engaged in mining, a shortage of 17,635 houses. By October, 1925, in those districts 14,714 houses had been built with State assistance by Local Authorities and others (including colliery companies), and without such assistance by colliery companies. Probably, however, the standard of accommodation, on which the estimate of the shortage was based, was lower than that adopted in England and Wales, and the figures of new construction do not necessarily lead to the conclusion that the present situation is now relatively better in Scotland. Of these new houses, 10,144 have been provided by Local Authorities, 2,927 by colliery companies, and 1,643 by other private enterprise.

It will be borne in mind, that while these facts give a useful indication of what is being done with respect to the housing of miners, these districts contain large populations who are not miners, and, on the other hand, very many miners live in districts other than these.

With regard to sanitation and overcrowding, it appears that the Local Authorities are alive to their responsibilities, and do their best to cope with the situation, within the limits set by the shortage in the present number of houses and the insufficiency, as a rule, of the new provision.

So far as the existing mining villages are concerned, we consider that these activities of the Local Authorities should, of course, continue, and that every practicable endeavour should be made, under the provisions of the present Housing Acts, to make good the shortage.

With regard to new collieries, we observe with great satisfaction the efforts that are being made, in a number of instances, to provide a sufficiency of accommodation, and of a proper standard. We consider it essential that such provision should be made in all cases, whenever new collieries are established, so that the errors and neglect of the past should not be repeated in the future. In the chapter dealing with Royalties we have made a definite recommendation to this end.

We recognise that if the conditions of the industry should necessitate the transfer, in the near future, of considerable numbers of workers from one district to another, serious difficulties connected with housing may arise. We recur to this matter in the chapter on The Present Situation.

CHAPTER XVIII.—WELFARE.

One of the most gratifying developments of recent years has been the establishment of the Miners' Welfare Fund.

This Fund was created under the Mining Industry Act, 1920, for "purposes connected with the social well-being, recreation, and conditions of living of workers in or about coal mines, and with mining education and research." Its income is derived from a levy of one penny per ton of output, yielding about £1,000,000 a year. It was created originally for a period of five and a half years, the first contribution in March, 1921, being for the last six months of 1920. It was extended for a further five years by the Mining Industry (Welfare Fund) Act, 1925.

To help in meeting the requirements of the higher standard of life which now obtains, in the country generally and among the miners certainly not less than among others, the Welfare Fund plays a most useful part.

The allocation of the Fund, subject to the approval of the Secretary for Mines, is in the hands of a Central Committee, which is appointed by the Secretary for Mines, and includes members having practical experience of the industry. In all matters of a local or district character (about four-fifths of the whole) the Committee works mainly through Joint District Committees, representative of the mineowners and the colliery workers in the several districts.

About 67 per cent. of the amounts allocated from the district funds have been for purposes connected with recreation, and 31 per cent. for purposes connected with health, including pithead baths. Of the expenditure on recreation the greater part has been devoted to the provision of institutes and of sports grounds. To the end of 1925 over £2,000,000 had been allocated for these and similar purposes. The result has been the provision on a large scale of valuable opportunities for recreation both for children and for adults; and it is hoped that such schemes will help to relieve the drabness and discomfort of many mining districts and villages.

In most cases the schemes themselves are managed by local committees, but in some they have been undertaken with the assistance of the local authority, or when completed have been handed over to the local authority for organisation and maintenance.

Under the head of health is included a large expenditure from the Welfare Fund on convalescent homes. These affect housing in so far as, in cases of illness, they remove the convalescents from dwellings that may be already overcrowded, and obviate the extra strain involved in the attempt to provide space and quiet for one member of the family at the expense of the rest. In four districts the greater part of the Fund available for each from the contributions of the first five years is being applied for this purpose.

A sum of £500,000 has been allocated, under the advice of the Safety in Mines Research Board, to finance research connected with safety in mines ; and another sum of like amount has been set aside for improving and increasing facilities for higher technical education in mining communities.

Pithead Baths : Existing Provision.

One matter which, in our view is of great importance, and for which greater provision should be made, is the supply of baths at the pithead. To this we have given close attention.

The movement for the establishment at the pithead of facilities for taking baths and drying clothes has proceeded for many years, and the matter has on several occasions engaged the attention of Parliament.

The Coal Mines Act of 1911 provided that if, on a ballot, at least two-thirds of those workmen at any mine who are engaged in " dirty " occupations express themselves in favour of baths and drying rooms and undertake to pay half the cost of maintenance, the mineowner shall forthwith provide such accommodation, provided that the total cost of maintenance (including interest on capital expenditure) does not exceed 3d. per week for each workman liable to contribute. The insertion of this limit made the section a dead letter, since under post-war conditions 3d. a week would barely cover interest on the capital cost of erection alone.

In 1919 all the four Final Reports of the Coal Industry Commission recommended that suitable bathing facilities should be provided, and, when the Miners' Welfare Fund was established, pithead baths were recognised as one of the purposes to which the fund might be applied. It was enacted that, if grants were made from the fund to schemes for the provision of baths promoted under Section 77 of the Coal Mines Act, 1911, interest on the amount of the grant would not be taken into account in calculating the cost of maintenance ; but, as this modification still failed to bring the estimated cost of maintenance below 3d. per week (even if the fund were to meet the whole capital cost), Section 77 of the Coal Mines Act remains inoperative, so far as any obligation on the colliery owners is concerned.

It has been the policy of the Miners' Welfare Committee, while regarding the general establishment of pithead baths as being beyond their scope, to encourage their provision in selected places as examples, in the hope of stimulating their adoption elsewhere. In 1924, however, this policy was temporarily suspended in consequence of a Bill introduced by the Labour Government, which required every owner within a period of three years to provide sufficient and suitable bathing accommodation and drying facilities at the pithead. Powers were reserved for the

Secretary for Mines to exempt any mine where, owing to lack of water or for other reasons, it was not reasonably practicable to provide baths, or where the coal seams were likely to be exhausted in a short time. This Bill lapsed before being read a second time, in consequence of the dissolution of Parliament. In the expectation that, if the Bill were passed, provision would be made for the expenditure involved from sources outside the Welfare Fund, the Committee of the Fund suspended meantime the making of allocations for such purposes. They have since reverted to their previous policy.

The Report for 1925 of the Miners' Welfare Committee states that nearly £116,000, for 17 installations, had been allocated from the fund for pithead baths by the end of that year. (A report on one of these schemes is given in Appendix No. 34.) Information as to the provision from other sources is not available for a later date than the 31st December, 1924, but it appears that at that date only some 30 pits, had been equipped, or were about to be equipped, with bath accommodation for the miners, and about 20 more with accommodation for overmen, firemen, deputies and examiners. Ten installations are described as being used by a daily average of over 400 workmen, and four others by a daily average exceeding 100. On the basis of ten men to one shower-bath, the accommodation so far provided is sufficient for a maximum of 20,000 men, or roughly 2 per cent. of the total number employed.

Practice in other Countries.

It is of much interest to note that in the principal coal-mining countries of Europe the provision of pithead baths at coal mines is usually compulsory. In Germany such facilities have been in use at various coal mines for more than a quarter of a century. The law relating to the provision of pithead baths, and to their use by the miners, varies to some extent in the different German States, but both are for the most part obligatory; their use was made compulsory in Westphalia in 1900. In all cases the cost of providing and maintaining the installations is borne entirely by the owners, and in some of the States where the use of the baths is optional the employers sometimes make obligatory bathing a condition of employment. In Belgium the provision of baths was made obligatory by a Royal Decree which came into operation in 1913, but baths had been installed at some mines long before that date. The use of the baths is optional. In France, also, the provision of bathing accommodation is compulsory in the larger mines, its use by the men being optional. In the United States of America bathing installations are not generally compulsory, but the provision of wash and change houses is required by law in Arizona, Illinois, Indiana, Kansas, Montana, Oklahoma and Pennsylvania. In other States the provision is conditional on the representation of a requisite proportion of the workmen. Some of the best baths are to be found in States which have

no compulsory law. In New Zealand the provision of bathing accommodation is compulsory in mines employing more than 50 men, if 30 per cent. request it, the entire cost being a charge on the industry. Use by the men is optional, but is general where the accommodation is adequate.

Advantages of Pithead Baths.

The provision of pithead baths is attended with striking advantages, not only to the comfort and health of the miner himself, but also to the comfort of his wife and family. The benefit is the greater if, as often happens, there is more than one worker in the household, especially if they work on different shifts. Even if a bathroom is provided in the miner's house, as is usually the case in houses recently built—a small proportion, however, of the whole—this is far from meeting the need. The case is well expressed in the following extract from a memorandum submitted to us on behalf of the Colliery Under Managers' and Overmen's Association of Scotland:—

“ We believe that it would be of great assistance in solving at least some of the problems confronting the miner's wife if baths were erected at the pitheads, so that the men could leave all the dirt incidental to their occupation behind them when their day's work is done Not so very long ago, practically all the miners lived in villages close to the collieries, and had only a short distance to travel to their homes after they reached the surface. Nowadays it is becoming more and more common for the miner to travel by train, tram or bus several miles to and from his work. It would add much to his comfort if he could leave his working clothes at the mine, bath himself and enter one of these conveyances clad in clean dry clothes. From a health point of view it would also be a great advantage. If a man is working a wet seam and has to travel a distance of several miles to his home, before he can get rid of his wet and dirty clothes, especially during the winter months, he is liable to catch a chill that may have very serious consequences. Even in dry mines, more especially in the warmer and deeper mines, at the end of a hard day's work the clothes of the miner will be damp, and uncomfortable to sit in; if he has to travel a long way to his home the consequences may be serious and, as noted above, his clothes may require to be dried at the fire in the living room, or, as is too frequently the case, the fire of the only room in the house. It would add to the self-respect of the miner if, when he has to travel from his work in a public conveyance, he could enter it clean and decently dressed like other people. It would add greatly to his home comfort and that of his wife and children if he could leave behind him all the filth and dirt incidental to his employment.”

Dr. J. S. Haldane, President of the Institution of Mining Engineers and Chairman of the Health Advisory Committee of the Secretary for Mines, giving evidence on behalf of the Institute of Mining Engineers, said:—“ I think when a miner goes home with dirty clothes, and so on, it puts a strain on his wife and his family which is not desirable, and I think it is very undesirable that miners should come away from a pit like a horde of well rather

doubtful looking characters. They are all black. You might imagine they were a lot of wild men, but if you know them you know they are the best of people. . . And the public do not like this, they do not like miners getting into trams and trains ; they think they are dangerous characters, which is an entire mistake. It tends to cut off the miner from the rest of society. . . I think it tends to lower the standard of the miner's home to put all this work on the wife."*

We attach weight to considerations of this kind ; for it is important that the conditions of the industry should be such as to enable men, of the standard of education and intelligence of the mining population of the present generation, to engage in it without loss of self-respect, and without incurring that sense of dissatisfaction and discontent which a lessening of self-respect inevitably involves.

A further point to be borne in mind is the undesirable moral effect on miners' children, which may sometimes result from the practice of general bathing in the living room ; the effect on their health of being frequently exposed to a steamy atmosphere ; the many cases of young children falling into tubs of scalding water ; and the offensive smell of the drying clothes in the cramped accommodation of a miner's home.

Against all these advantages the only objection we have been able to trace, apart from the question of finance and the difficulty of overcoming prejudice on the part of the older workmen, is that the men have to spend time changing their clothes on arrival at the pit. There is no evidence, however, in the case of existing baths, that this is regarded as a serious drawback.

Effect upon Health.

It has sometimes been urged that men are liable to catch colds when they go too soon into the open air after a hot bath ; and it does appear to have been the case that this result has followed when baths are first installed. Experience as to the right temperatures soon ends this disadvantage, and instruction in advance could easily obviate it. In general we are satisfied that no ill effects on health are to be apprehended. Dr. J. S. Haldane, in his evidence, expressed a very definite opinion in this sense.

We have also addressed a special inquiry on this point, through the Ministry of Health and the Scottish Board of Health, to the medical men who attend the miners in places where baths have already been established. Their replies, which are printed in Appendix No. 33, are unanimous and entirely favourable.

A further point of interest in this connection is mentioned in the recent report by Professor Collis and Dr. Llewellyn on the miners' diseases known as "beat knee," "beat hand," and "beat

* Haldane, Q. 12343.

elbow." It is there recommended that, to reduce the incidence of these diseases, increased attention should be paid to the cleanliness of the skin, particularly of men working in thin seams.

Conclusion.

The existence in this country of several baths on a large scale for a period of years has provided sufficient experience on which to form a considered judgment. We have ourselves visited two of these baths. They comprised, in each case, a large and lofty hall surrounded by a number of cubicles of glazed brick. In each of these cubicles was a shower bath, with hot and cold water supplies under the control of the user. Suspended from pulleys in the roof of the hall were a large number of wooden hangers attached to cords. Each man had his own hanger, was able to lower it from its position, place on it his home clothes or working clothes, as the case might be, and return it to its position. The clothes were hung at different levels and were not in contact with each other. The number of hangers was considerably larger than that of cubicles, since several men in each shift follow one another in each cubicle, and there is more than one shift in the day. We were informed that to a great extent demand, in this matter, had followed supply. At first only a minority of the men realised the advantages to be derived from the baths, but their appreciation grew rapidly, and any proposal now to close the baths would be met by the strongest opposition in every place where they had been established. Indeed, it is probable that extensions will be necessary in localities where the accommodation is not sufficient for the whole number of men employed.

We are satisfied that the movement for the provision of pithead baths is fully justified, and that it is a matter of real importance to secure their establishment throughout the coalfields. We are convinced that the effect upon the health and comfort of the miners, upon the well-being of their wives and families, and therefore upon the general contentedness of the population, would be so considerable as to make this a subject which should engage immediate and effective attention.

The question of capital cost, however, constitutes an important problem. The Miners' Welfare Committee state in their Fourth Report that, excluding the value of the sites (which in the case of allocations from the Miners' Welfare Fund have in nearly every case been provided free of charge by the colliery companies), the present-day cost of pithead bath schemes amounts to approximately £109 per cubicle; or (on the basis laid down in the Statutory Regulations on the subject, that one bath shall be provided for every six men of the largest shift) to roughly £11 per man accommodated. If therefore baths were to be established universally, and if multiple shifts were worked no more than now, the total cost would, on this estimate, be considerably in excess of £10,000,000.

It may be added that, in their Second Report, the Committee suggest that some saving in cost might be effected if the Regulations were made more elastic. In so far as the system of double shifts is extended, the number of separate cubicles to be provided at the mines would be diminished, as each cubicle would be used in the twenty-four hours by a larger number of men. It is undesirable, moreover, that expenditure should be incurred at mines which have only a short working life still in prospect. There can be no question in this country of making the use of the baths compulsory, as it is in Germany; and in some localities the willingness on the part of the men to use the baths may be slow in developing. It is neither necessary, nor for financial reasons is it practicable, that the provision should be universal or simultaneous. We consider that if a sum of £4,000,000 were provided over a period of 10 years, all the more urgent necessities of the case would be met, and the subject could be reviewed from time to time in the light of the experience that had been gained.

Pithead baths are clearly a part of the necessary equipment of the collieries, and the obligation should properly rest, in this country as it rests in others, upon the colliery proprietors. In the present economic condition of the industry, however, we consider that the Welfare Fund should bear the cost; but as the claims upon its present resources are very many, and can barely be met, we recommend that its income should be expanded for this purpose. This, we consider, can properly be done by requiring a contribution to be made to the fund by the mineral owners.

In view of the fact that their income from royalties is largely dependent upon the labour of the miners, it is legitimate to require them to join in the measures which are regarded as necessary for the miners' well-being. A mineral owner has a moral obligation to aid the well-being of the population that works his minerals, in the same way that a landowner has a moral obligation towards the population that works on his estate.

It must be borne in mind, however, that mineral rights are already charged special taxation to the extent of 5 per cent. of the receipts, or an average of about one farthing a ton. But for this fact, we should have recommended an annual charge upon royalties, for the benefit of the Welfare Fund, of an average of one halfpenny per ton, to supplement the one penny per ton now contributed by the mineowners and the miners.

In the circumstances, we propose an additional charge of 5 per cent. upon royalties, averaging one farthing per ton, to be paid into the Welfare Fund. The yield will be about £250,000 a year.

The more prosperous collieries may be ready to defray a part of the remaining cost as well as to provide the land that is required. The provision of any balance that may be needed should be

considered by the Committee of the Welfare Fund in the same way as other demands upon their resources. They would bear in mind that the contributions to the Welfare Fund cease after five years unless further extended.

The Committee should be asked to impose upon the districts, as a condition of this increase in their revenue, the duty of encouraging the rapid provision of pithead baths at all collieries with a probable life of not less than 15 years.

CHAPTER XIX.—ASSOCIATION OF THE WORKERS.

There are a number of questions, directly affecting the interests of the workers, in the regulation of which their representatives have a voice. Their participation rests sometimes upon a statutory right, sometimes upon voluntary agreements with the employers.

Statutory Rights to Participation.

In the first category is the right, conferred as long ago as 1887, for the election of checkweighers, representative of the miners, to protect the interests of the pieceworkers with respect to the payment for the minerals that are won.

Under the Coal Mines Act of 1911, any workman who alleges incompetence, gross negligence or misconduct, against a colliery manager or under-manager, has the right to report the matter to the Secretary for Mines, who has the power to hold a public inquiry into the allegation.

The same Act provides that the workers shall be represented on an equal footing with the owners and managers on the Board which regulates the examinations for mining certificates of competency.

Under another section of the Act of 1911, repeating earlier legislation, the workmen employed in a mine have the right of appointing two of their number to inspect the mine once at least in each month, and the report of their inspection must be forwarded to the Mines Inspector. Over 5,000 such inspections were made in 1924, almost all of them in Northumberland and Durham or in South Wales.

Under another section of the same Act, if a majority of the workmen employed in the mine are of the opinion that the general regulations enforced in respect to it, or the special regulations, ought to be altered or modified, the Secretary for Mines is under the obligation to consider their suggestions and to take such action as, after inquiry, may seem desirable.

There are Joint District Boards, established under the Minimum Wage Act, 1912, for the settlement of minimum rates of wages and rules to govern their payment.

The Mining Industry Act of 1920 established an Advisory Committee for coal and the coal industry to co-operate with the Mines Department. Among its members are four representatives of workers in or about coal mines and three representatives of workers in other industries.

The Central Welfare Fund, to which we have referred in the previous chapter, established by the same Act, is also under the control of a Committee, on which the Miners' Federation, as well as the Mining Association, have representatives.

Non-Statutory Participation.

The arrangements that have been made on a voluntary footing with the employers have provided for the establishment of Conciliation Boards for the determination of wages and other matters of joint interest, in almost all the coalfields of the country. Joint committees have also been established, in each district, for the administration of the Welfare Fund, and for the management of each particular welfare scheme. At some pits, but not, apparently, at a large proportion, standing joint committees have been brought into existence for the discussion of a variety of questions; at others informal committees are appointed from time to time to deal with particular matters.

It is the practice of the Mines Department (as it was formerly of the Mines Department of the Home Office) to place representatives of the miners on committees set up to consider special aspects of health and safety problems. There are, for instance, representatives of the men on the committees that are now sitting to consider the support of workings in mines, rescue regulations and water dangers. The Safety in Mines Research Board also contains a representative of the miners.

Opportunities for Advancement.

But the participation of the miners in the working of the industry may take other forms besides membership of committees. From the evidence given to us on behalf of the National Association of Colliery Managers, and of the General Federation of Firemen's Examiners' and Deputies' Associations, it is clear that the mining industry offers great opportunities for the worker to obtain promotion, certainly greater than prevails in industry generally. We were told that over 50 per cent. of the present colliery managers started as working miners, and that practically all the deputies, firemen and examiners had been working miners. This is no doubt partly due to the conditions which have to be fulfilled before a man can obtain a certificate of competency, but it shows that the industry offers considerable opportunity to the workman who is willing to qualify for positions of responsibility.

Part II of the Mining Industry Act, 1920.

All the four reports of the Coal Industry Commission of 1919 favoured the extension of the machinery of joint committees, and its being placed on a permanent and statutory footing. Parliament accepted this recommendation, and embodied in the Mining Industry Act of 1920 a number of sections, constituting Part II of the Act, which provided for the establishment of a series of bodies, each generally representative of the employers and employed.

The Act provided for a pit committee at every coal mine, other than the smallest, where a majority of the workers, ascertained by ballot, resolved in favour of that step. In each district there

was to be a district committee. Certain of the districts were to be grouped in areas, each of which should again possess its joint board; and, finally, there was to be a national board, representative of the industry as a whole. The functions of the pit committee would be to discuss and make recommendations with respect to the safety, health and welfare of the workers, the maintenance and increase of output, disputes relating to wages and other matters, and certain minor subjects. The district and area and national bodies were to have corresponding functions.

A section of the Act provided that if at the expiration of one year (which ended on the 16th August, 1921) the scheme had been rendered abortive through the failure of those entitled to do so to appoint representatives to the various boards and committees, that part of the Act should lapse, unless Parliament otherwise determined.

The Miners' Federation, intent upon securing a measure of nationalisation, were unwilling to accept anything short of it, and gave notice of their refusal to participate in the scheme. In August, 1921, however, a few days before the expiry of the year, they adopted a different policy, and signified their acceptance; but the owners, who at first had been ready to work the proposals as embodied in the Statute, then declared their unwillingness to do so, and Parliament having declined to extend the period of a year, Part II of the Act of 1920 ceased to have effect.

We consider that the general purpose of the scheme was excellent. In our judgment, however, where it is a question of the participation of different bodies for a common purpose it is far better, wherever possible, to leave the arrangement of their method to the voluntary action of the parties themselves. The result is more likely to suit the needs of the case, and to promote a friendly spirit in the working, than the compulsion of an Act of Parliament and the rigidity of departmental regulations. But there are already, throughout almost the whole of the country, long-established joint boards in the districts; and the central committees of the employers' and the miners' organisations have been accustomed for some years to discuss together questions of common interest. We see no reason to suggest any interference with this machinery, the spontaneous creation of the industry itself.

Pit Committees.

We should have wished to express a similar view with regard to pit committees, but we fear that, unless some outside authority intervenes, the attitude of a large proportion of the mineowners and managers would prevent any substantial advance being made upon the present position. So far as this portion of Part II of the Act of 1920 is concerned, we regret that it was never put into effect, and we recommend that steps should now be taken to revive it.

We believe that its operation would lead to certain concrete advantages. We think it most probable that in very many cases the workers could assist the management, if they were brought into consultation, in many practical details with respect to which they are expert. The pit committees would be likely to stimulate production, and in other ways to promote the best interest of the undertaking, from the success of which the workers derive their livelihood. They should furnish a valuable opportunity for the management and the workpeople to get into personal touch, and more fully to understand each other's difficulties. We have heard no suggestion that, in the many matters mentioned above in which the workers now have a right of participation, there has been any abuse of the functions conferred upon them, or that any untoward results have followed. The experience of the past justifies a further extension.

Apart from the concrete advantages which are likely to ensue, the establishment of the pit committees, contemplated by Part II of the Act of 1920, would go far to removing the sense of exclusion, which undoubtedly is one of the principal grievances that cause discontent and unrest in the minds of the workers. Among the miners there is a strong corporate spirit, stronger perhaps than among any other class of workpeople. This is due partly to the conditions of their work, which involve a very large degree of mutual dependence and helpfulness, often in circumstances of danger; and partly to the fact that the locality in which their work has to be carried on involves, as a rule, the growth of separate villages for the workers; they therefore form a homogeneous community and have the fullest opportunities for common action. This corporate spirit, rightly directed, has been in the past, and may be increasingly in the future, of great benefit to the industry as a whole. We consider that the machinery proposed would provide it with a suitable method of application.

The objections that may be raised to the proposal do not, in our opinion, contain much substance. It is thought by some that the pit committees would be a centre of friction, and that they are more likely to be a source of illwill than of mutual understanding. We do not believe that this need be the case if they are tactfully handled by the mine managers; and we regard a capacity to work on good terms with the other members of a joint committee as one of the principal qualifications for a position involving industrial relationship with a large body of men.

It is sometimes suggested, again, that the system would lend itself to the assumption by the committees of the functions of management, that the responsibility of the manager would be fatally weakened, and that he would be left in a position in which he would be unable to fulfil the duties, laid upon him by Statute, for securing the safety and the proper working of the mine. Ample safeguards may, in our view, be provided against this danger. In the first place, it was definitely prescribed, in the regulations that were made with a view to the execution of

Part II of the Act of 1920, that the responsibility of the manager should not be impaired, a declaration that might perhaps with advantage be inserted in the new Statute itself that would need to be enacted. To this principle no objection will be raised by the Miners' Federation, for in the proposals which they made to us in their Final Memorandum* it is definitely approved. That memorandum, it is true, dealt with the conduct of the mines under a system of nationalisation, but the principle, if a sound one, cannot be limited to that system. In the second place, the functions that would devolve upon the committees were defined in the Act, and there would be no authority to pass beyond them. We consider that cases of discipline should not be subject to their review, and we understand that this was the intention of the Act. The maintenance of discipline is essential to safety and to good management, and our recommendations are not intended to detract in any way from the authority of the manager in that matter. Thirdly, it was provided in the Act that no recommendations of the committees were to have validity unless a majority of each of the sides represented concurred in them.

In these circumstances we feel convinced that the danger of the proposed machinery being diverted from its proper use is a slight one, and that the risk is well worth incurring in view of the large advantages to be gained.

The Act of 1920 did not provide for mandatory force to be given to the decisions of pit committees: nor, in the event of the pit committee failing to reach agreement, did the Regulations under the Act make any effective addition to the means which the workmen's side already had of carrying a question to the District body, through their Trade Union organisation. The fact, therefore, that our present proposals are limited to the pit committees, and do not affect any higher authorities, does not involve any smaller powers being conferred upon pit committees than would in effect have been exercised by them in accordance with the intentions of the Act of 1920.

We recommend that, after some experience of the working of the system, the question should be submitted to further review, in order to consider whether that experience had shown any necessity for conferring a statutory position and mandatory powers, subject to the concurrence of the Mines Department, upon district committees.

We would suggest that the regulations for putting the machinery into operation should allow as much elasticity as possible. Sometimes the committees would be of a more formal character, and sometimes of less. In general, questions should be left to be settled so far as possible by the industry itself. It may perhaps be found advisable to submit the regulations, when drafted, to the Advisory Committee of the Mines Department, which is fully representative of all the interests concerned.

* Tawney, No. 5, para. 17.

We would express also the opinion that when the pit committees have come into being, the last excuse for the so-called "lightning-strikes" would disappear. These sudden withdrawals of labour, without notice and without discussion of the points at issue, not only cause financial loss both to the employers and to the miners, but also embitter the relations between them. Our recommendation in favour of the general establishment of joint pit committees is intended to provide a machinery which should obviate such stoppages. If they still continued, it would have failed of part at least of its purpose, and the maintenance of the committees would have to be considered afresh.

Suggestions Schemes.

Finally, we would draw the attention both of mine-owners and of miners to the system which has been in vogue for some years in the General Post Office and in other industries, for inviting and investigating suggestions from the staff for improvements in working methods. In the Post Office there has been established a standing Awards Committee. All grades of the staff, below the supervising officers, are invited to forward suggestions to that committee, and those that are adopted receive a money reward; a certain number that are not adopted, but are considered specially meritorious, are also rewarded. During the period of 18 years in which this scheme has been in operation, nearly 9,000 suggestions have been received, of which 1,300 have been adopted. It cannot be doubted that, in the total, a considerable improvement in working methods has resulted. Similar schemes are in operation in a number of important companies and industrial firms. Although the greater proportion of the suggestions that are received are not found to be practicable or necessary, those that are in fact adopted are numerous, and there is a consensus of opinion that the schemes are useful.

We would suggest that the mining industry would be well advised to consider the adoption of a similar procedure.

We would point out that it is not sufficient to express a general willingness to receive suggestions from the workers and to adopt them when they are of value, but that it is necessary to establish a definite system for the receipt and consideration of such suggestions, to pay adequate money rewards for those that are of use, and to make widely known among the staff the establishment of the system and the opportunities that it affords.

CHAPTER XX.—PROFITS.

Profits in the mining industry, as in other industries, may be measured by reference to one of two distinct standards. Sometimes the difference is taken between the price received for a given quantity of coal and the costs of producing it, usually divided into "wages costs" and "other costs"; this is expressed as so many pence or shillings per ton; it may be reckoned either per ton of coal raised or per ton commercially disposable, that is, after excluding saleable coal consumed by the mine itself or the miners. Sometimes profit is measured in relation to the capital invested; it means distributable profit, whether the distribution takes the form of dividend on capital or of issue of bonus shares against accumulated reserves.

Measurement of profit in relation to capital in the mining industry as a whole, is a matter of extreme difficulty. It is impossible to get either a satisfactory definition or a satisfactory estimate of the capital against which the profit is to be measured. We are not in a position either materially to add to or to criticise the estimate submitted by Sir Josiah Stamp to the Commission of 1919 that, before the war, the average return to capital in coal mining was rather under 9 per cent., taking into account the specific incidents, and that this was low relatively to other industries. It is probably fair to regard mining as a highly speculative industry in which the possibility of obtaining a few large prizes was enough to attract capital, although the losses or small profits of the majority made the average profit appear in Sir Josiah's words "extraordinarily low."

The second way of measuring profits—in relation to each ton of coal, and to the wages earned in producing that ton—leads to more positive results. The following table sets out for quinquennial periods up to the war, for the period of war and control and for each year thereafter, the annual tonnage, the total profits, and the profits and wages per ton commercially disposable. In the last two columns, the effect of changes in the value of money is eliminated so far as possible, the actual profits and wages being corrected by use of the *Statist* index of wholesale prices; these columns give the real value of profits and wages per ton at the prices ruling in the five years 1909–13. The figures relating to wages have been taken from the evidence submitted to the Commission by Mr. Gowers. The sources of the other figures are described in a Report by Mr. Cutforth on Capital and Profits in Coal Mining Industry, which is printed in Appendix No. 38; the table itself is adapted from a table printed in that Report, by giving profits and wages per ton commercially disposable rather than by tonnage raised.

Table 21.
Profits of Colliery Working 1889 to 1925.

Period.	Annual Tonnage disposable commercially (million tons). (1)	Annual Profits Earned.		Wages, shillings per ton. (4)	Profits, shillings per ton at prices of 1909-13. (5)	Wages, shillings per ton at prices of 1909-13. (6)
		Total (million £). (2)	Shillings per ton. (3)			
1889-1893 ..	162	7.4	0.91	5.04	1.03	5.73
1894-1898 ..	178	4.4	0.49	—	0.63	—
1899-1903 ..	205	16.0	1.56	5.98	1.79	6.87
1904-1908 ..	228	11.5	1.01	—	1.12	—
1909-1913 ..	246	12.8	1.04	5.99	1.04	5.99
1914-1921 ..	212	22.7	2.14	14.49	1.05	7.14
1922 ..	227	11.0	0.97	12.15	0.60	7.45
1923 ..	253	27.5	2.17	12.35	1.36	7.72
1924 ..	244	14.3	1.17	13.24	0.68	7.65
1925 (6 months)	226	(loss) 2.1	(loss) 0.19	12.99	(loss) 0.11	7.51
1922-1925 ..	237	12.7	1.07	12.69	0.64	7.60

For each year from 1917 to 1925, the reduction on account of Mine Consumption and Miners' Coal, in order to convert tonnage raised into tonnage commercially disposable, has been based on the returns furnished to the Department for the year concerned. For the periods between 1889 and 1916 the proportion of output taken by Mine Consumption and Miners' Coal is based on the average of these items during the period 1922 to 1925. During recent years the proportion of Mine Consumption to total output has decreased as compared with pre-war while the proportion of Miners' Coal has increased. It has been assumed in this table that these tendencies counterbalance one another, and that the combined items accounted for the same proportion before the war as at the present time.

It will be seen, in the first instance, how closely the profits accord with the figure given by Sir Arthur Lowes Dickinson to the Commission of 1919, of 1s. a ton as the normal profit of coal mining before the war.

In two periods (1899-1903 and 1914-21), the profit is exceptionally high, and in another (1894-98) it is exceptionally low. The mean profit per ton of the five periods from 1889 to 1913 is exactly a shilling at actual prices; at the prices of 1909-13, the mean profit is 1.12s. Wages, in the two periods other than 1899-1903 for which they can be given, show much the same relation to profits. Something like 6s. a ton for wages and just over 1s. a ton for profits appears a well-established proportion, sufficiently close to the proportion on which the mineowners under the 1921 agreement subsequently proposed to divide the net proceeds with labour.

The four years since decontrol show a striking change of proportions. Wages per ton have more than doubled and are more than 12s. 8d. per ton in the four years taken together. Profits remain at just over 1s. a ton. In place of being more than one-sixth they are barely one-twelfth of wages. If we look, not at the money wages and profits, but at wages and profits reduced to 1909-13 prices, as in the last two columns, we see that while real wages per ton have increased as from 5.99s. to 7.60s., the real value of profits has fallen as from 1.04s. to .64s.

The four years in question, with the exception of 1923 and part of 1924, are a time of depression in which the proportion of profit to wages would naturally fall. Nor is it unreasonable that the proportion of profit to wages should fall, since wages costs per ton have been raised by the reduction of working hours. The ratio of 15 for profits to 85 for wages established by the 1921 agreement, in accordance with pre-war experience, was in fact abandoned under the 1924 agreement, in favour of a proportion of 13 to 87. With a wages cost of about 13s. a ton, as in 1925, the new proportion would mean 1s. 11½d. a ton for profits; the latter figure is curiously near to what would be reached by adding to the pre-war profit of 1·12s. per ton about 70 per cent. for the fall in the value of money between 1909-13 and 1925.

These calculations suggest: first, that under post-war conditions the ratio of 13 for profits to 87 for wages as established by the agreement of 1924 is probably fairer than the proportion of 15 to 85 under the 1921 agreement; second, that if the average profit of just over 1s. a ton before the war was a fair one, something between 1s. 9d. and 2s. would be reasonable now. Such profits per ton would not mean that the real return to capital was as high as before the war, just as the doubling and more of wages per ton does not mean that the real wages of each miner are higher than before the war; more capital and more men are required to produce each ton owing to reduction of working hours. More capital per ton is required also in view of the increased expense of modern mining in deep pits with costly machinery.

Whether or not the average rate of profit before the war was the lowest that would secure the healthy development of the industry, we have no means of determining. The following points, however, seem to be well established:—

First, the profits per ton in the four years since de-control have in real value been well below the pre-war level, and though not below those recorded in a depressed period such as 1894-98, would not be sufficient as a permanency.

Second, owing to the large proportion that labour costs bear to the total costs of production, the sum allocated to profits must always be small in proportion to wages, and there is here no large margin out of which a substantial increase of wages could be effected.

Third, while profits on an average have been small, those of certain particular undertakings, both during the war and after the war, have been very large. These profits have either been left in the business as accumulated reserves or have been distributed as dividends or as bonus.

This is a reflection of the diversity of the industry, which, as stated elsewhere, regularly shows losses of 5s. per ton and profits of 5s. per ton at one and the same time in different mines. Such cases of extreme prosperity, occurring as they easily may at a time when wages generally are falling, readily strike the public

eye. A good deal of attention was given to them in one of the memoranda submitted by the Miners' Federation; the facts with regard to some of the companies there mentioned were investigated on our behalf by Mr. Cutforth. His report, printed in Appendix No. 38, deals with seven companies, chosen haphazard from among the most important and prosperous that were included in the long list submitted by the Miners' Federation. The following is a statement in which Mr. Cutforth summarises his deductions from this investigation.

- (1) The average annual rate (24½ per cent.) of "real" dividend paid, according to the Miners' Federation, by the seven companies (taken as a whole) on the Ordinary Share Capital is too high, being based on inaccurate information or inaccurate calculations. Moreover, in any case, such a percentage would not give a true indication of the measure of the companies' prosperity because—
 - (a) It does not take into account the capital (Debentures and Preference Shares) bearing low rates of interest and dividend.
 - (b) It disregards the accumulated "free" reserves which also represent capital employed in the business.
- (2) The average annual disclosed profits of the seven companies represented about 12 per cent. on the average capital employed as shown by the published accounts.

It is possible that the disclosed profits have been understated by reason, for example, of excessive depreciation allowances. Some addition would no doubt also have to be made to the figure in respect of Income Tax charged in arriving at the profits not being recouped by deduction from shareholders' dividends.

On the other hand, the capital employed may also have been under-stated by excessive depreciation allowances made both prior to and during the period reviewed.

- (3) The seven companies, taken as a whole, distributed in dividends and debenture interest, on average, about 9½ per cent. per annum on the capital employed as shown by the published accounts.

This figure of 9½ per cent. requires to be increased somewhat in order to allow for the fact that in most cases the dividends on the Ordinary Share Capital were paid free of Income Tax. The adjusted figure would then represent a rate of distribution subject to deduction in respect of Income Tax.

- (4) The excess of the profits earned over and above the distributions made to the debenture and share holders was retained in the businesses. It represents the amount by which the free reserves and undistributed balances on Profit and Loss Accounts had been increased during the periods reviewed.

Part of these free reserves were capitalised by issues of bonus shares. Such issues did not constitute a "watering" of capital.

The general conclusion is that these seven companies, during an average period of 15 years, on the whole of their capital made profits, including the profits dealt with by bonus share distributions, and those devoted to payment of income-tax before the distribution of dividends, which may be estimated to have amounted to about 14 per cent. The complexity of the matter renders it impossible to make an exact statement, but that figure roughly represents the truth. If the profits on the ordinary shares alone are considered, the rate would be higher, but still much less than the 24½ per cent. suggested by the Miners' Federation.

Such profits are not enormous, but they are high. They are not so general that anything taken from them could materially affect the wages even of a district, but they may be conspicuous enough to cause resentment and a sense of injustice over a yet wider area. Actually, in mining as in other industries the shareholders are often a very large body of persons of moderate means; the local pit attracts the savings of those who live near it. There is every ground for adding to these shareholders, not merely miners who may buy and pay for shares when offered to them, but also, whenever special prosperity is experienced by an undertaking, miners who have contributed to that prosperity; such men would receive shares without payment, in respect of their service. We have recommended accordingly, in another chapter when dealing with wages, the establishment of profit-sharing schemes for colliery undertakings.

PART IV.—CONCLUSION.**CHAPTER XXI.—THE PRESENT SITUATION.**

The essential facts of the present situation are these :—

1. Compared with the pre-war period, the home demand for coal is stationary. Economies in the methods of burning coal combined with depression in the iron and steel, and ship-building trades, have counter-balanced the effects of growth of population and of industrial progress.

2. The foreign demand was $7\frac{1}{2}$ per cent. less in 1924 than in 1909–13. In 1925 it was 22 per cent. less. There has been in 1925 a serious depression in the industry in almost all the coal-producing countries of Europe. The principal causes are—the depressed condition of a number of staple industries in many parts of the continent, and the almost complete cessation in the demand for imported coal in Russia ; the increased use of oil for shipping ; the large increase in the output of lignite in Germany ; and the working of new or extended coalfields in certain continental countries.

3. A great new coalfield has been developed in South Yorkshire and Nottinghamshire. From this field about 11 million tons a year are now being produced, and before long the production will be 20 million tons.

4. With a stationary demand at home and a reduced demand abroad, the number of men employed in the coal-mines of Great Britain has increased from an average of 1,048,000 in 1909–13 to 1,156,000 in 1925, or by more than 10 per cent.

5. In 1923 the occupation of the Ruhr disorganised the working of a coalfield, of which the output in normal times is equal to more than a third of that of Great Britain. The consequence was that pits were opened or kept opened here ; profits were high ; the wage agreement between the employers and the miners was revised, 11 per cent. being added to the minimum rates of pay. By the summer of 1924 normal conditions had been restored in the Ruhr. In the first half of 1925, the coal industry of Great Britain suffered the full force of the depression which had previously been impending. Prices collapsed, and the industry, taken as a whole, ceased to be remunerative.

6. To give time for an examination of these conditions and for the adoption of measures to meet them, Parliament authorised the grant of a subsidy to the industry, for the period from 1st August, 1925 to April 30th, 1926. From the beginning of that period until December 31st, 1925, this subsidy has averaged over 2s. 6d. on the ton of coal, or about 17 per cent. of the pithead price. In the last three months of the year it was 3s. per

ton, and it enabled the collieries to show in that period an average profit of 1s. 6d. per ton and wages to be maintained, while prices generally have been somewhat reduced.

The Policy of Subsidy

It is not our duty to express an opinion as to whether the grant of the subsidy in the circumstances of July, 1925, was avoidable or not. But we recommend that the subsidy should not be continued.

In our view the principle is wrong. If in any industry there is a labour dispute on wages, and a gap exists between the amounts that the employers are willing to pay and the amounts that the workers are willing to accept, or if demand declines and over-supply leads to low prices and production at a loss, it is wrong that the gap should be filled or the loss made good by recourse to the National Exchequer. It is indefensible that the people engaged in other industries should be taxed in order to provide profits for the employers or to maintain the wages of the workers, in the particular industry affected—their own profits, and their own wages, being often no better, and sometimes worse. In the industry of coal mining, under subsidy, mine-owners are now obtaining in some districts, profits per ton substantially higher than was usual in the industry before the war; and hewers are earning on an average 76s. for a full week, when in unsubsidised industries, shipwrights, for example are earning 56s., and engineering fitters 57s.

If recourse is had to this means in one crisis in one trade—unless it is definitely ruled now to be inadmissible as a policy—there will inevitably be pressure to resort to it in another crisis or in another trade. The result would be destructive to the national finances.

We are glad to observe that the Mining Association are opposed to the principle of the subsidy and advocate its early ending.

It has sometimes been suggested that collieries which are on the margin of profitability might receive some form of subsidy, as a temporary measure, to save them from closing. We cannot recommend this expedient. First, it would constitute in many cases a dole to the inefficient to the disadvantage of the efficient. Second, it is right that these collieries should bear the brunt of the economic pressure; if they are on the margin because the physical conditions are unfavourable, it may be better that they should close, and leave the production to others which are not at that disadvantage; if they are on the margin because their scale of output is too small, or because their management is not good, it is better that they should amalgamate with their neighbours, or be bought up by more competent people. Third, it would be impossible to frame any scheme drawing a line between collieries that should receive a subsidy and those that should not, which would not be open to insuperable objections.

It has been suggested, again, that since the present difficulties are due very largely to the shrinkage in our coal exports, a subsidy should be continued, limited to that branch of the trade. This also cannot be recommended. In the first place, it would have the effect of lowering the price of the British coal that was bought by the iron and steel works of France, Germany, Belgium and other countries, while leaving the home price the same. It would in effect give them a bounty, at the expense of the British taxpayer, to assist them in their competition with the British iron and steel trade in the markets of the world. In the second place, it is possible that the measure would be met by similar measures on the part of Germany, the principal competitor of our coal industry. Each of the two countries would then have imposed an additional charge on its budget, while their relative positions would remain at the end what they had been at the beginning

The Temporary and the Permanent Elements.

The problem which we have been called upon to examine is two-fold. There is the difficult position of the industry at the moment; and there is the question of its proper organisation to fit the conditions of the future. It is essential that both should be dealt with. We observe a tendency on the part of the mine-owners to concentrate their attention upon the one, and on the part of the miners to concentrate their attention upon the other. The owners are inclined to say that measures of re-organisation may be of interest, but that the really important matter is to lift the industry out of its present plight. The miners are inclined to say that the plight of the industry is due to its defects of organisation, and that what is important is to cure those. We would suggest that each view represents only a half truth.

We have recommended a series of constructive measures, which we believe will have, in the aggregate, a large and beneficial effect. But time is needed to bring them into operation. The witnesses who appeared before us on behalf of the Miners' Federation, to present the case in favour of nationalisation, fully recognised that, if that were the policy to be accepted, it also would require considerable time before the great changes of organisation which it involved could be effected. Meantime the economic difficulties that now prevail would have to be met.

It is clear that both sides of the problem must be kept in mind.

The Proposals of the Mining Association.

The Mining Association submitted to us an estimate of the deficits between the costs of production and the prices that were likely to be realised in the near future if hours, wages and other costs remained the same as now. The estimate distinguished between the different districts and the deficits varied from 3s. to

7s. 5d. per ton ; the average for the whole country would be 4s. 1d. This deficiency they suggested should be met in the following ways. The miners should be required to work an additional hour a day ; the rates of wages should be adjusted so that, other things being equal, the additional hour should not involve additional remuneration ; the rates of pay should also be reduced by amounts varying in the districts, which might be as little as 6d. per week in some and possibly as high as 15s. in others ; the mine-owners should be expected to make savings in the working costs other than wages to the extent of ten per cent. of those costs ; and the wages of railwaymen should be reduced in order that railway rates, for coal as for other commodities, should be lowered by one-fourth. It was recognised that the increased output of coal, that would be the natural result of the additional daily hour of production, might involve, until it could be absorbed by a rising demand stimulated by a low price, the dismissal of a large number of men.

The outcome of all these measures was estimated to be that the industry, on the average, would still earn no profit, but would suffer a small loss of about 3d. a ton.

For reasons which are fully set out in Section 9 of the Annex, we cannot accept those calculations. The estimate of an addition of only 40 per cent. to the prices of 1909-13 is too low. Any calculation based on assuming an addition of a uniform percentage to a pre-war basis in all districts, whether for prices or for wages, proceeds on a wrong principle. As the Mining Association have themselves repeatedly urged, and as appears from the figures cited in the Annex, the situation in the different districts is not the same.

Costs and Proceeds at end of 1925.

The right approach to the problem is from the actual experience of some recent period, in the country as a whole and in the separate districts. We take for this purpose the last quarter of 1925. Prices in that period were materially higher, on an average of all districts, than the estimate of the Mining Association—67 per cent. in place of 40 per cent. above the mean of 1909-13, and 45 per cent. above the single year 1913. We see no reason for anticipating any worse conditions than these. On the other hand, we see no reason for counting in the near future on anything materially better. There may be some improvement in prices, and we feel sure that there can be some reduction of costs, but it is impossible to count for certain on the former, and the latter can only come slowly.

The actual experience of the last quarter of 1925 must be accepted as typical of the position that has to be faced. Various considerations that bear on this and lead to this conclusion are set out fully in the Annex. The working results of the quarter are given in the following table.

Table 22.

COSTS AND PROCEEDS.

Quarter ended December, 1925.

(All figures represent shillings and decimals thereof.)

	Total Costs. (1)	Proceeds (without subsidy). (2)	Profit or Loss (with- out subsidy). (3)	Amount of Subsidy. (4)	Profit with Subsidy. (5)
		Per ton co	mmercially di	sposable.	
Scotland	16·24	14·40	-1·84	3·35	1·51
Northumberland ..	15·97	12·98	-2·99	3·84	0·85
Durham	17·10	14·16	-2·94	3·64	0·70
South Wales and Mon- mouth	20·71	17·51	-3·20	4·55	1·35
South Yorkshire ..	15·66	15·32	-0·34	} Not avail- able.	
West Yorkshire ..	17·01	17·25	+0·24		
Notts and Derby ..	5·62	15·60	-0·02		
Leicester, Cannock Chase and Warwick	15·99	17·11	+1·12		
<i>Eastern Division*</i>	15·76	15·97	+0·21	1·53	1·79
Lancashire, Cheshire and North Staffs	20·35	19·41	-0·94	3·67	2·73
Other Districts ..	19·17	16·72	-2·45	3·96	1·51
Great Britain ..	17·45	15·98	-1·47	3·03	1·56

* The Eastern Division is a single district for wage ascertainties and subsidy, comprising the four areas which for statistical purposes are shown separately just above it in the table.

With the subsidy there is shown a profit of just over 1s. 6d. a ton, taking the country as a whole. Without the subsidy there is shown a loss of just under 1s. 6d. a ton; one of the important wage-agreement districts—the Eastern Division—made a small profit; the others made losses ranging up to about 3s. a ton in Northumberland, Durham and South Wales.

A special return for the same quarter, obtained from the Joint Accountants, shows that 73 per cent. of the output was raised at a loss, apart from the subsidy. More than 60 per cent. of the coal was raised at a loss of more than 1s. a ton. In particular districts the position was far worse. The proportion of coal raised at a loss of 1s. and more per ton was in South Wales and Scotland more than 80 per cent., in Durham 90 per cent., in Northumberland 99 per cent.

The Situation in May, 1926.

This then is the position that will have to be faced next May, if proceeds and costs remain near their present levels and if the subsidy stops, as, in our view, it should stop. Such a position could not long continue. A large proportion of collieries would be compelled to close; the best collieries would remain at work and

would get higher prices for their coal. Many miners, to be numbered probably by hundreds of thousands rather than by tens of thousands, would be thrown out of work. The rise of coal prices would intensify the existing depression in the iron and steel trades and shipbuilding, and would affect other industries seriously. Export markets, both for coal and for manufactures, would be lost, causing further depression in shipping and shipbuilding, and reacting again upon coal. Ultimately a balance might be reached, with the mining industry reduced by a large percentage of its present numbers, a raised cost of living, and an intolerable burden of unemployment.

The gap between proceeds and costs in mining can in the near future be filled only in two ways : by a sudden contraction of the industry to much smaller dimensions and a rise of prices, or by an immediate lowering of cost of production. Some contraction of the industry is probably inevitable, and, in so far as it can be limited to the closing of definitely inefficient pits, it is desirable in spite of the distress that it must cause. The scale of contraction indicated by the figures of losses just given is of an altogether different order from this ; it means not the disappearance of the inefficient, but the collapse of an industry. The second way of filling the gap cannot be avoided. We come reluctantly but unhesitatingly to the conclusion that the costs of production, with the present hours and wages, are greater than the industry can bear.

Reference has already been made to the proposal of the Mining Association that costs of production should be reduced mainly by an extension of working hours. For the reasons set out at length in an earlier chapter we cannot recommend acceptance of their proposal. It would make the working day of the British miner longer than that in any important mining area in the continent of Europe, except Upper Silesia. It involves an increase of production per head ; this means either that prices would have to be lowered further to find a market, or that perhaps 130,000 men would be added to the numbers unemployed. It would be offset in part almost certainly by increased absenteeism and possibly by slackness of work. It might lead to extension of hours in other countries. It involves a lowering of the standard of life and leisure which would tend to become permanent.

There remains the question of wages. The present level of wages in mining is governed by the new minimum percentage on standard rates introduced less than two years ago by the agreement of 1924. The other changes made in that agreement—notably the increase in labour's share of the net proceeds under the wage ascertainment and the new provisions as to re-coupmnt—were changes clearly justified by the facts ; if the prosperity of the industry had continued, the workmen's wages would rightly have been increased. The increase of the minimum percentage, so as

to make the minimum wage rate of every man 11 per cent. higher than before, was not justified; if the temporary prosperity, caused by the paralysis of the Ruhr—Britain's principal competitor in Europe—did not continue, the raising of the minimum was bound to lead to an impossible situation:

Revision of Minimum Percentage.

We see no escape from the giving up of this minimum of 1924. That does not mean simply a return to the minimum of 1921, i.e., a uniform reduction of 10 per cent. on the present minimum percentage. In some districts less may be needed, in others more. It will be for the mine-owners and the miners to carry out by negotiation the necessary downward revision of district minima. That revision should be governed by the following considerations:—

- (1) In certain districts it is impossible to contemplate a reduction of wages sufficient even to balance proceeds and costs as they were in the last quarter of 1925, and on that basis there can be no question of profit. These, however, are districts in which there are grounds for hoping that prices may be raised.
- (2) In other districts, though current prices may allow of profits being earned, it may still be found necessary to make a reduction of the minimum percentage, having regard to the future of the industry.
- (3) The position of the worst-paid men should be safeguarded as at present by subsistence allowances. Whether or not any revision of those allowances is desirable, with a view to bringing different districts more into line, is a point for consideration, but not an important one. It does not affect substantially the question of wages costs.
- (4) Recoupment to employers of any expenditure incurred by them in paying wages at the new minimum rather than on the basis of the ascertainment should be postponed till wages shall have risen again, in accordance with the ascertainment, at least to the minimum now ruling under the 1924 agreement.

On lines such as these it seems to us that the revision of the minimum percentage should be undertaken. Only the minimum percentage is in question and neither the subsistence wage nor the actual wage to be paid under normal conditions. The man getting 45s. or thereabouts by subsistence allowance can and should be protected; lowering of the minimum percentage as such does not touch him, but affects the higher paid men getting "on minimum" up to £4 and over. Again revision of the minimum is not a fixing of the wages that will be paid for all time. If by May or later the course of prices gives proceeds more than sufficient to pay the new minimum in any district, higher wages

will be paid automatically under the wage-ascertainment. If and when improvements in the organisation of the industry lead to a reduction of costs per ton, the same result will follow. What we contemplate is not a permanent lowering of wage standards but a temporary sacrifice by the men in the industry, other than the worst paid, in order to avoid the possible unemployment of hundreds of thousands of them. Whatever sacrifice they can reasonably be called upon to make cannot avoid the need for heavy sacrifices by the mine-owners.

It is felt, we know, by many of the men that they ought not to be called on for any sacrifice. They are not responsible, it is said, for the conduct or for the plight of the industry. We accept this view, in so far as we regard the main causes of the present difficulties as economic ones—events and movements in the world outside Great Britain. But it is fair to point out that one factor in the costs of production is the shorter working day won by the miners in 1919.

Any material fall of wages will, we fully recognise, on the facts presented elsewhere in this Report, bring real wages at the present cost of living, below pre-war level for a large proportion of the miners. This is a necessity to which other great industries have been driven. In the situation immediately confronting us it cannot be avoided for the coal industry except by making that industry a burden on the rest of the community or by returning to a longer working day. There is, however, at least a possibility that a fall in the cost of living may follow on the fall of wholesale prices which took place in 1925, and so relieve the situation.

It is necessary, finally, to emphasise the fact that, in our view, revision of the minimum percentage should depend upon acceptance by all parties of such measures of reorganisation as will secure to the industry a new lease of prosperity leading to higher wages.

Suggestions for Meeting the Situation.

Our suggestions for meeting the present situation are as follows :—

1. Before any sacrifices are asked from those engaged in the industry, it shall be definitely agreed between them that all practicable means for improving its organisation and increasing its efficiency should be adopted, as speedily as the circumstances in each case allow. The measures to these ends which we consider practicable are stated in the preceding chapters of this Report, and will be summarised in the chapter that follows.

2. The owners should discontinue charging the miners as a body with deliberate attempts to destroy the prosperity of the industry, in order to compel its nationalisation. It is possible that there may be a small number of individuals here and there who are animated by this idea, but we are convinced that the point is without substance.

3. The owners should also cease to countenance accusations against the miners of restriction of output. Here again there may be sporadic cases, and when the rates of pay for new classes of work are under discussion, production may sometimes be purposely kept at a low level. But viewing the effect upon the industry as a whole, this point is quite unimportant.

4. The miners on their part should cease to attach exaggerated weight to losses of output due to failures of the management to provide the colliers with proper supplies of tubs, rails, timber or other requisites. Such cases undoubtedly occur from time to time, and a proportion of them are due to inefficient management. In particular places and on particular occasions an appreciable loss may be caused, both to the colliery and to the workman. But the effect upon output in general, and upon wages, is very small.

5. The mine-owners should not refuse to engage in discussions on a national footing with the Miners' Federation of Great Britain. All the principal industries of the country conduct negotiations between employers and employed on a national basis, and we can see no reason why the mining industry should be an exception. At the same time, the conditions imperatively require that there should be a large degree of flexibility in the wage rates of the different districts. The Miners' Federation should recognise this, without detriment to the broad policy that the general principles should be laid down nationally.

6. As the first step accordingly, to the making of a new wage agreement, the Mining Association and the Miners' Federation should meet nationally. The procedure to be followed thereafter will depend upon the decisions then taken; it appears to us a reasonable course for the national conference to refer the question of minimum percentage and such other matters as they think appropriate to district associations to frame proposals. Those proposals would be submitted to the national conference for approval.

The Closing of some Collieries.

Whatever the course that may be taken in these and other matters, it seems to be inevitable that a certain number of collieries must be closed in the immediate future. In view of the state of demand at home and abroad, together with the developments in South Yorkshire and Nottinghamshire, it is plain that the industry, in the other districts, is too large in size for the requirements it has to fulfil. Under nationalisation precisely the same situation would present itself.

Most of the mines that will close will probably be the older mines, whose life would be nearing its end in any case. The loss of capital involved will usually not be large, for the original investment, and the additions to it, will in most cases have been fully amortised. If this had not been done it would argue bad financial management. These are the mines also that usually

provide the worst housing accommodation for the workers, and present the greatest difficulty in securing a remedy, on account of the short period of working still in prospect.

It is sometimes suggested that the miners in such cases would be well advised to accept lower wages locally, in order to avoid the necessity of finding employment elsewhere. The result would only be that the marginal collieries—and there always will be marginal collieries—would be one grade lower down the scale. No national interest is involved here, and there is, of course, no reason why the mine-owners generally should take combined action in order to keep open this class of collieries for a few years longer, at the cost of lowering the standard of living of the men.

Any transfer of labour, however, if it has to take place on a considerable scale, is always a matter of much difficulty; there is a lack of houses in the new districts, in which the workmen can be accommodated; there are differences in working conditions and other difficulties. It appears that there is no demand for British miners in the Dominions, though many of them might make useful agriculturists, and would be welcomed there in that capacity. We regard it as a matter of much importance that, should the occasion arise after the discontinuance of the subsidy, the Government should be ready to take all practicable measures for the assistance of any labour that may be displaced, or for facilitating its transfer, and should provide such funds as might be required for those purposes.

CHAPTER XXII.—SUMMARY OF FINDINGS AND RECOMMENDATIONS.

The coal mining industry, for more than a century the foundation of the economic strength of the country, has come upon difficult times. This change of fortunes is the result of powerful economic forces. It is idle to attribute it either on the one hand to political unrest or restriction of output among the miners, or on the other hand to inefficiency in the day by day management of the mines.

At the same time we cannot agree with the view presented to us by the mine-owners that little can be done to improve the organisation of the industry, and that the only practicable course is to lengthen hours and to lower wages. In our view large changes are necessary in other directions, and large progress is possible. We agree that immediate measures are indispensable to deal with the immediate position, but the effort ought not to stop there.

The problem indeed is two-fold. It has a permanent aspect and a temporary aspect. We have proposals to make with regard to each. We will take first the permanent aspect.

The Need for Changes.

The industry is marked by great diversities. Among the existing collieries many date from an earlier time, and according to modern standards are badly planned. The defects are the result partly of the age of our coalfields, partly of the private and divided ownership of the minerals, with its effects on the lay-out of the mines, partly of other causes. Very many of the collieries are on too small a scale to be good units of production. A number are defective in equipment and some in management. On the other hand there are a large number of collieries which are admirably planned, equipped and managed.

The methods of utilising coal are unscientific. Four-fifths of the coal consumed in the country is burnt in a raw state; oil and valuable by-products are wasted and the atmosphere is polluted.

Research into the methods both of winning and of using coal is inadequate.

Mining, in many places, should be intimately associated with several other industries—with gas, electricity, smokeless fuel, oil, chemical products, blast furnaces and coke ovens. A beginning has been made towards this combination, but it is no more than a beginning.

The selling organisation and the methods of transport, are too costly, and do not secure the best financial results for the collieries, and therefore for the miners employed in them.

While the relations of employers and employed are generally better than sometimes appears on the surface, the organisation of the industry on its labour side calls for many improvements.

The Proposal for Nationalisation.

As a remedy for these defects the Miners' Federation propose the nationalisation of the mines. We do not recommend the adoption of this policy, for reasons which have been fully stated in this Report.

We are not satisfied that the scheme proposed to us is workable, or that it offers a clear social gain. We perceive in it grave economic dangers, and we find no advantages that cannot be obtained as readily, or more readily in other ways.

We contemplate accordingly the continuance of the industry under private enterprise, but we make a number of proposals for its re-organisation.

Recommendations on Re-organisation.

1. *Ownership of the Mineral.*—The error which was made in times past, in allowing the ownership of the coal to fall into private hands, should be retrieved. The mineral should be acquired by the State—by purchase where it has a market value, by a declaration of State ownership in the case of unproved coal or coal at deep levels, which has now no market value. The coal of existing mines which are likely soon to cease working, and coal which is not now worked and is not likely to be developed in the future, should be excluded from the purchase. Safeguards should be adopted against excessive compensation claims. A Coal Commission should be appointed, under the authority of the Secretary for Mines, to acquire and administer the mineral property.

2. *Amalgamations of existing Mines.*—The amalgamation of many of the present small units of production is both desirable and practicable. This may often be effected from within, but in many cases it will only take place if outside assistance is given. Any general measure of compulsory amalgamation, on arbitrary lines, would be mischievous; the action to be taken should be elastic and should enable each case to be treated individually. The State as mineral owner will be able to promote desirable amalgamations when granting new leases or renewing old ones. Legislation should provide for a compulsory transfer of interests under existing leases where desirable amalgamations are prevented by the dissent of some of the parties or their unreasonable claims. Existing leases would not otherwise be affected.

3. *Combination of Industries.*—A closer connection of mining with the allied industries should be promoted. Highly technical questions are involved, affecting a number of industries, and not electricity alone. The development of electrical supply under the new proposals of the Government should be closely co-ordinated with the generation of electricity at the mines. The heat, power and light requirements of the country should be under the constant and comprehensive survey of a body formed for the purpose. We propose for consideration the establishment of a National Fuel

and Power Committee, with advisory powers, composed of representatives nominated by the Government from among the official and other bodies concerned.

4. *Research.*—The existing provision for research should be largely extended by the industry with the support of the State. It is urgently necessary that new methods for winning and utilising coal should be sought for, and should be found, if the prosperity of the industry is to be restored and a proper standard of wages and working conditions assured to the workers. If processes of low temperature carbonisation were perfected, great national advantages would ensue, particularly through the production of a smokeless fuel for domestic and industrial use, and the provision of large supplies of mineral oil from the country's own resources. The State should give financial support to the further experiments, on a commercial scale which are necessary.

5. *Distribution.*—The industry as a whole has so far failed to realise the benefits to be obtained by a readiness to co-operate. Large financial advantages might be gained by the formation, in particular, of co-operative selling agencies. They are specially needed in the export trade.

The Government should consider the establishment of an official system for the sampling and analysis of coal, with a view to encouraging selling on specification and guarantee, in both the home and the foreign markets.

Local authorities should be empowered to engage in the retail sale of coal.

We propose measures to secure the adoption of larger mineral wagons on the railways, and a greater concentration of ownership of wagons. A Standing Joint Committee of the Ministry of Transport and the Mines Department should be formed to promote these measures.

6. *Labour.*—The relations between employers and employed are of fundamental importance, and here also we are convinced that a number of changes are necessary.

(1) The principle on which the recent wage-agreements have been based is in our opinion sound, but amendments are needed in the method of ascertaining the proceeds of the industry for the fixing of wages. A large proportion of the coal is sold by the mines to associated industries, and the most important of these amendments relates to the prices at which these transfers are made.

(2) The standard length of the working day, which is now on the average $7\frac{1}{2}$ hours underground, should remain unaltered. The optional re-distribution of hours within the present weekly total, over a week of five days instead of six, should be considered. The multiple shift system should be extended.

(3) Joint pit committees should be established generally.

(4) The methods of payment of men not employed at the face should be revised where possible so as to give them a direct interest in output.

(5) The introduction of a family allowance system, either nationally or by districts, is desirable. Pooling schemes should be adopted to prevent married men with families being prejudiced in obtaining employment.

(6) Profit-sharing schemes, providing for the distribution to the workmen of shares in the undertakings, should be generally adopted in the industry, and should be made obligatory by statute.

(7) For all new collieries, a proper provision of houses for the workers should be a condition of the lease.

(8) The general establishment of pit-head baths is necessary. This should be undertaken by the existing Miners' Welfare Fund, which should be increased by a substantial contribution from royalties.

(9) When prosperity returns to the industry we consider that annual holidays with pay should be established.

The Immediate Problem.

To bring any of these measures of re-organisation into effect must need a period of months; to bring all of them into full operation must need years. The Miners' Federation fully recognise that, even if nationalisation were to be accepted, much time must elapse before the great changes it involves could be put into force and the effects be seen. Meantime the hard economic conditions of the moment remain to be faced.

The dominant fact is that, in the last quarter of 1925, if the subsidy be excluded, 73 per cent. of the coal was produced at a loss.

We express no opinion whether the grant of a subsidy last July was unavoidable or not, but we think its continuance indefensible. The subsidy should stop at the end of its authorised term, and should never be repeated.

We cannot approve the proposal of the Mining Association, that the gap between costs and proceeds should be bridged by an increase of an hour in the working day, reductions in the miners' wages, some economies in other costs, and a large diminution in railway rates to be effected by lowering the wages of railwaymen. In any case these proposals go beyond the need, for we do not concur in the low estimate of future coal prices on which they are based.

While the mine-owners presented a plan which is unacceptable, the Miners' Federation abstained from making any suggestion as to the means for meeting the immediate situation. The duty therefore devolves upon the Commission to formulate its own proposals.

If the present hours are to be retained, we think a revision of the "minimum percentage addition to standard rates of wages," fixed in 1924 at a time of temporary prosperity, is indispensable. A disaster is impending over the industry, and the immediate reduction of working costs that can be effected in this way, and in this way alone, is essential to save it. The minimum percentage is not a "minimum wage" in the usual sense of that term. The wages of the lowest paid men will be safeguarded by a continuance of the system of subsistence allowances. The reductions that we contemplate will still leave the mine-owners without adequate profits in any of the wage-agreement districts, and without any profits in most districts. If trade improves and prices rise, a profit will be earned. If prices do not rise, an adequate profit must be sought in the improved methods which should in any case be adopted.

Should the miners freely prefer some extension of hours with a less reduction of wages, Parliament would no doubt be prepared to authorise it. We trust, however, that this will not occur.

We consider that it is essential that there should be, as there always has been hitherto, considerable variation in the rates of wages in the several districts. But we are strongly of opinion that national wage agreements should continue. Such agreements are entered into in all the other British industries of importance.

We recommend that the representatives of the employers and employed should meet together, first nationally and then in the districts, in order to arrive at a settlement by the procedure that we have previously suggested.

By a revision of the minimum percentage coal mining would be saved from an immediate collapse, but it seems inevitable that a number of collieries would still have to be closed. This may give rise to the necessity for a transfer of labour on a considerable scale. We recommend that the Government should be prepared in advance with such plans to assist it as are practicable, and should provide funds for the purpose.

Conclusion.

In the summer of last year the nation was oppressed by a grave anxiety. Having emerged from the mental stress and the economic strain of an unprecedented war, aware of the imperative need of recuperating its strength, it found itself faced by the possibility of an industrial conflict, or a series of conflicts, on a scale equally unprecedented, perhaps, in extent and in duration. And the issues that were at stake were wider even than the limits of the nation; for the stability and the prosperity of Great Britain have a profound influence both upon the opinion and upon the interests of Europe, and of the world at large. If there were here a period of confusion and conflict, of instability and retrogression, the effects would be felt in a widening circle everywhere else.

This Commission was appointed to investigate the causes of the trouble and to endeavour to suggest a remedy. We have discharged our onerous duty to the best of our ability. There is no part of this wide field which we have not sought to examine. We have suggested a series of definite constructive proposals.

The way to prosperity for the mining industry lies along three chief lines of advance: through greater application of science to the winning and using of coal, through larger units for production and distribution, through fuller partnership between employers and employed. In all three respects progress must come mainly from within the industry. The State can help materially—by substantial payments in aid of research; by removing obstacles to amalgamation under existing leases; as owner of the minerals by determining the conditions of new leases; by legislation for the establishment of pit committees and of profit-sharing, and in other ways.

The future depends primarily upon the leadership, and the general level of opinion, among the mine-owners and the miners of Great Britain. In laying down our charge, we would express our own firm conviction, that if the present difficulties be wisely handled, if the grievances of the one side and of the other be remedied, and a better spirit prevail in consequence between them, the mining industry, with the aid of science, will certainly recover, and even surpass, its former prosperity. It will again become a source of great economic strength to the nation.

All which we humbly submit for Your Majesty's gracious consideration.

HERBERT SAMUEL (*Chairman*).

H. A. LAWRENCE.

W. H. BEVERIDGE.

KENNETH LEE.

C. S. HURST (*Secretary*).

F. C. STARLING (*Assistant Secretary*).

6th March, 1926.

ANNEX TO THE REPORT.

1. Explanatory Note.

The following points relate to the official statistics quoted throughout this Report:—

- “Tons,” unless otherwise described, mean British tons of 2,240 lbs.
- “Exports” include coal shipped as foreign bunkers, wherever particulars are available.
- “Coke and manufactured fuel,” when classified with exports of coal, are in terms of their coal equivalent.

The figures of British production, home consumption and exports are affected by the fact that Ireland is included with Great Britain up to the year 1921, but not after that year. The Irish production in 1921 was less than 100,000 tons and approximately the same as in 1909–13, and the number of persons employed at the mines was about 900. The consumption of coal in Ireland may be estimated at four to five million tons per annum and has probably not changed materially since before the war.

Figures of British output are variously given under the headings of—

- (a) Coal raised, i.e., all coal as raised and weighed at the pithead *before* the extraction of stone and dirt at the pit-head and the washing of the coal.
- (b) Saleable coal, i.e., all coal as above, *after* the extraction of stones and dirt, and washing.
- (c) Coal commercially disposable, i.e., saleable coal *less* the amount required for colliery consumption and the supply of coal free or at special rates to miners, officials, royalty owners, etc.

The value of the output of British coal is shown either as—

- (a) The value at the pithead of all coal raised, including the market value of coal used at colliery engines, supplied to mines and transferred to own works.
- (b) The proceeds of the coal disposed of commercially (as above)

Foreign coinages have been converted into £'s sterling in the war and post-war periods at the average yearly rates of exchange in the respective countries. In the pre-war period they have been converted at the par rate of exchange.

Except where otherwise stated, the particulars relate to calendar years throughout.

“Mines” are distinguished from “undertakings.” An undertaking means an ownership comprising one or more mines.

The following note explains the variations in the numbers of mines and undertakings given in the Report :—

(a) *Number of Mines.*—The Mines Department collects and publishes annually information as to persons employed, output and equipment of all mines under the Coal Mines Act. These mines include stratified ironstone, oil shale, and fireclay mines at which no coal is produced. Mines are included at which persons were employed, but where there was no output during the year (they may have been sinking, repairing, pumping etc.). At other mines coal may be only a subsidiary product.

Generally speaking, in collecting statistics for the Commission, only those mines have been included which produced coal as the principal mineral and which employed more than 10 persons.

The result is that there has been some confusion as to the number of coal mines in the country. The following statement shows the position for the year 1924 :—

- (i) 2,481 mines produced coal as the principal mineral.
- (ii) 97 mines produced coal as a subsidiary mineral
- (iii) 137 mines, which are not coal mines (*e.g.*, iron stone, fireclay, oil shale).
- (iv) *140 coal mines produced no coal during the year (sinking, repairing, pumping, etc.).

Total 2,855 mines at work under the Coal Mines Act.

Thus, the number of mines which produced, or are likely to produce coal (*i.e.*, (i) + (ii) + (iv)) was 2,718 and this figure is comparable with the figure of 3,12 for 1913.

* Of the 140 mines under (iv) 80 are mines which will produce coal as the principal mineral.

- (b) *Number of Undertakings.*—The number of owners of mines under the Coal Mines Act in 1923 was 1,601, and the number of mines 2,902. The owners of mines actually producing coal as the principal mineral in 1924 number about 1,400. The Joint Accountants' returns for 1923 covered 653 owners and 1,618 mines. The explanation of the large difference is as follows:—

The Joint Accountants' returns exclude

- (i) Small collieries employing 10 men or less.
- (ii) Mines where coal is a subsidiary mineral.
- (iii) Stratified ironstone, fireclay, oil shale, etc., mines, which raise no coal.
- (iv) Undertakings which are not part of the Mining Association.

In addition, some undertakings which are members of the Mining Association, and which employ more than 10 men, do not furnish returns.

2.—Survey of Foreign Production and Markets.

Note.—In all the tabular statements in this Section (unless otherwise stated) the figures include the coal equivalent of coke and manufactured fuel.

Germany, France and Belgium (including Luxemburg).

Reference has already been made to the difficulty of comparing the pre-war and post-war periods owing to territorial and fiscal changes in Germany, France and Belgium, and in the following table the whole of this area has been treated as one, within its pre-war boundaries. External trade between these countries has been regarded as internal trade, and is excluded from the export trade. Polish Upper Silesia and the Saar district are included with Germany, as they were in 1909–13.

Table 23.

Period.	Con- sumption of Coal.	Exports of Coal.*	Imports of British Coal.	British Coal Imports as a Percentage of Total Consumption.
	(1)	(2)	(3)	(4)
<i>Annual average :—</i>	<i>Million Tons.</i>			<i>Per cent.</i>
1909–13	217·83	27·55	20·73	9·5
<i>Year :—</i>				
1913	239·77	34·26	22·59	9·4
1922	212·36	17·02	22·64	10·7
1923	184·98	16·95	40·37	21·8
1924	230·31	15·78	22·19	9·6
1925 (provisional)	230·28	23·15	15·73	6·8

* Reparation deliveries to Italy are included.

In 1925 about 15½ million tons of British coal were imported into this area, representing nearly 7 per cent. of the entire coal consumption within it. In 1923 the quantity and proportion were 40½ million tons, and nearly 22 per cent., respectively, but this was due to the interruption of supplies from the Ruhr following upon the occupation. In 1924 and 1922 the position was very similar to that of the pre-war period, when the quantity of coal supplied by Great Britain amounted to about 20½ million tons, which represented nearly 10 per cent. of the entire coal consumption in the area.

Incidentally, it will be noted that exports of coal from the area (including Reparation coal deliveries to Italy) rose by 7½ million tons between 1924 and 1925, although they were still 4½ million tons less than in 1909–13.

The consumption of coal in this area amounted to about 230 million tons in 1924 and in 1925, or 12½ million tons more than in the pre-war period.

(a) *Germany.*

The British imports into Germany in the pre-war period and in recent years were as follows :—

<i>Annual average :—</i>		<i>Tons.</i>	
1909-13	9,438,000
<i>Year :—</i>			
1924	6,318,000
1925	3,451,000

If the pre-war territorial basis is still taken for the purposes of comparison the output of coal in Germany in 1925 was 169·74 million tons and compares with an average annual output of 161·68 million tons in 1909-13. The consumption of coal (exclusive of lignite) in 1925 is not likely to have exceeded 130 million tons ; in 1909-13 the annual average consumption was 136·33 million tons.

With an increased production of coal and a reduced consumption, a greater quantity has been exported, a fact which is partly explained by the obligation on the part of Germany to furnish coal, etc., on a pre-war scale as Reparations to France, Italy, Belgium and Luxemburg.

The reduced consumption of coal is partly accounted for by the development of lignite, or brown coal. This is a fuel which lies between peat and bituminous coal. It is soft and therefore easily worked, and contains a high percentage of water (up to 50 per cent.). When dried, lignite is liable to crumble into powder and this makes it unsuitable for transporting over long distances. Generally it is made into briquettes with a suitable binder at the place of production.

Lignite frequently lies near the surface, and all that is necessary to enable it to be worked is for the overburden to be removed with mechanical strippers ; the soft fuel thus exposed is cut by mechanical means. The output per person employed is accordingly very large. In view of these advantages and of the lower price, the development of the production of lignite in Germany has been rapid. In 1925 the output was 138 million tons, or nearly twice as much as the average annual output of 73·60 million tons in 1909-13. The additional 64 million tons of lignite raised in 1925 represents, in terms of bituminous coal, at least 15 million tons, or substantially more than the reduction in consumption of bituminous coal in the country.

Small quantities of lignite are exported, mainly in the form of briquettes. But one of the chief uses of this fuel is in the production of electricity, which is carried over a large part of southern Germany by means of high pressure transmission systems. Evidence was

also given before us to the effect that lignite is found in certain industries to give even better results than coal. Though it began as a coal substitute, it now holds its own against coal in them. It is used entirely in Germany now for the nitrate industry and it is preferred by the glass industry to coal.* It may be mentioned that in 1924, 41 per cent. of the public electricity supply was generated from power derived from lignite as compared with 23 per cent. in 1914.†

There has been an extensive development of hydro-electric schemes in recent years, and at the end of 1923, 1·1 million horse-power was actually in use.

In addition to the assistance which Germany has thus derived from other sources of power and heat, much has been done in the direction of increased economy in the use of coal. It has been stated in evidence before us that this has resulted in a saving of about 10 per cent.**

About four-fifths of the entire German output of coal on the present-day basis is furnished by the Lower Rhenish Westphalian coalfield, including what is popularly known as the Ruhr. Nearly 100 million tons of coal were produced in this coalfield in each of the years 1922 and 1924, a figure which is not far different from the annual average production in 1909–13. In 1925, production rose to over 102 million tons. During 1924 and 1925, however, considerable stocks of coal and coke amounting at one time to about 10 million tons, were reported to have accumulated at the pits and in the hands of the Rhenish Westphalian Coal Syndicate. An outline history of this Syndicate is printed in Appendix No. 22. The collieries in the district contract to sell their coal and coke through it.

The coal from this field comes into close competition with British coal in the coastal districts of Europe, chiefly in the Netherlands and France, and to some extent in the Baltic and the Mediterranean Seas. The proximity of the pits in this field to the Rhine and to a good canal system has facilitated this competition. But for the most part it furnishes considerable supplies of coal and coke for the iron and steel industries of Rhenish Westphalia, Lorraine, Belgium, Luxemburg and France.

According to information which has been given to us in evidence, the seams of coal worked in this field are on the average thinner than the most economical section and lie at a considerable depth below the surface. They are very faulted and highly inclined, gas is prevalent, and pumping costs are fairly heavy.‡

The quantity of coal got per man-shift worked below and above ground in 1924 was 16·88 cwts. In 1925, when conditions in the pits were less abnormal than in 1924, the output was about the same level as in 1913, when it was 18·42 cwts.

* Leith-Ross, Q. 2023.

† Sargent, para. 25 (b).

** Leith-Ross, Q. 2045.

‡ Haldane, Appendix No. 15.

Wages of the miners in this district are not greatly higher now than in the pre-war period. In the first quarter of 1925, the latest date for which figures are at present available, they were 6s. 7d. per man-shift. This includes payment for overtime, family allowances, etc. For the years 1911-13 they were 5s. 3d., and for 1913, 5s. 6d.

The average value of the coal raised in the Lower Rhenish Westphalian coalfield was 20s. 1d. per ton in 1924, or nearly twice as much as in the years 1909-13.

It is not without interest, to compare the course of coal export values in Great Britain and Germany since the middle of 1924 when more normal conditions have prevailed in the Lower Rhenish Westphalian coalfield. Similar figures for overseas shipments of bituminous coal from the United States have been added for comparison. By taking averages at each date for three consecutive months, as is done below, minor changes are eliminated. Values in all cases are stated in terms of gold marks per metric ton.

Table 24.

Average value for 3 months, of which the middle month was :	Great Britain.	Germany.	United States of America to Overseas Markets.
<i>Gold Marks per Metric Ton.</i>			
1924 :			
July	20·99	23·14	21·17
August	21·03	22·28	20·57
September	20·93	20·44	19·90
October	20·80	19·39	19·66
November	20·76	19·21	19·79
December	20·99	19·47	19·60
1925 :			
January	20·96	20·14	19·50
February	20·81	20·06	19·36
March	20·59	19·82	19·35
April	20·61	19·55	19·06
May	20·53	19·46	18·93
June	20·37	19·55	18·61
July	19·94	19·81	18·64
August	19·44	20·31	18·90
September	18·96	21·09	19·40
October	18·77	21·25	19·66
November	18·67	21·02	—

To sum up the position in Germany, we find that the production of coal is greater than in the pre-war period, but that the consumption of coal is less, quite apart from territorial changes made in the interval. But some considerable part of the lessened consumption of coal is compensated for by economies in its use,

and more still by the largely developed supplies of lignite and water power. It is found less necessary than before to import coal, while it is possible to export more. The explanation largely lies in the increased use made of these alternative supplies of heat and power.

By a relatively high rate of output and low rate of wages, as compared with the pre-war period, German coal appears in the pre-subvention period to have had some advantage over British coal, but the heavy stocking in the Ruhr and the closing down of a large number of pits, entailing a large reduction in the numbers employed, shows that the coal industry has been passing through a serious depression in Westphalia, as elsewhere.

(b) *France.*

The British imports into France in the pre-war period and in recent years were as follows :—

<i>Annual Average :—</i>				<i>Tons.</i>
1909–1913 .. .. .	..	..	..	9,438,000
<i>Year :—</i>				
1924 .. .. .	..	..	..	12,996,000
1925 .. .. .	..	..	..	9,989,000

More than one-third of the coal used in France before the war was imported. The mines of Alsace-Lorraine have now been ceded to France, and the ownership of the coal mines of the Saar district has been vested in France. At the end of a period of 15 years, from 1920 the inhabitants are to determine by plebiscite whether their territory shall continue to be administered by a Commission of the League of Nations, or whether they shall be annexed to France or Germany. (In the last alternative, Germany must buy the mines back from France in gold.) Up to the 10th January, 1925, when the Saar District was brought within the French Customs Union, the output of the Saar mines was regarded differently from that of the mines of France (including Alsace-Lorraine), and coal supplied from the Saar mines was included with the quantities imported. On this basis imported coal in 1924 represented 46 per cent. of the total quantity consumed.

The quantity of coal exported from France amounted to little more than three million tons in 1924, and in the pre-war period to just under two million tons. At the present time the quantity exported is over five million tons, but this includes coal exported from the Saar district to countries outside France.

In the years 1924 and 1925 the production of coal (including that of Alsace-Lorraine) was 43·30 million tons and 46·29 million tons, respectively. The average annual production in the pre-war territorial area of France in 1909–13 was 38·12 million tons. In 1913 it was 39·41 million tons or, including the production of the mines in Alsace-Lorraine, 43·14 million tons.

During the years immediately following the war, production was much reduced owing to the damaged condition of many of the mines in the Nord and Pas de Calais districts. In 1913, these

mines contributed more than 20 million tons, or about one-half of the total output of the country. In January, 1920, the annual rate of output was only 3 million tons. To-day, the aggregate production has been restored practically to the 1913 level.

Consideration for this was given to France by the Treaty of Versailles, which provided that "the loss in output as measured " by the difference between the annual production before the war " and the production during the years to which the Treaty " provisions relate shall be made good from coal produced at " German mines."^{*}

The treaty also made provision for the maintenance of supplies of coal and coke normally supplied to France by Germany before the war. In 1913 these amounted to 6.7 million tons. Since the Reparation deliveries became operative early in January, 1920, France has received as reparations (including the quota in respect of the war-damaged mines) from 9 to 12 million tons per annum, except in 1923, when the quantity was only 4½ million tons. It should be added that these deliveries provide for the requirements of Alsace-Lorraine, which was German territory at the earlier date.

In 1925, 46 per cent. of the total quantity of coal imported by France was German and 36 per cent. British. In 1924, the proportions were 35 per cent. and 38 per cent. respectively.

In these periods French territory included Alsace-Lorraine, in which German coal is more accessible than British coal. This partly accounts for the lower proportion of German coal in the years 1909-13, when the percentages were 28 per cent. German and 45 per cent. British.

Restricting comparison to coal alone, and to pre-war territory, it is found that, comparing 1925 with 1909-13, there has been an increase of 3 million tons in the output of the French coal mines ; an increase of nearly 10 million tons in the quantity of coal consumed, and an increase of over 6 million tons in the quantity imported. These figures indicate that the industrial position of France has greatly improved since the pre-war period, in spite of the temporary loss of some of her mines.

The *per capita* consumption of coal, coke, etc., in France to-day (including Alsace-Lorraine) is about 37 cwts., and compares with 29 cwts. in pre-war France in 1909-13.

Nor is the picture complete without reference to the increased use which is now made of water power. At the end of 1923 the power actually developed amounted to 1½ million horse power. This is equivalent to the consumption of some 4 million tons of coal. Important sections of the railway system of the country will derive current for traction purposes from water power in the near future.

The great development of electrical energy at the mines in the Nord and Pas de Calais coalfield is also of interest. This is one

^{*} Leith-Ross, para. 3 (c).

of the advantages derived from the reconstruction of the war-damaged mines. Not only is power made available to the mines, and to the general public in the locality, thus avoiding the conveyance of coal for short distances, but it is conveyed as far afield as Calais.

With a slightly increased production of coal at French mines, and a substantial increase in the quantity imported (chiefly from the Saar district), the quantity of coal consumed in France has increased both absolutely and relatively even when allowance is made for territorial changes. The mines in the principal coalfield have been remodelled on up-to-date lines, and the supply of electrical energy now obtained from large power stations erected at the mines and from the development of water-power may seriously modify the future prospects for British coal in France.

(c) *Belgium (including Luxemburg.)*

The British imports into Belgium in the pre-war period and in recent years were as follows :—

<i>Annual Average :—</i>	<i>Tons.</i>
1909–13	1,857,000
<i>Year :—</i>	
1924	2,877,000
1925 (estimated)	2,288,000

During the period 1909–13 the average output of coal was nearly 23 million tons a year, and 24½ million tons were consumed. About one-third of the Belgian produce was exported, and a slightly larger quantity was imported. The reason for this was that while there was an excess of manufacturing fuel in Belgium, there was a deficiency of coal suitable for making metallurgical coke.

For this reason the discovery and exploitation of the Campine coalfield in recent years, in which good coking coal is found, is likely to have important consequences in the near future upon the Belgian demand for coal from abroad. The production of coal in this field rose from 10,000 tons in 1917 to over 1,100,000 tons in each of the years 1924 and 1925.

In May, 1922, the State of Luxemburg, which before the war was part of the German Customs Union, allied itself with Belgium for economic purposes. The State possesses an important metallurgical industry, but is devoid of any native sources of fuel supply. The consequence has been that, while the production of Belgian coal has during each of the years 1924 and 1925 regained its pre-war level of nearly 23 million tons, exports are now little more than one-half their former quantity, while imports of fuel are now about 50 per cent. greater than before. To a large degree these changes correspond with the change in the position of Luxemburg. It is reflected in the *per capita* consumption of coal in Belgium, which was 65 cwts. in 1909–13, and, including Luxemburg, 80 cwts. in 1924, and 76 cwts. in 1925.

The working conditions at Belgian mines are reported to be similar to those of the Westphalian coalfield; but the coal is rather softer. The numbers of persons employed in 1925 and 1924 were 161,867 and 169,518, respectively. The annual average in 1909-13 was 144,355, and the annual average tonnage of coal raised per man employed fell from 159 tons in 1909-13 to 141 tons in 1925.

Later information than that for 1923 is not yet available for the value of the coal raised, costs of production and earnings at Belgian mines. In that year, which it will be remembered was the year of the Ruhr occupation, earnings of the individual worker amounted to £84·63 as compared with £56·08 in 1909-13; the average cost of production was 22·9s. per ton as compared with 12·4s.; and the average value of the coal raised was 24·7s., compared with 12·8s. per ton.

In 1923, the average rate of profit was at the exceptionally high level of 1·8s. per ton, or the same as during the period 1899-1903. In 1909-13 it amounted to only 0·4 s. per ton.

The Belgian statistics do not record the actual number of persons employed; the numbers given are merely an estimate of the number of persons required to raise the coal obtained in any year assuming no loss of time on the part of individual workers from any cause. Calculations of the tonnage got and earnings* based on these numbers tend, therefore, to be higher than in those countries such as Great Britain where the actual numbers employed at the mines are recorded, and the output and earnings per person employed reflect the time which is lost through sickness, injury, bad trade, etc.

Like France and Italy, Belgium was accorded an option on German coal under the Peace Treaty, ensuring the continuance of the pre-war supplies upon which her metallurgical industry was dependent. Since 1921 about 3 million tons of coal a year have been furnished to Belgium in this way, a smaller quantity in 1923 having been compensated for by larger deliveries in 1924. These quantities are exclusive of the fuel sent to Luxemburg under a similar arrangement, of which the record is incomplete. During the years 1921-24 the Reparation deliveries from Germany to Luxemburg averaged 1½ million tons a year. During 1909-13, about 5½ million tons of coal per annum were received by Belgium from Germany, or about two-thirds of the total quantity imported annually in that period.

From this analysis it is apparent that the production of coal in Belgium in recent years has reached the pre-war level, while consumption, relatively to the population of the country, has increased.

Exports of British coal to Belgium during recent years have been heavy, but in 1925 they were greatly reduced, though still in excess of the quantities sent in the pre-war period.

* From 1919 earnings are based on the average number of persons on colliery books.

(d) Scandinavia and Denmark.

The British exports to these countries in the pre-war period and in recent years were as follows :—

<i>Annual Average :—</i>				<i>Tons.</i>
1909-13	..	..	..	9,918,000
<i>Year :—</i>				
1924	..	..	..	11,591,000
1925 (estimated)	..	..	..	8,806,000

These countries have long furnished an important market for British coal. Scandinavia possesses no coal deposits of importance, and Denmark none at all. On the other hand, there are possibilities of an extensive development of water-power in Scandinavia, and the transmission of part of this to Denmark is now an accomplished fact.

About 11½ million tons were imported into these countries from all sources in 1925, and 13 million tons in 1924. The annual average quantity imported in 1909-13 was 10½ million tons.

The fear has sometimes been expressed that the development of the deposits of coal in Spitzbergen, and competition from German and Polish coal would have serious effects on the predominance of British coal in these markets. With regard to the former, the maximum output has fallen short of half a million tons a year. With regard to the latter, competition has, indeed, been much keener since the end of 1924 when the output of German coal was freed from the restraint imposed by the M.I.C.U.M. Agreement (Mission Interallié de Control des Usines et Mines) following the occupation of the Ruhr. On the other hand, coal from the Upper Silesian mines, now ceded to Poland, is less accessible to the Baltic and Scandinavia to-day, since it depends upon Dantzig instead of Stettin, its natural port. Attempts are being made to overcome this difficulty by reduced rail freights.

At the end of 1923 the hydro-electric schemes completed furnished 1·8 million horse-power in Norway and 1·4 million horse-power in Sweden. These are considerably in excess of the pre-war figures, which were approximately 0·8 million horse-power and 0·7 million horse-power, respectively. This development is no doubt the result of the scantiness of fuel supplies during the war and the high prices in the years following. The same causes have led to the extended use of oil and timber as alternative fuels.

(e) Russia and the Succession States.

The British exports to these countries in the pre-war period and in recent years were as follows :—

<i>Annual Average :—</i>				<i>Tons.</i>
1909-13	..	..	..	4,112,000
<i>Year :—</i>				
1924	..	..	..	1,344,000
1925	..	..	..	927,000

In the years 1909-13 the Russian Empire, with an output of 28½ million tons of coal per annum, ranked as the fifth highest producer in the world. At that time, four-fifths of the coal consumed in the Empire was produced at home. The remaining fifth was equally divided between British and other imported coal.

The Dombrova coalfield, which was formerly Russian, is now ceded to Poland. Deducting the output of this coalfield, production in the others amounted to approximately 23 million tons in 1909-13. In the post-war period it was 9½ million tons in 1922, 10½ million tons in 1923, and 13½ million tons in 1924. In this year, therefore, the last for which information is available, the output of coal in Russia was not much more than one-half the corresponding pre-war quantity, though it is gradually increasing.

The same causes which have brought about this great reduction of output have also diminished the quantity of coal consumed. In the territories that were comprised in the Russian Empire before the war (so far as an estimate is practicable), the consumption of coal in 1924 was nearly 21 million tons, and during the first-half of 1925 at the rate of about 21½ million tons per annum. In 1909-13 it amounted to 34½ million tons per annum.

In 1924, the proportion of coal consumed in Russia and the Succession States, that was obtained from home sources, was more than 93 per cent. of the greatly diminished total, and the bulk of the coal imported was British. For 1925, particulars are available in respect of the first six months only, during which 96 per cent. of the quantity consumed was produced at home, and 3 per cent. was British.

During 1919-25, the export of British coal to the territory of Soviet Russia has declined, and we have been informed that this is the consequence of the policy adopted by the Russian Government, which prohibited entirely the import of coal into Russia.* But the loss on this account has been more than counterbalanced in recent years by increased quantities sent to the Succession States, in particular to Finland and to Latvia.

Great efforts were made in 1924 and 1925 to increase the exportation of coal from the Donetz coalfield, particularly to Italy, Greece, and Egypt ; but the measure of success was limited.

(f) *Italy.*

The British imports into Italy in the pre-war period and in recent years were as follows, (it has not been possible to make allowance for territorial changes) :—

<i>Annual average :—</i>	<i>Tons.</i>
1909-13	8,672,000
<i>Year :—</i>	
1924	5,811,000
1925 (estimated)	6,439,000

* Clark, Q. 1935.

The quantity of coal produced in Italy is negligible, though the war and the subsequent period of short supplies stimulated the exploitation of such small resources as exist.

The total annual imports in the post-war period into the territorial area of pre-war Italy were nearly 10 million tons, or practically the same as during the period 1909–13. Ninety per cent. was then British, but in recent years our share has fallen below two-thirds.

The Italian market is open to sources of supply that do not ordinarily find their way into the other principal European countries. In recent months Russian and Polish coal have found a market there. During 1920 and 1921, when European supplies were short, substantial quantities were imported from the United States of America, and a certain amount of American coal always finds its way there. But the chief competitor to which we have lost ground is Germany.

In 1909–13 Germany supplied Italy with rather less than 1 million tons of coal. The Treaty of Versailles gave Italy an option on German coal which, beginning at $4\frac{1}{2}$ million tons in the first year (1919–20), was to rise to $8\frac{1}{2}$ million tons in the fifth (1924–5) and subsequent years. Actually, the quantity delivered by Germany as Reparations amounted to 4 million tons in 1924, but during 1921–3 and in 1925 it was only half as much, on the average.

During the latter part of 1924, and during part of 1925, the operation of the Dawes Scheme effected a considerable reduction in Reparation coal deliveries. It was explained to us in evidence by the representative of the Treasury that this limitation will operate to a diminishing extent in each succeeding year as the German Annuities gradually increase. But the increase in the deliveries that may be made on Reparation Account are also limited by the amount of coal which Germany can spare for export. Further, the total Reparation payments withdrawn by the Allied Governments are not to be such as to weaken the German exchanges. In the view of the Treasury's representative, the future scale of payments actually withdrawn by the Allied Governments may not be very much larger than at present, and no substantial increase in Reparation coal deliveries is anticipated.*

Like other countries that possess a large potential supply of water-power there has been a considerable development of this during and since the war. At the end of 1923 the hydro-electric schemes completed furnished 1·5 million horse-power. Nevertheless, there has been no diminution in her total of imports of coal. These have been as follows :—

Year.	Tons.
1922	8,989,000
1923	9,020,000
1924	10,686,000
1925 (estimated)	9,699,000

* Leith-Ross, paras, 5(a) and 5(b), and Q. 2051.

In 1924 and 1925 allowance is made for imports into Trieste and Fiume (namely, 434,000 and 380,000 tons, respectively), separate particulars of which are not available for 1922 and 1923.

(g) *Spain.*

The British imports into Spain in the pre-war period and in recent years were as follows:—

<i>Annual Average:</i>	<i>Tons.</i>
1909-13	2,550,000
<i>Year:—</i>	
1924	1,450,000
1925 (based on January-June) ..	1,561,000

Before the war there was a steady demand for British coal amounting to 2½ million tons per annum. This represented nearly 40 per cent. of the total consumption of coal in Spain; practically the whole of the balance was produced in the country. As in other countries which were thrown upon their own resources during the war, Spain was forced to look to alternative sources and in her case there was considerable development of native coal resources. In the years 1923 and 1924 the output of Spanish coal was about 6 million tons a year, as compared with only 3½ million tons a year in the pre-war period. This sufficed to give her more than 80 per cent. of her total consumption. The balance was practically all supplied by Great Britain.

In 1922, the Spanish Government were pressed by the home producers of coal to protect their own industry. The most important step taken by the Government was the imposition of a duty of 7½ gold pesetas per 1,000 kilogrammes (or 6s. 1d. per ton) on imported coal. By a commercial treaty effected with Spain in the same year the duty was reduced to a rate of 4 gold pesetas per 1,000 kilogrammes (or 3s. 3d. per ton) on British coal up to a quantity not exceeding 750,000 tons a year.

The course of post-war pit-head prices of British and Spanish coal has been as follows:—

<i>Year.</i>	<i>British Coal.</i>	<i>Spanish Coal.</i>
	<i>Shillings per ton.</i>	
1921	26·19	34·67
1922	17·63	23·69
1923	18·82	19·19
1924	18·84	18·73

The reduction in Spanish values to the British level has been accompanied by frequent representations by the Asturian mine-owners against the tariff concession to British coal, and more than one Commission of enquiry has been set up by the Government to explore the possibilities of the situation. Towards the end of

1925 the Government furnished some financial assistance to the industry for a short period, the amount of which was not to exceed the produce of the import duties on coal.

(h) *United States of America.*

The output of bituminous coal and anthracite in the United States in the post-war years has varied greatly. There were protracted disputes in 1919, 1922 and 1925. The output in the pre-war period 1909–13 was 457½ million tons per annum, or two-fifths of the entire production of the world. In 1923 the production amounted to as much as 587½ million tons, and in the year preceding to only 426 million tons. In 1924, a year of fairly normal conditions, it was 510½ million tons, or approximately the same proportion of the world supply as in the pre-war period.

In spite of the vast resources of the United States, American coal has small significance for the coal industry of Europe in general, and for that of Great Britain in particular. As the following table shows, the production of coal in the United States in 1924 was 11½ per cent. higher than the annual pre-war average output, but the quantity exported was less than 5 per cent. of the quantity produced, and slightly less, both actually and relatively, than the quantity exported in 1909–13.

Table 25.

Period.	United States of America.			United Kingdom		
	Production of Bituminous Coal and Anthracite.	Quantity of Coal exported (including Foreign Bunkers).*	Percentage of Production.	Production of Bituminous Coal and Anthracite.	Quantity of Coal exported (including Foreign Bunkers).*	Percentage of Production.
<i>Annual average:—</i>	<i>Millions of tons.</i>			<i>Millions of tons.</i>		
1899–1903	263·51	7·72*	2·9	224·35	59·24	26·4
1909–1913	457·72	25·13	5·5	269·59	88·37	32·8
<i>Year:—</i>						
1913 ..	508·89	31·31	6·2	287·43	98·34	34·2
1922 ..	425·85	18·33	4·3	249·61	87·34	35·0
1923 ..	587·41	30·09	5·1	276·00	102·82	37·3
1924 ..	510·37	23·82	4·7	267·12	81·75	30·6
1925 ..	522·40	24·19	4·6	244·42	68·97	28·2

* Particulars of the coal shipped as foreign bunkers are not available prior to 1906.

The bulk of the coal exported from the United States is sent to Canada and other North American markets. It enters European markets in small quantities, and is a competitor of British coal in South America. In the pre-war years less than one million tons of American coal were exported annually to Europe (including Mediterranean countries) and South America. In 1923, the quantity was nearly three million tons; it fell to 2½ million tons in 1924, and to less than two million tons in 1925. During the past three years, exports to these markets represented one-tenth of the entire American coal exports. This is a marked change from 1920, when British exports were restricted, and 17½ million tons of American coal were exported to these destinations, or seven-tenths of their total imports. In that year the average value of British coal exported was nearly 80s. per ton—four times the average value of 1925. Indeed, the volume of American exports to Europe and South America will be found to vary very closely with the price of British coal.

The American bituminous coalfields contain large reserves of coal in suitable section for economic working, lying at or near the surface. Roof and floors are generally good, and the seams are relatively free from faults and gas. Machinery is freely used; the output cut by machines was 59 per cent. of the total in 1919, and 69½ per cent. in 1924. In 1909–13, it was 44½ per cent. The annual output per person employed was 700 tons in 1924, the same as in the period 1909–13. In years of exceptional demand, however, within the past 10 years, 800 tons, and in one year 841 tons per person per annum has been reached.

In the anthracite industry very little coal is cut by machines, but the output per person was 491 tons in 1924, and 528 tons in 1923, as compared with 449 tons in the pre-war period.

The price of bituminous coal has increased from 5·3s. per ton in 1909–13 to 11·1s. per ton in 1924, or a little more than double. Anthracite, which was 9·3s. per ton in the pre-war period, was 27·5s. per ton in 1924, or three times as much. This increase in the price of anthracite has recently furnished an opening for the export of British anthracite to North America, especially to Canada.

The *per capita* consumption of coal in the United States was 87 cwts. in 1924 and 88 cwts. in 1925; in 1909–13 it was 93 cwts. At the same time there has been considerable development of the water-power resources of North America where, at the end of 1923, 13½ million horse-power was actually developed. The increase in the production of electricity by water-power in the United States between 1920 and 1923 was about 20 per cent.

The production of petroleum has increased very rapidly. It amounted to 31 million tons per annum during 1909–13, and in 1924 had risen to more than 100 million tons.

The American resources of bituminous coal are large and the costs of production low. But the distance of the coalfields from the

seaports largely neutralises the lower costs of production in competition with British coal in overseas markets. At the prices prevailing in Europe to-day American competition is restricted to small dimensions. But, as has been shown, the volume of American exports quickly responds to any substantial rise in the British price.

(i) *Egypt.*

The British imports into Egypt for inland consumption and for bunkering purposes in the pre-war period and in recent years were as follows :—

	Imported for		
	Inland Consumption.	Bunkering purposes.	Total.
<i>Annual Average :—</i>	<i>Tons.</i>		
1909–13	1,426,000	1,425,000	2,851,000
<i>Year :—</i>			
1924	937,000	844,000	1,781,000
1925 (estimated)	1,194,000	803,000	1,997,000

The total amount imported from all sources in the pre-war period was 3·08 million tons per annum, on the average, and was divided almost equally between coal for inland consumption and bunker coal. In the year 1924 the quantity was 1·85 million tons per annum, still predominantly British, and still equally divided between coal for internal use and as bunker coal. In 1925, 1·25 million tons were imported for internal use, and 0·89 million tons for bunkering purposes.

The decline in the consumption of bunker coal is attributable to the substitution of fuel oil. This also accounts for part of the decline in the use of coal internally, but in the earlier post-war years the quantities imported were also affected by the accumulation of large stocks of locomotive coal in previous years.

Both before and since the war, relatively small quantities of coal were imported from the United States of America, and certain other countries (*e.g.*, Turkey). The Egyptian market appears not to be accessible to South African coal except in abnormal circumstances.

(j) *South Africa.*

The production of coal in South Africa, and her exports, have increased notably since the pre-war period. In the years 1924 and 1925, output was more than 11 million tons a year ; in the years 1909–13, it was 6½ million tons a year. The quantity exported had increased to 3½ million tons in 1923 and 1924 from an average of 1½ million tons in the years before the war.

The dislocation of world supplies of coal caused by the war furnished the South African mines with an opportunity for developing their resources, and in 1923 this movement was accentuated by the introduction of exceptionally low railway rates for Transvaal coal intended for export. The pre-war system of rebates was extended, and at the same time applied to coal for bunkering vessels carrying export coal.

This has had its effects not only on British coal exports to places east of Suez, but upon the Indian coal trade. The Government of India was led in 1924 to appoint a Committee of Inquiry into the measures which should be taken to stimulate the exportation of Indian coal.

(k) *South America.*

The British exports to these countries in the pre-war period and in recent years were as follows :—

<i>Annual Average :—</i>	<i>Tons.</i>
1909–13	7,168,000
<i>Year :—</i>	
1924	4,726,000
1925 (estimated)	4,632,000

A small quantity of coal is produced in South America, chiefly in Chile and Peru. Before the war, and the opening of the Panama Canal, some British coal penetrated to these States; in 1909–13 the quantity amounted to 865,000 tons per annum. In 1924 only 123,000 tons were so exported, and the present importance of South America for the British coal export trade is confined to the Atlantic States.

Amongst these, Brazil has a production of about half a million tons of coal a year, but broadly speaking the Atlantic States of South America depend upon imported coal. As is well known, since these countries furnish no inconsiderable portion of the world supplies of grain, meat and similar products, the vessels that carry coal there are assured of return cargoes, an arrangement which is economical and profitable to all concerned. This has been no small factor in the predominance in the past of British coal in South American markets on the Atlantic Seaboard.

In 1913, 7½ million tons of coal were exported to these markets by Great Britain and the United States of America, of which 93 per cent. was Great Britain's share. In the years 1923–25 the quantity has varied from 4½ to 5½ million tons, and the proportion of British coal from 82 to 89 per cent.

This is a great improvement on the earlier post-war years, when the quantity of coal exported from Great Britain and the United States to these markets was little more than 3 million tons per annum, a large proportion of which was supplied by America. In this connection the following figures are interesting.

They have been supplied to us by the courtesy of the chief Argentine Railway Companies. They show the respective quantities of coal and fuel oil used in each of the last eight years. (The calorific value of one ton of fuel oil is assumed to equal that of $1\frac{1}{4}$ tons of coal.)

Table 26.

Period.	Total Quantity of Fuel used (in terms of of Coal).	Oil used.		Coal used.	
		Quantity.	Percentage of all Fuel.	Quantity.	Percentage of all Fuel.
	Tons.	Tons.	%	Tons.	%
<i>Annual Average</i> — 1909-13	977,600	—	—	977,600	100·0
<i>Year ended 30th June</i> —					
1918	365,400	5,500	1·9	358,500	98·1
1919	318,400	17,500	6·9	296,400	93·1
1920	587,400	48,700	10·4	526,500	89·6
1921	803,900	112,000	14·4	663,800	82·6
1922	913,300	172,500	23·6	697,700	76·4
1923	1,103,400	234,400	26·6	810,400	73·4
1924	1,197,800	257,800	26·9	875,500	73·1
1925	1,233,100	212,100	21·5	968,000	78·5

These figures indicate ; first, a considerable diminution in the volume of railway traffic in the war years and those immediately following ; and secondly, a tendency, in the latter part of this period, to turn to oil fuel. In the year ended June, 1925, however, the quantity of coal used was nearly as great as it was in the pre-war years.

3. Working Results of Colliery Undertakings.*

The general results of the working of the coal mines of the whole of Great Britain arranged by size of undertaking, *i.e.*, yearly output commercially disposable, for the first six months of 1925 are given in Chapter V of the Report itself (Table 5). The following table gives corresponding figures, for the year 1923:—

Table 27.

*Working Results of Colliery Undertakings of Various Sizes.
Great Britain.—January to December, 1923.*

Yearly Output of Undertaking, 1,000 Tons.	Number of Undertakings.	Tonnage Raised.		Output per Man-shift.	Proceeds.	Costs.	Profit (+) or Loss (-).
		Total 1,000 Tons.	Percentage of Total.				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Cwts.	Sh. per Ton.	Sh. per Ton.	Sh. per Ton.
Less than 5 ..	12	39	—	9·40	24·77	49·70	-24·93
5 & under 200	307	26,914	11·2	16·10	19·93	18·96	+ 0·97
200 .. 400	141	39,152	16·3	17·16	19·44	18·02	+ 1·42
400 .. 600	78	38,520	16·1	17·97	19·43	17·71	+ 1·72
600 .. 800	34	23,402	9·8	18·40	19·20	16·77	+ 2·43
800 .. 1,000	28	25,771	10·7	19·07	20·10	17·23	+ 2·87
1,000 .. 2,000	44	60,115	25·1	18·95	20·05	17·50	+ 2·55
2,000 and over	9	25,861	10·8	19·22	20·65	17·50	+ 3·15
All	653	239,774	100·0	18·10	19·83	17·70	+ 2·13

Notes.—The tonnage referred to throughout is tonnage commercially disposable, except in column 5, where the figure is that of coal (pithead weight) produced per man-shift worked, including mines and miners' consumption. The total tonnage of commercially disposable coal raised by all mines in the period was 252,700,000, so that the mines included in the table cover 95 per cent. of the whole.

This table shows how proceeds per ton, costs per ton, profit per ton, and output per man-shift vary for undertakings of different size. For instance, 26,914,000 tons were raised by 307 undertakings, the yearly output of which lay between 5,000 and 200,000 tons. The average profit made on this output of coal was 0·97 shillings per ton. Again, the average profit made on the 60,115,000 tons raised by 44 undertakings with a yearly output of 1,000,000 to 2,000,000 tons, was 2·55 shillings per ton. It is seen that on the whole the average output per man-shift and the average profit per ton increase, and the average costs per ton decrease, as the size of the undertaking increases. These increases and decreases, however, are not at the same rate throughout the whole range of

* Detailed tables are printed in Appendix No. 18.

size of undertakings. The influence of the size of undertaking on profits per ton, output per man-shift, and costs per ton appears to be greater for the smaller undertakings than for the larger undertakings.

Table 27 shows the general position for the whole of Great Britain, but masks the peculiarities of the different districts.

Table 28 shows the relation of profits per ton to size of undertaking, district by district. The facts conveyed by this table are more readily seen if the district profits per ton for the smaller and for the larger undertakings are compared with the district averages. If, in the first instance, the figures for 1923 for undertakings of output 5,000 to 200,000 and 200,000 to 400,000

*Table
Comparison by Districts of the*

Grade of Undertakings according to Yearly Rate of Output Commercially Disposable. (1,000 tons)	PROFIT (+) OR LOSS (—) PER TON							
	Durham.		Notts and Derby.		South Yorkshire.		Northum- berland.	
	1923.	1925.	1923.	1925.	1923.	1925.	1923.	1925.
Under 5	-20.37	—	+2.59	+1.06	—	-6.18	—	—
5 and under 200	+ 3.48	-2.67	+0.23	-0.23	+0.50	-0.85	+2.60	-3.00
200 .. 400	+ 2.86	-1.51	+2.36	-0.20	-1.30	-3.64	+2.55	-2.30
400 .. 600	+ 1.17	-1.14	+2.57	+0.99	+0.60	-1.27	+3.25	-0.90
600 .. 800	+ 5.90	-0.27	+1.32	+0.13	+3.91	+0.93	+2.25	-2.00
800 .. 1,000	+ 3.20	+0.95	+2.32	-0.80	+3.17	+0.99		-0.80
1,000 .. 2,000	+ 2.46	-0.54	+2.73	+1.76	+4.16	+1.74	+2.93	-0.10
2,000 and over.. ..	+ 2.45	-1.65	+3.67	+2.37	—	—		—
District average profit or loss (shillings).	+2.75	-0.81	+2.50	+0.93	+2.57	+0.40	+2.71	-1.28
District average size of undertakings (in 1923).	626		550		538		442	

respectively, are taken and compared with the district averages for all undertakings, it appears that 15 of the 18 figures show profits less than the district averages. The exceptions are Durham in respect both of undertakings from 5,000 to 200,000 and of undertakings from 200,000 to 400,000, and South Wales for undertakings from 200,000 to 400,000. In 1925, for undertakings of the same yearly rates of output, 17 out of the 18 figures are less than the corresponding district averages. The single exception is in Lancashire, Cheshire and North Staffs.

The tendency shown in Table 27 for profits per ton to be below the average in small undertakings is thus shown in more detail in Table 28.

28.

Relation of Profits per Ton to Size of Undertakings.

COMMERCIALLY DISPOSABLE (SHILLINGS).

S. Wales and Mon.		Scotland.		West Yorkshire.		Leicester, Cannock and Warwickshire.		Lancashire, Cheshire and North Staffs.	
1923.	1925.	1923.	1925.	1923.	1925.	1923.	1925.	1923.	1925.
-18.47	-12.66	- 4.83	-10.51	-225.55	—	—	—	+ 3.26	—
+ 1.71	- 2.30	+ 1.50	- 1.60	- 0.77	- 1.32	+ 1.03	+ 0.56	+ 0.49	- 0.32
+ 2.15	- 1.09	+ 2.00	- 0.88	+ 0.56	- 1.56	+ 1.63	+ 1.03	+ 0.45	- 0.12
+ 2.06	- 1.04	+ 2.68	+ 0.23	+ 2.50	+ 1.20	+ 2.35	+ 2.19	+ 0.75	+ 0.21
+ 1.06	-1.16	+4.78	- 1.02	+ 1.55	—	+ 3.22	+1.16	+ 0.91	- 0.17
+ 5.06		+2.02	- 0.85		-0.59	—	—		
+ 1.61	- 0.77	+ 2.71	- 0.83	+ 2.97	+ 1.44	—	—	- 0.31	- 1.27
+ 3.26	+ 0.74	+ 3.46	- 0.27	—	—	—	—	—	—
+ 2.08	- 0.88	+ 2.61	- 0.75	+ 1.69	+ 0.27	+ 2.02	+ 1.39	+ 0.53	- 0.22
390		330		317		309		253	

Table 29.
Comparison by Districts of Costs per Ton of Smaller and Larger Undertakings with all Undertakings,
for Two Years, 1923, 1925.

(1) District.	1923 (Jan.-Dec.).					1925 (Jan.-June).				
	(2) Under- takings with Yearly Output 5,000 to 400,000 Tons.	(3) All Under- takings.	(4) Under- takings with Yearly Output more than 1,000,000 Tons.	(5) Col. (2) — Col. (3)	(6) Col. (4) — Col. (3)	(7) Under- takings with Yearly Output 5,000 to 400,000 Tons.	(8) All Under- takings.	(9) Under- takings with Yearly Output more than 1,000,000 Tons.	(10) (Col. 7) — Col. (8)	(11) Col. (9) — Col. (8)
	Shillings per Ton.					Shillings per Ton.				
Scotland	17·68	17·30	17·36	+0·38	+0·06	17·30	16·92	16·92	+0·38	—
Northumberland ..	18·32	18·36	18·84	-0·04	+0·48	18·06	17·03	15·86	+1·03	-1·17
Durham	17·85	18·38	18·55	-0·53	+0·15	18·90	17·95	17·88	+0·95	-0·07
South Wales and Mon.	21·43	19·93	19·85	+1·50	-0·08	22·84	20·68	19·63	+1·15	-1·05
South Yorks. ..	18·86	15·94	14·88	+2·92	-1·06	19·70	16·73	15·80	+2·97	-0·93
West Yorks. ..	18·32	17·33	16·61	+0·99	-0·72	19·62	18·34	17·58	+1·28	-0·76
Notts. and Derby..	16·13	15·04	14·48	+2·25	-0·56	17·99	16·13	14·93	+3·82	-1·20
Leicester, Cannock and Warwick	15·84	15·44	†	+0·40	†	17·13	16·96	†	+0·17	†
Lancs., Cheshire and N. Staffs.	19·05	18·71	18·98	+0·34	+0·27	21·13	20·82	20·79	+0·31	-0·03
Great Britain ..	18·40	17·70	17·50	+0·70	-0·20	19·65	18·23	17·38	+1·42	-0·85

† In the Leicester district there were no undertakings with a yearly output exceeding 1,000,000 tons.

Table 29 shows the influence of size of undertaking on costs, district by district, by comparing with the average for all undertakings the costs of small undertakings with less than 400,000 tons yearly output and of large undertakings with 1,000,000 tons and more, respectively. It will be seen that in 1925, the smaller undertakings have a cost of production 1·42 shillings per ton greater than the average and that there is an excess in every district. The larger undertakings which, as representing a larger proportion of the total output, will naturally be nearer to the average, have costs ·85 shillings below the average; some saving is found in nearly every district. The results for 1923 are not quite so uniform or striking, but are of the same character.

The relationship between size of undertaking and profitability, as shown in the foregoing tables, is not a simple or uniform one. Many other factors are at work; in particular, the variation in the price per ton obtained where a colliery is working a class of coal which realises a high price, or where costs per ton are low or output per manshift high because it is working a particularly easy seam.

Table 6 in Chapter V of the Report, showing the numbers of undertakings grouped by size and profitability in 1925, brings out the striking fact that, while the smaller undertakings include almost the whole of the least profitable ones, they have also more than a fair proportion of the most profitable ones. This appears also from a similar table given for 1923 below.

Table 30.
Losses and Profits by Size of Undertaking
(Number of Undertakings) 1923.

Yearly Output of Commercially Disposable Coal (1,000 tons).	Total Number of Undertakings.	Number of Undertakings making a loss per ton of					Number of Undertakings making a profit per ton of				
		7s. and over.	5s. to 7s.	3s. to 5s.	1s. to 3s.	Under 1s.	Under 1s.	1s. to 3s.	3s. to 5s.	5s. to 7s.	7s. and over.
Under 5	12	7	—	—	1	1	—	1	2	—	—
5 and under 200	307	9	15	16	45	40	48	76	37	12	9
200 400	141	—	—	8	12	18	19	49	27	6	2
400 600	78	—	—	—	6	10	14	29	15	4	—
600 800	34	—	—	—	—	4	5	13	7	4	1
800 1000	28	—	—	—	—	1	—	15	11	1	—
1000 2000	44	—	—	—	1	3	3	17	15	5	—
2000 and over ..	9	—	—	—	—	—	—	3	6	—	—
Total	653	16	15	24	65	77	89	203	120	32	12

In 1923, when the average profit was 2·13 shillings per ton for the whole of Great Britain, there were 55 undertakings out of

653 which made a loss of more than 3s. per ton, and all these were small undertakings having less than 400,000 tons output per year. At the same time, 44 of these 653 undertakings made a profit of more than 5s. per ton, and of these 29 were small undertakings with an output of less than 400,000 tons.

In considering the foregoing results regard must be had to the fact that they relate to undertakings. But undertakings may consist of (1) single mines, (2) two or more large mines working together, or (3) of a number of separate mines simply working under unified ownership. It might therefore be said that the greater profitability of the large undertakings may be due more to their containing one or two large mines than to their consisting of many small mines.

It has not been possible to test completely this point, but a comparison of single mine undertakings with multiple mine undertakings shows that the general tendency of profitability to increase with size still holds with the multiple undertakings. There can, in any case, be no doubt as to the greater efficiency of the bigger mines as such. This comes out clearly from another set of returns† obtained direct from the collieries and showing for twelve months to June 1925, the output per man-shift worked at the face, below ground and above and below ground. The results may be summarised as follows :—

Table 31.

Mines Employing.	Output of Saleable Coal in Cwts. per Man-Shift.		
	At Coal Face.	Below Ground.	Above and Below Ground.
Less than 50 workpeople.. ..	30·68	20·99	16·58
50 and under 500 workpeople ..	39·75	21·91	16·89
500 and under 1,000 workpeople	42·76	21·84	17·22
1,000 workpeople and over. ..	47·85	22·80	18·19
All Mines	44·87	22·39	17·70

These figures relate to the country as a whole. The figures for separate districts show a similar tendency for output per man-shift to increase with the numbers employed, almost without exception in respect of man-shifts at the coal face, and rather less regularly when other workers are included. The latter figures may of course be complicated by variations of the practice of collieries in screening and washing coal, and employing labour for the purpose.

† Table 12, Appendix No. 18.

Another point to be considered is that of the age of the mines. Newer mines are likely as a rule to be at a more productive stage than old ones, and in so far as the newer mines are also larger, this might account in part for the apparent relation between size and efficiency. Mines employing 3,000 persons and over have, in fact, an average age (38 years) somewhat below the average of 43 years for all mines. Those employing from 2,500 to 3,000 persons, however, are well above the average in age; the whole group employing more than 2,500 is just at the average age. This point, therefore, is of little importance.

4. Output, Classes Employed, and Hours of Work at various Dates.

The table printed below gives more fully the figures as to numbers of various classes of workers and their comparative output in 1905 and 1924 to which reference is made in the chapter on Output. The notes explain how the figures are obtained.

Table 32.

Coal Mining Output in Great Britain in 1905 and 1924.

	1905.	1924.	Change per cent. from 1905 to 1924.
1. Saleable coal raised (million tons)	233·1	267·1	+15
2. Persons employed (thousands)—			
(a) Above and below ground	837·1	1213·7	+45
(b) On surface	163·3	247·6	+52
(c) Below ground	673·8	966·1	+43
(d) At face	389·5	495·6	+27
(e) Others below ground ..	284·3	470·5	+65
3. Face workers per cent. of all underground	57·8	51·3	—
4. Annual output in tons per person employed—			
(a) Above and below ground	278	220	—21
(b) Below ground	346	276	—20
(c) At face	598	539	—10
5. Time underground (all workers)	8 h. 57 m.	7 h. 28 m.	—17
6. Net working time (face workers)	7 h. 10 m.	5 h. 51 m.	—18

Items 1, 2 (a), (b) and (c), 4 (a) and (b) are taken from the Annual Returns of Mines, except that the total of all coal raised in 1905 is adjusted (by a reduction of about 3 million tons) to make it comparable with that in 1924 which is for saleable coal.

Items 2 (d) and (e) are calculated from the percentages in item 3. This percentage in 1905 is based directly on the Eight Hours Day Committee returns. For 1924 it is derived from returns received from the collieries as to the numbers of workers of various classes in October 1913 and October 1924 respectively.

Item 4 (c) is got by dividing the figures in item 1 by those in item 2 (d). Similar results are obtained if the figures in item 4 (b) are divided by ·578 in 1905 and ·513 in 1924.

Another calculation based on numbers of man-shifts worked, suggests that a rather smaller proportion of workers were employed at the coal face in 1924. The proportion of man-shifts worked at the face in that year was 49·8 per cent. of all man-shifts worked underground, and when corrected by allowance for the higher

rate of absenteeism among face workers, the resulting figure is about 50 per cent. of all underground workers. If this figure be used the output per face worker in 1924 becomes 552 tons, and the percentage reduction since 1905 becomes 8 instead of 10.

The two calculations confirm one another within the limits of error. The figure used in the table has the advantage of being based directly upon the number of workers employed at the coal face.

In items 5 and 6, the total underground time and the net working time at the face in 1905 are calculated from the Eight Hours Day Committee returns, on the basis of the hours and estimated numbers of each class of worker in each district. The times for 1924 are calculated on the assumptions :—

- (a) That the Seven Hours Act reduced to seven hours plus one winding time the hours underground of all workers whose hours were greater than that, leaving workers already below the new limit of hours as in Durham unaffected.
- (b) That meal and travelling times in each district remain unaltered from 1905.

The basis of these calculations is set out fully below.

It may be added that of the total reduction of 79 minutes working time at the face, 32 is due to the Eight Hours Act and 47 to the Seven Hours Act. Of the total reduction of 89 minutes in underground time of all workers 38 minutes is due to the Eight Hours Act and 51 to the Seven Hours Act.

Calculation of Hours Underground.

The estimates made in the Report as to hours underground and net working time at the face in 1905, after the Eight Hours Act, and after the Seven Hours Act, are reached as follows :—

The estimate for 1905 is based on the returns made to the Miners' Eight Hours Day Committee, the results of which are published in Part II of their Report (Cd. 3427). Unfortunately both the forms in which the returns were asked for from the collieries and their subsequent treatment were defective in important particulars. Thus the collieries were simply asked to give the hours "bank to bank"; they were left to interpret this and did interpret it quite differently, some including and some excluding winding times. Again, the return when received was averaged by collieries each reckoned as a unit, without reference to the numbers employed; this leads to considerable differences between averages for the whole country as given by the Committee in their United Kingdom Table II, and averages worked out from the numbers employed district by district (Table I). There are other figures in the tables as printed, notably those professing to give the net working time of all classes underground, which are obviously incorrect as they allow nothing at all for travelling.

As to the first point, it is only possible to trust, as the Committee trusted, that opposite errors roughly neutralise one another. As to the second point, it seems possible to improve upon the averages given by the Committee for the whole of the United Kingdom (weighted by collieries) by taking the separate averages given by them for each class of workmen and each district and weighting by the numbers in that class and district. In so far as it may be fairly assumed that there would be a certain tendency to uniformity within each district, it is possible, by weighting the resulting district averages by numbers of men, to get nearer to an average for the whole country by numbers of men throughout.

This has been done accordingly both for the total time underground and for the net working time at the face of those employed there. There results, as the average time underground for all classes of workpeople, 8 hrs. 57 min. as compared with 9 hrs. 3 min. given by the Committee. There results as the net working time at the face 7 hrs. 10 min. as compared with 6 hrs. 57 min. given by the Committee for hewers alone, and longer periods up to 7 hrs. 32 min. given for the three other classes employed at the face.

These results, which are used in the table above, derive some confirmation from an independent calculation based upon Table V of the Committee's Report. From this an average of 8 hrs. 53 min. underground is estimated for workers of all classes, and 7 hrs. 6 min. net working time for workers at the face. This calculation depends upon the mean values to be assigned to the time groups not precisely defined under which the workers are distributed; it is in both cases nearer to the figures used in the table above than to those of the Eight Hours Committee.

Generally, while the estimates made above cannot be submitted as having any pretensions to accuracy within a few minutes, they are, for the reasons given, almost certainly nearer the truth than those published in the Committee's report.

In calculating this it has been assumed that, after the Eight Hours Act, the time underground of all classes of workers was eight hours plus one winding time, except in the case of those workers whose time was already shorter than this, and who have been assumed to continue to enjoy their shorter hours. The mean winding time for each district has been obtained from the table given by Sir Richard Redmayne to the Commission of 1919 (Vol. III, p. 44), showing for each district the winding time authorised, and the numbers of men affected, in groups at five-minute intervals. Each group has been assumed to be at the middle of the interval, and the mean time for the division thus weighted by the numbers of men in each group has been calculated. The areas in Sir Richard Redmayne's table have been grouped to correspond as nearly as possible with the districts

of 1905 (it being assumed for purposes of distribution that 34 per cent. of the men employed in Lanark were included in East Scotland and the remainder in West Scotland).

There results, as the average winding time for the whole country, 36 mins., the district figures ranging from 20 min. in Northumberland and Cumberland to 47 minutes in Denbigh and Flint.

In arriving at the winding time to be permitted, the Inspectors add 25 per cent. to the time actually observed by them, as a margin for contingences. In calculating the actual time spent underground on account of winding time, this margin has been taken off again; that is to say, the average winding times for each district, as deduced from Sir Richard Redmayne's table, have been reduced by one-fifth. The resulting winding times and actual times assumed in the present calculation are set out below. It will be seen that the average actual time for the whole country is 29 minutes.

Table 33

District (1905).	Average Winding time (1918). Min.	Average Actual time (1918). Min.	Average Winding Time (1925) (Mining Association Return) Min.
East Scotland	34	27	32
West Scotland	32	26	
Northumberland and Cumberland	20	16	26
Durham	23	18	32
Yorks	41	33	35
Manchester and Ireland	44	35	41
West Lancashire and Cheshire ..	44	35	
Denbigh and Flint	47	38	46
Midlands	41	33	43
Staffs	33	26	36
Cardiff	39	31	36
Swansea	39	31	
Monmouth	39	31	
Bristol, Somerset, Forest of Dean	40	32	38
Mean for all districts weighted by numbers of men in each district.	36	29	36

The actual time spent underground, however, after the Eight Hours Act would not on an average be 8 hours 29 minutes, because large numbers of men in Northumberland and Durham and some in Yorkshire were already working less than eight hours, plus one winding time. The actual time underground and the working time at the face have accordingly been calculated by assuming that each man in each district was underground either eight hours, plus actual time to be added for winding in his district, or his previous hours, whichever was the lower number. On this assumption the mean total time underground for all classes after the Eight Hours Act works out at 8 hours 19 minutes,

representing a reduction of 38 minutes on the figure of 8 hours 57 minutes calculated above. Assuming no change in travelling time and meal time, the reduction of net working time at the face calculated in the same manner for face workers alone is 32 minutes, from 7 hours 10 minutes to 6 hours 38 minutes.

The effect of the Seven Hours Act has been calculated in the same way as that for the Eight Hours Act, using the same mean winding time and weighting each class and district by the numbers employed in 1905. The resulting time of all classes underground is 7 hours 28 minutes and the net working time at the face is 5 hours 51 minutes.

A similar calculation weighting by the numbers employed in 1924 in each class and district gives a similar figure to that shown above for all classes of workers employed underground, and 5 hours 53 minutes net working time at the coal face.

The foregoing results are obviously approximate only; the main difficulty in them is that in default of information it is necessary to assume that the total of the travelling time, meal-time and other unproductive time spent below have remained constant. This is not likely to be the case; probably the unproductive time spent below has decreased somewhat with the reduction of working hours. It may be added that, according to the Mining Association, the deduction to be made from total time underground for unproductive time is greater than that allowed by the Eight Hours Day Committee. This argument appears to rest on a very narrow basis of evidence (Mr. Bramwell's observations on seven particular collieries submitted to the Commission of 1919). If it be accepted, it would, by giving a lower figure for the net working time in 1905, increase the percentage by which this working time has been reduced since 1905. It seems safer to set this possibility against the other possibility that the reduction of total time underground has led men to reduce also their unproductive time underground.

In view of the margins of error in the material available the figures used in the Report itself (particularly in the chapter on Hours) have been rounded up. Thus, the time underground in 1905 has been put at 9 hours in place of 8 hours 57 minutes as above; the time after the Eight Hours Act at 8 hours 20 minutes in place of 8 hours 19 minutes; and the time after the Seven Hours Act at 7 hours 30 minutes, in place of 7 hours 28 minutes.

5. Review by Major H. M. Hudspeth, Mining Assessor to the Commission, of the Reports made of Investigations into complaints of inefficiency at individual mines made by the Miners' Federation of Great Britain.

(A synopsis of the reports is printed in Appendix No. 40.)

Underground Travelling.

The chief general complaint was of long distance travelling underground on foot. Cases where the walking distances were considered to be excessive were put forward in each district.

The provision of riding facilities in old mines is often a difficult matter, owing to the varying inclination and tortuous nature of the roads, and it is doubtless well-nigh impossible, in some of the cases investigated, economically to adopt means for transporting workmen; but had this matter been kept in view in the past the present "impossible" conditions would not have resulted. It is short-sighted so to develop mines as to preclude the economical possibility of men being conveyed to their working places where they are situated, as in one of the cases investigated, at over an hour's walking distance from the shaft. The longer the distance over which riding facilities can be provided the greater is the saving in time and fatigue.

Opinions differ as to the distance at which the conveyance of men becomes an economy, but, so far as time saving is concerned, the limit, except where roads are steeply inclined, is greater than one mile. At the same time reduction of fatigue is of great importance, and it is in this respect that the question of riding will doubtless receive more consideration in the future than it has done hitherto.

At one mine inspected the workmen considered half a mile as being too far to walk. The maximum distance travelled on foot at any mine investigated was 4,305 yards, in one direction, which occupied some 61 minutes, *i.e.*, over two hours travelling time each day underground. The mine is old and said to have tortuous roads generally unsuitable for riding. Where such long distances exist it should surely be possible to devise some means whereby time and fatigue can be saved. At some mines the men are conveyed by means of horse haulage.

Care for the safety of workmen has deterred the provision of riding facilities in some instances, and there are admittedly certain risks to be encountered. These, however, may be less serious than those taken by workmen when travelling haulage roads on foot.

Any means whereby the effective time spent at the coal face can be increased, and the unnecessary fatigue of travelling reduced, should obviously be adopted unless it increases the risk of accident or the cost of making the necessary provision is prohibitive.

Shortage of Tubs and other Materials.

The complaints relating to the failure of the management to supply the hewer with sufficient tubs and materials to enable him to attain the best results were numerous; but the investigations demonstrate that, while there has doubtless been some loss of output, the charges of inefficiency in these respects have little foundation except in regard to tubs.

This is particularly the case when considering such complaints as refer to shortage of rails, timber, etc., which in the main appear to be based on occasional and temporary shortages experienced by individual workmen whose requirements are met on demand. It must always be remembered that an excessive supply of such materials inevitably leads to loss and waste.

Shortages of power—compressed air, and in one case steam—were complained of. The latter was admitted as occasionally occurring at a mine where nine low-pressure Lancashire boilers are in use to deal with an output of 630 tons per day—an apparently wasteful arrangement.

Complaints as to shortages included electric safety lamps. Men should not have to wait unduly for lamps being issued—each man should have the same lamp daily. Use of the same lamps for more than one shift per day tends to result in their not receiving the care and attention in examination and cleaning which are essential. Good lighting is of the utmost importance and there should be no ground for such a complaint as was made at another mine that lamps were in bad repair. Only seven lamps were under repair out of a total of 1,769, which suggests that the 1,762 would not all be in the best condition. Evidence that on two occasions only half the lamps were alight in one district of the mine was not disputed.

The question of tub shortage is one of much concern to the miner, and it has apparently been the subject of frequent deputations to managers.

It is generally admitted that it is impossible to ensure that empty tubs are always available, in every working place, owing to the very many factors governing the distribution of tubs underground. The daily variation in the number of coal getters and clearance hands at work makes it extremely difficult for managers to provide against every contingency on every occasion.

There is evidence (1) that actual shortage in the number of tubs available existed in a few instances; (2) that tub shortages

have resulted from causes inherent to the employment of horses, which would have been avoided, and subsequently were avoided, by the use of mechanical haulage; (3) that the advancement of mechanical haulage appliances nearer to the coal face has resulted in a better supply of tubs; (4) that bad roads have hindered the proper transport of tubs to the face; and (5) that filling coal, at times when the mine is not winding coal, results in a reduction of the number of empty tubs available at the commencement of the day shift, as compared with the normal supply. The owners contend that in most cases the workmen have other work to do which normally keeps them fully employed until empty tubs are available. There is evidence, however, that such is not always the fact.

It is clear from the evidence that steps are not always taken to ensure a supply of empty tubs for all workmen at the commencement of the day shift; but that arrangements are made at some mines whereby the winding shafts are kept as near to their capacity limit as possible. This practice can conceivably, and does, result in a certain amount of temporary shortage, which, however, would not appear seriously to affect the total output.

There is evidence also of tub shortage and loss of output arising from want of railway wagons, a factor over which the owners generally have no control.

It must not be overlooked that interruptions of tub supply must inevitably occur, due to both human and mechanical agencies failing from time to time. To provide against all such emergencies is impossible, and it is necessary to bear in mind that a collier at the face has not the opportunity of differentiating between the causes of any deficiency in the supply of tubs. Tub shortages are, therefore, doubtless often complained of when the cause was due to circumstances beyond the reasonable control of the management. Apart from serious and continual shortages, of which there is no evidence, occasional hardship may result to individual workers, but opportunities of recovery are more numerous.

Ventilation and High Temperatures.

Several complaints dealing with bad ventilation and high temperatures appear to be not entirely groundless, but some complaints of high temperatures were not substantiated. The discomfort evidently found by the men is in consequence of the extremely moist condition of the air in the working places, due to lack of air movement, or, in other words, inefficient ventilation. At two mines men were found to be working under conditions where the wet bulb temperature was in excess of 80°. At one mine where men had to walk nearly 4,000 yards from the shaft to the face the temperatures in their working places were 88° dry and 84½° wet; humidity 83 per cent. It is impossible for men to give of their best under such conditions.

and it is difficult to believe that they cannot be improved. To allow such conditions to result is not indicative of the exercise of proper foresight on the part of those responsible.

Haulage Arrangements.

Hand haulage over long distances was the subject of frequent complaint. Certain conditions are favourable to hand haulage, but it seems unwarranted that hand haulage operations should be carried out over such distances as 660 yards or more. Other hand haulage distances complained of were 400 yards and 300 yards. It is suggested that it cannot generally be economical to have men handling tubs over such long distances.

Several complaints would never have been made had mechanical haulage been in use instead of horse haulage. Mechanical haulage is not necessarily the most economical under all circumstances, and there is evidence that horse haulage is being economically used over distances normally best suited to mechanical haulage. On the other hand, there is evidence of the advancement of mechanical haulage facilities being too long deferred and the capacity margin of such facilities being too small to allow for interruptions in the haulage service.

Other Causes of Complaint.

Certain complaints made in reference to old mines appear to have had no reasonable basis. It is a well-known fact that certain appliances not of a modern kind are not always uneconomic, and, although their use may appear to be evidence of inefficiency, it is not necessarily so. In any event, it would be foolish to put down new plant at a mine which is on the verge of extinction.

Many of the complaints refer to colliers being required to do other work than getting coal. Some of these were made with a view to indicating how the colliers' output could be increased. Such increase, however, is useless if it is countered, or more than countered, by a decrease in the output measured over all the other persons employed. At one mine the colliers objected to unloading rubbish into the waste, whereas at another they objected to rubbish going to the surface, and said it should be put in the waste. In some modern mines it is economically impossible to avoid colliers doing some other work than getting coal.

Bad roads were a frequent source of complaint, and in some instances the evidence is clear that the value of good roads and proper tub-ways is not fully appreciated. Bad roads are conducive to many ills—difficulty in tub distribution, discontent, waste of time, bad ventilation—and, generally, bad roads are uneconomical.

Some of the complaints referring to accidents to machinery, etc., were evidently only put forward to show that some loss

of output results from causes over which the workmen have no control, rather than as complaints against the management.

Other complaints centred round a bad lay-out and frequent changes of management. Numerous changes of management must result in lack of continuity of policy, and subsequent remedial measures, now indicated as being taken, seem to point to some previous deficiency.

Some complaints were made in regard to methods of work, and the evidence at one mine showed that bad conditions were made worse by the methods adopted, the main desire apparently being to get output at any cost.

The workmen's desire for pithead baths is indicated by their complaint that no baths were provided at one colliery.

Many of the complaints were trivial, while some were made on the basis of inaccurate knowledge, and there is no reason why the causes of discontent should not have been removed by co-operation on the part of owners and men. Apart from the psychological effects, the results of which are hard to measure, the investigations show that nothing more than a very small reduction in output results from the causes enumerated.

6. Prices Paid for Coal by Coke Ovens.

The figures set out below were supplied by Lord Gainford at the request of the Commission, in amplification of evidence submitted by him on behalf of the National Association of Coke and By-Product Plant Owners. They give for 1913 and for two periods in 1925 (before and after the subsidy) the average price of coal at coke ovens, distinguishing ovens owned directly or indirectly by colliery companies alone, those owned by iron and steel firms alone, those owned by collieries and iron and steel firms combined, and those which are altogether independent. The prices are set out in the following table with an explanatory note as supplied by Lord Gainford.

Table 34.
Average Price of Coal at Ovens.

Coke Ovens owned Directly or Indirectly by	Year 1913.	Year 1925.	
		1st January to 31st July.	1st August to 31st October.
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
(a) Colliery companies alone	8 7·31	12 2·16	9 11·76
(b) Iron and steel firms alone	10 3·13	15 1·67	13 4·80
(c) Collieries and iron and steel firms combined.	11 0·17	14 5·54	11 9·27
(d) Independent plants ..	7 5·57	11 8·19	10 5·43

EXPLANATORY NOTE.

In comparing the prices of coal in 1913 with those in 1925, the variation in the quality of the coal must be borne in mind. A higher grade of fuel was probably used for coke-production in 1913 than is now used. In 1913 the fuel was more carefully selected and graded than it is to-day.

All the prices shown above are *at the ovens*, and consequently include railway rates and charges.

Class (a).—No railway rates or only short distance traffic rates;

Class (b) and (c) constitute the long distance traffic—*e.g.*, coking coal sent from Yorkshire to Scunthorpe in Lincolnshire, or from Durham to Skinningrove Ironworks in Cleveland;

Class (d) is mainly short distance traffic.

It will be seen that *Class (a)* prices (mostly transfer prices) in 1913 and to 31st July, 1925, exceeded *Class (d)* prices (open market prices); but the position was altered in the quarter ended 31st October, 1925. This may be accounted for by different qualities of coal or by the fact that *Class (d)* would be supplied on prior contracts at higher prices than the *monthly* market price. In 1913, moreover, the owners' accountants in the county of Durham based the prices ascertained on the selling price of coke, making an allowance therefrom for the cost of manufacturing the coal into coke.

The variation in the Class (b) and (c) prices is accounted for by the shifting of the source of supply, affecting both the price and the railway rate.

The average railway rate cost per ton in the case of Class (b) would generally be rather higher than in the case of Class (c).

The incidence of the 2d. per ton flat railway rate addition has also so affected the position in 1925 that no true comparison can be obtained with 1913.

It is suggested that it might be misleading to draw any definite conclusions from the figures given above, as the average cost per ton of railway rates and charges in each instance are not available, nor can they be now accurately ascertained.

The prices, being those paid for delivery at the ovens, include the cost of transport where necessary; they are higher at ovens connected with iron and steel firms (since these are placed as a rule near the furnaces rather than near the mines) than at ovens owned by collieries, or at independent ovens which would naturally be near some source of supply.

If these differences are eliminated as far as possible, by reducing the prices to index-numbers and representing the price for each separate class of undertaking in 1913 as 100, the following table is obtained:—

Table 35.

Changes in Price of Coking Coal at Ovens (1913 price = 100).

Coke Ovens owned Directly or Indirectly by	Year 1913.	Year 1925.	
		1st January, to 31st July.	1st August, to 31st October.
(a) Colliery companies alone	100	142	116
(b) Iron and steel firms alone	100	148	131
(c) Collieries and iron and steel firms combined.	100	131	107
(d) Independent plants ..	100	157	140

From this it appears that, comparing 1913 with the first seven months of 1925 (before the subsidy), the price paid by the coke ovens had risen most in the case of independent plants (57 per cent.). In the case of the plants connected with iron and steel firms, but not connected with collieries, it had risen 48 per cent., and in the case of the plants connected with colliery companies but not with iron and steel works, 42 per cent.; finally, the plants connected both with collieries and iron and steel firms show a rise of only 31 per cent. If we look at the period of three months since the subsidy from 1st August, 1925, to 31st October, 1925, the order of increases is the same, but the difference between the plants independent of collieries and those connected with

collieries is even more marked. The transfer prices have been put down at once as a result of the subsidy, whilst the prices paid by independent plants have kept up, presumably because of prices under long contracts.

It is perhaps not possible to draw conclusive inferences from these figures, but it is clear that the prices paid by ovens independent of collieries have risen more since 1913 than prices paid at ovens associated with collieries, and it is difficult to see how this can be accounted for either by changes in freight-charges or by differences in the quality of the coal. So far as the qualities of coal are concerned Lord Gainford stated in evidence that there was no substantial difference in the kinds of coal used by the different classes of coke ovens. (Q. 14706.)

As regards freight, if one compares classes (a) and (d), in both of which the railway charges are small, the prices paid by the independent plants are found to have risen more than the prices paid by the associated plants. If one then compares (b) and (c), in which the railway charges are large, the same relation holds; that is to say, the plants independent of collieries have to pay relatively more for their coal in 1925 than in 1913, as compared with the associated plants.

As compared with 1913, the figures do appear to show a tendency for associated selling prices now to be depressed relatively to independent prices. There remains the question whether the 1913 prices can be regarded as a fair standard of comparison. On this the following further notes have been furnished by Lord Gainford :—

“ On the evening before I gave evidence a communication was received from the Secretary to the Coal Commission asking us to produce figures of transfer prices for the year 1913 with a view of comparing them with transfer prices for the seven months ending 31st July, 1925, and the three months ending 31st October, 1925, divided up over the four categories referred to in para. 7 of my proof of evidence. Mr. Smithson got into telephonic communication with his office, and I informed the Commission on the following morning that I would be glad to place before the Commission any figures which were in our possession. I had in mind at the time that the figures in the possession of the Coke and By-Product Plant Owners' Association for the year 1913 would be of little value to the Commission, but I was anxious to give the Commission any figures which were in our possession.

“ On investigation, we find that not only was there no object for the ascertainment of any transfer prices from the members in our association for 1913, but that the figures which we happen to possess were those obtained for the Balfour Committee, and related to the delivered prices into ovens for all classes of coal used in the manufacture of coke. The method of fixing the prices by various undertakings differed in every undertaking in 1913, and therefore it is quite impossible to give any information which is of any use whatever to the Commission in connection with the

prices in 1913, to compare with the prices in 1925. As an illustration, may I point out that Messrs. Pease & Partners in 1913, being probably the largest producers of coke in the country at that time, transferred their coals in their east collieries according to the price of *washed duff* realised at the pit for the transfer to their ovens of another quality of coal which was drysmall; that at their west collieries they transferred all the coal to their ovens *at the cost price of all the coal produced at the collieries.*

"No figures are now available which can possibly be sent to the Commission which can in any way enable them to compare transfer prices of 1913 with those of 1925.

"In regard to the figures for 1925, it is found that they varied considerably between one undertaking and another owing to special circumstances of each undertaking, such as varying railway rates, qualities of material, private wagons, etc., that we are convinced that no conclusion can be drawn from a comparison of these figures.

"We think the only way in which it is possible for transfer prices to be checked must be by full information being afforded to the accountants to enable them to judge as to the fairness of transfer prices produced and to enable any adjustment to be made which they think necessary, in accordance with the evidence which they have already given before the Commissioners.

"You will appreciate the point that as each coking plant varies and the character of coal varies, in addition to other circumstances, such as supplying to own ovens washed coal and purchasing unwashed; or supplying unwashed and purchasing washed coal; or again, that coking values of the coal supplied or purchased greatly differ; it is essential that all these and other minute but material particulars could be gone into only by the joint accountants, as any figures which we can produce would not otherwise be understood and would merely be misleading."

7. Miners' Wages and the Cost of Living.

During the second half of 1925 coal mining wages throughout Great Britain, except in the small district of Radstock, were at the minimum of the 1924 agreement. The average wage per shift worked during that period was 10·42 shillings, as compared with 6·47 shillings in June, 1914, an increase of 61·0 per cent. The cost of living index prepared by the Ministry of Labour, shows for the same period an increase above July, 1914, of 75·0† per cent. For the purpose of comparisons between the present and the pre-war conditions of miners, various corrections and qualifications need to be applied to these figures.

First, the average wage per shift given above is a crude average, taking all classes of persons employed in mining together, skilled and unskilled, underground and surface, adult and non-adult; it makes no allowance for changes in the proportions of the different classes, due to changed methods of working or other causes.

Actually, the less skilled and less highly paid classes of workmen have increased in numbers since 1914 more rapidly than the others. In order to get a fair comparison for present purposes, it is necessary to use a standardised average, *i.e.*, one weighted by the proportionate number in each class at some one date. This shows how much on the whole each main class of workmen has increased its wages.

The wages per shift for the main classes of workpeople in June, 1914, are given in the Appendix to the Report of the Commission of 1919 (Vol. III), and corresponding figures for September, 1923, are printed in Appendix No. 26, Vol. 3 of our Report. From the latter, the wages per shift for each class and district can be estimated within small limits of error for the second half of 1925. Using these figures, the standardised average increase from June, 1914, to the second half of 1925 is 63·5 per cent. if weighted by numbers employed in 1914, and 64·2 per cent. if weighted by numbers employed in September, 1923. The mean of these two standardised averages is 63·9 per cent., as compared with the crude average increase of 61·0 per cent.

Second, the wages of June, 1914, cannot be taken as typical of pre-war conditions in coal mining. That industry, even more than most industries, has always been subject to alternations of prosperity and depression, and wages have fluctuated accordingly. In the years just before the war, up to 1913, mining wages rose rapidly during a boom, certainly more rapidly than in other industries, such as engineering, textiles and building, for which figures are available. In the first half of 1914 there was a small decline, which would presumably have continued further

† Taking, as the average for each month, the mean of the figures applying to the beginning and end of the month.

as depression succeeded to the boom; the wages in that year remained well above the average of the five years 1909–13.

The average standard rates of hewers' wages in each of these years and their average for the five years, as compared with July, 1914, taken as 100, were as follows:—

Table 36.

District.	Mean of						July, 1914.
	1909.	1910.	1911.	1912.	1913.	1909– 13.	
Northumberland	89·4	86·3	83·8	86·6	96·2	88·5	100·0
Durham	92·1	89·2	89·3	90·1	98·6	91·8	100·0
Federated District and South Staf- fordshire.	91·6	90·9	90·9	91·4	99·4	92·8	100·0
South Wales and Monmouth.	94·7	93·6	94·0	95·7	99·2	95·4	100·0
Scotland	84·1	83·5	83·5	87·2	101·0	87·9	100·0
Average of above districts.	91·2	89·9	89·9	91·2	99·2	92·3	100·0

The corresponding figures for rates of wages in certain other industries are as follows:—

Table 37.

Industry.	Mean of						July, 1914.
	1909.	1910.	1911.	1912.	1913.	1909– 13.	
Building	93·7	93·7	93·7	94·3	96·3	94·3	100·0
Engineering ..	95·4	95·6	95·5	97·7	99·1	96·9	100·0
Textiles	96·6	95·8	95·8	97·5	99·6	97·1	100·0
Agriculture ..	90·9	91·3	92·0	93·2	95·6	92·6	100·0

The average for each year is taken as the mean of the rates current at its beginning and end.

The figures given in the two preceding tables represent rates of pay for a given unit of time or quantity of work. Mining wages earned per shift worked in the pre-war years directly comparable to those given for July, 1914, and later dates, are not available. If it be assumed that wages per shift moved in strict proportion to the standard rates of hewers, as set out in the table, the standardised average wage per shift in the second half of 1925, as compared with the wages in 1911, 1909–13, and 1914,

respectively, is as follows, in each of the principal districts and in Great Britain as a whole:—

Table 38.

Standardised Average Wages per Shift, July–December, 1925, expressed as percentages of those in July, 1914, 1909–13 and 1911.

District.	Base : July, 1914=100.	Base : Mean of 1909–13 =100.	Base : Mean 1911=100.
Northumberland	160·4	181·2	191·4
Durham	168·8	183·9	189·0
Lancashire, Cheshire and North Staffordshire.	164·8	177·6	181·3
Eastern Division	165·2	178·0	181·7
South Wales and Monmouth..	161·8	169·6	172·1
Scotland	159·6	181·6	191·1
Great Britain (including other districts).	163·9	177·6	182·3

Actually, it is probable that wages per shift worked rose more rapidly than hewers' standard rates from 1909–14, partly owing to the Minimum Wage Act of 1912, and partly through other causes. That is to say, the true percentage increases of wages per shift on 1911 and on 1909–13 are probably greater than is shown in the table.

It is reasonable, however, to use the figures as given, treating any pushing up of wages of the worst paid men by the Minimum Wage Act of 1912 as an-adjustment necessary to bring wages to a fair level for post-war comparisons.

Third, the problem of the miners' cost of living is complicated by special though varying arrangements in respect of coal and housing. Returns obtained by the Commission, the results of which are given in Appendix No. 18 (Table No. 36), show that substantial numbers of miners receive free coal, while the percentage increase in the cost of coal to miners receiving it at special prices is materially less than the increase to the population generally; in so far as a disproportionate amount of the increase in retail prices is due to transport and distribution charges, the same probably holds to a less extent even with miners who buy in the ordinary way. On the other hand, the rents of houses provided by colliery companies appear to have risen proportionately more than rents in general. On balance, in most districts and taking the country as a whole, the two items of coal and rent nearly balance one another; so far as there is any difference it is in favour of the miner, *i.e.*, his cost of living has risen less than that of the general population, but the difference is too small to reckon.

In respect of items other than coal and rent there are also some grounds for supposing that the miners' cost of living may have risen fractionally less than that of the general population.

The foregoing notes deal with the special problems of miners' wages or miners' cost of living. Two further considerations affecting the general cost of living index have now to be noted.

Fourth, the cost of living index is based on the prices ruling in July, 1914; that is to say, a single month. Since the war, the index shows a marked seasonal fluctuation, falling as milk and eggs become plentiful in spring and summer, rising in the autumn; for the three years 1923, 1924, 1925, in which prices have reached a fairly stable post-war level, the cost of living index has averaged 174·7, but the average for the month of July (taken as the mean of the figures for 1st July and 1st August in each year) has been only 171·2, or 3½ points lower. Such evidence as is available for monthly prices before the war suggests that, had the index been calculated in the same way as now, the seasonal movement, though present, would have been less marked; this is in accord with known facts as to changes in the method of fixing of milk prices during and since the war. In the light of the best available information, the following figures may be submitted as an approximate measurement of the movement of the cost of living, corrected for seasonal influences:—

Table 39.

	Base, July 1914.	Base, 1909-13.	Base, 1911.	Base, 1913.
1909-13	99	100	101	97
1911	98	99	100	96
1913	102	103	104	100
July 1914	100	101	102	98
1925 (first half)	174½	176	178	171
1925 (second half)	175	176½	178½	171½

With July, 1914 = 100, the uncorrected index for the second half of 1925 is 175, so that the correction of the base from July, 1914, reduces the index by less than 2 points.

Fifth, the cost of living index, as is clearly stated in the Ministry of Labour's announcement of it, is intended to show the "average increase in the cost of maintaining unchanged the pre-war standard of living of working-class families." An "unchanged standard" means here an unchanged dietary and allocation of expenditure; that is to say, the weights given to the various articles (based originally on working-class budgets collected in 1904, but brought up to date by allowance for certain known changes up to 1914) are retained without change through winter and summer, through war and reconstruction to the present date.

It is difficult to suggest a satisfactory alternative to this procedure, short of collecting a new series of family budgets and estimating their comfort value as compared with pre-war budgets, but the effects upon the index of this unchanged system of weighting have to be noted. One such effect has been mentioned above; people have to be treated as buying exactly as many eggs and as much milk in winter as in summer, in spite of the high prices and the reduced quantities available for purchase; or alternatively the assumption has to be made that what they buy in place of milk and eggs is just as expensive for its comfort value as milk and eggs at winter prices; the resulting seasonal rise in the index does not necessarily represent the facts. Another effect is that the index cannot allow for the inevitable influence of a relative change of prices upon allocation of expenditure. The normal consequence of such a relative change of prices is that people buy more of what has risen less in price, and less of what has risen most in price, in so far as the two articles are in any way alternatives to one another; though there is also the possibility that in certain cases people may be driven by impoverishment to buy more of something which has risen most in price if it still remains the cheapest form of food. For none of these possibilities can an index with fixed weights allow.

The most that can be said is that, though these criticisms are theoretically sound, a theoretically perfect system would not give results differing much in practice from those of the present index.

The broad conclusions from the foregoing analysis are as follows:—

1. If 1914 be taken as basis, the wages of miners to the second half of 1925 have risen appreciably less than their cost of living, though the percentage increments are not in the proportion of 61 to 75 suggested by the crude comparison of earnings per shift and cost of living index. A fairer comparison would be 64 to 75.

2. If 1909–13 be taken as basis, wages and cost of living have moved approximately together, in the country as a whole, but with considerable variation in different districts.

The actual figures for the country as a whole show a rise of 78 per cent. for wages and 76 per cent. for the cost of living. Having regard to the necessarily approximate character of the calculations, no importance can be attached to the difference between these figures. All that can be said is that both wages and cost of living have risen in about the same proportion, and that if there is any difference it is probably in favour of wages having risen slightly more.

In these broad comparisons no account is taken of the third and fifth points mentioned above. Both would probably tend to make the real position of the miner a little better than appears above, and the third would certainly do so in some districts. But neither is at present susceptible of accurate measurement.

8. Notes on Table of Wages in Mining and other Industries.

The material used in preparing the table of wages in Coal Mining and other Industries (Table 15), in Chapter XII of the Report is as follows:—

Coal Mining.

The subsistence wages are those in force in October, 1925, and are based mainly on the evidence submitted to the Commission by Mr. Varley for the Miners' Federation. The lower figure of 41s. 6d. a week represents Northumberland and Durham (7s. 6½d. for 5½ shifts) and the higher figure of 52s. 6d. represents Yorkshire (8s. 9d. for 6 shifts).

The average shift earnings are based on figures supplied by the Mining Association from a wage census taken in September, 1923. Taking all classes of labour and all districts together the average earnings per shift were practically the same in September, 1925. The earnings of the two classes of men shown in the unskilled section (the lowest underground and on the surface respectively) were probably a little higher at the later date, owing to increased subsistence wages under the 1924 agreement. It is not possible, however, to estimate them with accuracy, owing to these subsistence allowances, and the 1923 figures have been retained accordingly in the table. The earnings of the skilled men in the second part of the table, not being affected by these allowances, can be estimated with reasonable accuracy for September, 1925, and this has been done; the earnings are a little lower than those of 1923. The shift earnings shown both for skilled men and others are an average for all districts.

Except for the subsistence wage figure, the number of shifts in a full week is taken as 5½. This is generally the practice in Scotland, Northumberland and most of Durham, where an eleven-day fortnight is usual. In other districts, comprising about two-thirds of the total industry, a six-day week is the rule, though men on afternoon shifts often work only five shifts; in South Wales such men are paid for six shifts, but elsewhere for five only. 5½ shifts a week understates the length of the full week, apart from breakdowns and irregular employment, taking the country as a whole.

The wages and earnings stated exclude the value of free or cheap houses or coal, amounting in Northumberland and Durham to something like 6s. 3d. a week over all adult workmen there, but to much less, or to little or nothing, in some other districts. On the other hand, no deduction has been made in respect of charges for tools and damage to clothing (for which rebates in respect of Income Tax ranging from 1s. 4d. to 4s. 8d. a week are allowed in some districts by the Income Tax authorities), nor in respect of explosives, applying mainly to the hewers and repairers (for which no estimate can be given).

The weekly hours given in the table are for 5½ shifts of full length. In many districts working time on Saturday is usually an hour or more shorter than on other days. The following statement shows the customary working time per week in the different districts.

Table 40.

District.	Days per fortnight.
Scotland	1 idle day and 11 full days, except in a few cases in Lanarkshire, where the collieries work 10 days and have 2 idle days.
Northumberland ..	1 idle day with 1 short and 10 full days, or, less often, 11 full days.
Cumberland	2 short and 10 full days.
Durham	1 idle day, 11 full days.
Yorkshire	2 short and 10 full days, and in some cases 12 full days.
Lancashire	2 short and 10 full days.
North Wales	No short or idle days observed except in a few cases.
Midland	2 short and 10 full days.
Stafford	2 short and 10 full days.
Cardiff	} 12 full days.
Swansea	
Monmouthshire ..	
Forest of Dean ..	2 short and 10 full days.
Bristol and Somerset ..	2 short and 10 full days.

The number of hours per day underground is taken as 8½ in 1914 and 7½ in 1925. On the surface the normal weekly hours were 54 in 1914 and now are 46½, exclusive of meal times. Some classes of surface workers, including pit-head and screen men, are at some collieries not required to attend beyond the period of coal-winding, and may in practice have a rather shorter week than the normal.

Other Industries.

Iron and Steel, Cotton and Wool.—Wage rates comparable to those used for other industries cannot be given for *Iron and Steel Manufacture (skilled men), Cotton and Wool*. The percentage increases, computed from general district increases since July, 1914, are as follows :—

Iron and Steel :

Labourers and semi-skilled men : From 22½ per cent. in some districts to 70 in others.

Skilled men : From 22½ per cent. or less in some cases to over 60 in others.

Cotton (Lancashire) :

The general increase in district piece-work price lists, reduced to make allowance for the shorter working week, is from 65 to 70 per cent. In some cases the actual increase is greater.

Wool (Yorkshire) :

From 80 to 90 per cent. or over in some cases.

It is possible that the percentages computed by this method may not fully represent the percentage increases in actual wages, since alterations may have been made, in some cases, in the basis rates to which the percentages are applied, as to which information is not available. For example, in the case of one class of worker (Willeyers and Fettleys) in some of the principal districts in the Yorkshire Woollen Industry for which some comparable information is available for 1909-13 and 1925, the wage rates at the two dates would appear, from such information as is in the possession of the Ministry of Labour, to have been 54s. 10d. in 1925, compared with 25s. 5d. to 27s. 9d. in 1909-13, showing increases varying from about 98 to 116 per cent.; whereas the general percentages of increase shown in the table for the Yorkshire Woollen Industry between 1914 and 1925 are 80 to 90 per cent.

Exact figures are not available as to the weekly hours in *Iron and Steel Manufacture* in 1914. In some cases 8-hour shifts were worked and in others 12-hour shifts. At blast furnaces, an average of 7 shifts of 12 hours, or 7 shifts of 8 hours usually constituted a full week. At steel works, rolling mills, etc., an average of 5½ shifts of 12 hours, or of 5½ shifts of 8 hours usually constituted a full week, but in many cases the Saturday shift was shorter than the other shifts. Day workers generally had a week of about 53 or 54 hours. In 1925 the shift was generally 8 hours. The hours quoted for September, 1925, are inclusive of meal times, when taken.

Ironstone Mining.—The hours include intervals for meals, where taken.

Agriculture.—The wages include allowances in kind. Figures as to hours are not available for 1914, but the hours were generally longer than in 1925.

Railway Service.—The wages are taken from the statement submitted by the Railway Companies to the National Wages Board in November, 1925.

In 1914 the hours of labour varied, and statistics are not available as to the extent of the variation or as to the average hours worked. In 1907 the normal weekly hours averaged over 60 for porters, about 58 for engine cleaners, about 62 for engine drivers, about 61 for guards, and about 57 for signalmen.

Dock Labour.—The hours of labour in 1914 were ten per day, and in September, 1925, eight.

For the following industries the rates of wages quoted are the unweighted averages of the recognised district rates of wages for the various occupations in varying numbers of the larger towns or principal districts. For *Electricity Supply* the particulars relate to 50 large towns; in the case of *Building, Tramways* and *Gas Works*, to 40 large towns; *Local Authorities* (non-trading services), 28 large towns; *Printing* and *Baking*, 26 large towns; and *Road Transport*, 12 large towns. In the case of *Engineering* 16 districts are represented, and in *Shipbuilding*, 9 districts.

If a larger number of districts were included in the computations, or if the wage rates for different districts had been "weighted" in accordance with the number of workpeople employed in each town or district, the average wages and the percentages of increase might differ to some extent from those quoted.

As the towns or districts covered vary in different industries the average rates shown are not strictly comparable.

The figures given, moreover, relate to *time* rates of wages: it is possible that in the *Engineering* and *Shipbuilding* industries the percentage increases in the wages of piece workers may be materially different from those shown for time workers.

9. The Present Position and Prospects.

The Mining Association, in their second memorandum,* submitted a table comparing in each district the prospective proceeds and costs of production per ton commercially disposable on two assumptions. The first assumption was that the costs would be those of October, 1925; the second, that the average price obtainable per ton would be 40 per cent. above the mean of the five years, 1909–13. The result was to show costs per ton exceeding proceeds by amounts ranging from 3s. in Northumberland to 7s. 5d. in Lancashire, Cheshire and North Staffordshire. The average for the whole country was not given by the Association, but works out at just over 4s. The table then set out how the varying gaps in each district might theoretically be bridged by increase of working hours, by reduction of miners' wages, and by reduction of other costs.

About the first assumption in the table, as to costs of production, there is little to say. There is nothing exceptional in the costs for October; they differ only by a few pence from the costs for the whole of the last quarter of 1925, which being now available are used in the following discussion.

Everything turns on the second assumption, as to prospective prices. On this, the argument of the Association is set out in the following explanatory note appended to their table:—

“(1) The estimate of the general level of possible future coal prices must in the nature of things be speculative. In framing the estimate in this table the Association have had in mind that the price obtainable for British coal, whether for export or for inland consumption, is ultimately determined by world conditions, and they have had regard particularly to the following considerations:—

(a) The level of prices obtaining in the principal coal exporting districts in October, 1925. Although the average realised price for the total sales in these districts in October, 1925, was 30 per cent. over 1913, current f.o.b. quotations for coal for export approximated to those of 1913. In consequence of price reductions demand then showed signs of recovery, and the annual rate of export is now about 52 million tons as against a rate of about 45 million tons in the summer.

(b) The index number of iron and steel prices. The general level of these prices is about 20 per cent. over 1913. This trade is the largest industrial consumer of coal in the country and accounts for 20 per cent. of the total inland consumption.

* Evan Williams, Table I.

- (2) Though the percentage increase in realised coal prices is greater in inland than in exporting districts, experience proves that, in the long run, these differences will be largely eliminated. The level of iron and steel prices, determined by world conditions, reinforces the tendency toward the approximation of inland and export coal prices which follows from the fact that many important classes of coal are in demand alike for use in this country and for export.
- (3) Having regard to these and other considerations, the estimate in the table is based on a level of prices 20 per cent. above 1913, or 40 per cent. above the five years 1909-13."

It was recognised by the Association, in the first of the foregoing notes, that the average price thus assumed by them of 40 per cent. above 1909-13, was below the actual proceeds at the time that the table was prepared. In the last quarter of 1925 the average value at the pithead per ton commercially disposable has, in fact, been 15·98s. as against 9·58s. in 1909-13, an increase of 67 per cent. In the same quarter the declared f.o.b. value of exports per ton has been 18·40s. as against 12·16s. in 1909-13, an increase of 51 per cent.

It was urged by the Mining Association, however, in evidence that pithead and export values gave an unduly favourable view of the prospects, because there still entered into them a substantial proportion of prices under long-standing contracts made during the early part of 1925. The current quotations were much lower and, as the old contracts ran out, the pithead and export values would tend to fall rather than to rise.

The following table gives the market quotations (f.o.b.) for six well-known classes of coal in 1909-13, 1913, at the end of December, 1925, and at the beginning of February, 1926.

Table 41.

Class of Coal.	Market Quotations (f.o.b.) in Shillings.				Increase per cent. over Mean of 1909-13.	
	Mean of 1909-13	1913.	24th Dec. 1925.	4th Feb. 1926.	24th Dec. 1925.	4th Feb. 1926.
Scotch navigation screened.	14·71	16·83	18·00	21·50	22	46
Admiralty seconds	16·87	19·21	22·25	22·13	32	31
Rhondda large ..	17·46	17·46	26·50	26·75	52	53
D.C.B.'s	12·50	15·29	15·38	17·00	23	36
Best Durham gas ..	12·87	15·83	17·25	19·75	34	53
Durham unscreened bunkers.	11·83	14·87	17·00	18·00	44	52

It will be seen that the statement of the Mining Association (made at the beginning of 1926) that current f.o.b. quotations were approximating to those of 1913 is justified for certain classes of coal. If the comparison is made, as it should be made, with 1909-13, the percentage increases at the end of 1925 for the six classes of coal range from 22 to 52, with an arithmetic average of 35. Prices were at that time already rising, and have since risen further. At the beginning of February, 1926, the percentage increases ranged from 31 to 53, with an arithmetic mean of 45. This rise of current quotations during January appears just about to have compensated for loss through running out of old contracts in December. The average declared value of exports in January was 18s. 5d. as compared with 18s. 6d. in December.

Export prices in February, therefore, approximate to, while exceeding slightly, the 40 per cent. increase over 1909-13 suggested by the Association. It is not justifiable, however, to take the increase of current export quotations in 1925 over 1909-13 as typical for the whole coal trade; the latter part of the period 1909-13 was one of exceptional activity and high prices in the export trade, while the present time is one of exceptional depression as compared in each case with the coal trade as a whole. The gap between present and pre-war prices in exports is thus unduly reduced, at both ends, for exports as compared with the trade as a whole. The quotations for inland sale show a materially greater rise over 1909-13. Thus the f.o.b. price of typical gas coal shipped from the north-east coast ports to London was 10s. 11d. for 1913 and 20s. 9d. for 1925-26, an increase of 90 per cent. Locomotive coal bought by railway companies shows an increase over 1909-13 of 107 per cent in the first 10 months of 1925 and 60 per cent. under contracts made at the end of 1925 and early part of 1926. Industrial coal generally at the end of 1925 ranged from 55 per cent. to 90 per cent. above the 1909-13 level, while house coal was up about 100 per cent. It is no doubt probable, as stated by the Mining Association, that this difference between inland and export prices will in time disappear; but it is more likely to do so through an increase of export prices than through the decline of inland prices. There is ground for believing that Germany, our principal exporting rival, cannot sell profitably at the prices now ruling, so that sooner or later the export price may be expected to rise still further, and combination amongst the British exporters may help it to do so.

If any general percentage over 1909-13 be taken as a guide to future prospects, something materially higher than that chosen by the Mining Association—say 60 or 70 per cent.—would be a more defensible figure. For many reasons, however, it is better to take the actual proceeds, district by district, in a given recent period, than to add some uniform arbitrary percentage to the proceeds of a pre-war period. The latter procedure is unsatisfactory, because it ignores the different fortunes of different districts. The average increase of proceeds in the last quarter

of 1925 over the mean of 1909–13 is 67 per cent. over the country as a whole, but this average is seriously untrue of nearly every separate district; the increases in the nine principal districts range from 42 in Northumberland to more than 100 both in Lancashire, Cheshire and North Staffs, and in Leicester, Cannock Chase and Warwick. Generally speaking, the exporting districts, which were particularly prosperous just before the war and are particularly depressed now, show small percentage increases, while, conversely, the inland sale districts, like Lancashire, West Yorkshire, and the Midlands, show large percentage increases. The danger of applying a uniform percentage increase to each district is well illustrated by the case of Lancashire. In the theoretical table put forward by the Mining Association, of all the important districts, Lancashire shows the greatest deficiency of proceeds against costs, namely 7s. 5d. If we assumed instead of 40 per cent. a uniform increase of 67 per cent. in each district, corresponding to the actual average of the whole country, Lancashire would still theoretically be last with a deficiency of 4s. 6d. Its actual deficiency, owing to the greater rise of its prices, is about 1s., which makes it much better off than any important district, except those forming the Eastern Division.

This point illustrates clearly the harmfulness of fixing minimum wages by a uniform percentage on a single pre-war year (like 1914), and thus endeavouring to stereotype for all time the purely temporary conditions of that year. This is particularly harmful when, as at present, the minimum wage practically supersedes any economic wage which would allow for the economic conditions of each district at the time.

On the whole there are good reasons for taking as typical the actual proceeds and costs of the last quarter of 1925. In some respects the proceeds of that quarter should be improved on; current export prices have risen, and all prices were depressed by the subsidy; the results for the last month (December) were better than those for the whole quarter. In other respects the proceeds of that quarter are unduly favourable: they are buoyed up by old contracts, while inland prices are raised by the winter season; both export and inland prices may probably already have been showing the effects of an abnormal demand to obtain stocks of coal before May 1st; certain parts of the trade also have benefited by the dispute in the American anthracite industry.

The average increase in the whole country of 67 per cent. over the 1909–13 pithead values is not very far from the increase of commodity prices generally. For the year 1925 the Statist index of wholesale prices shows a rise of 69 per cent. above the level of 1909–13; for the last quarter of 1925 the percentage is 63. Up to the war, coal prices over a long period had risen more rapidly than general prices, thus compensating in this country for diminished production per head. For reasons given in the Report there is little ground for expecting that this tendency will reappear in the near future. The world famine of coal in and just after the war has stimulated the opening of new coalfields, the use

of alternative forms of power (lignite, oil and water), and the more economical utilisation of coal. The last of these changes, by increasing general prosperity and production, may ultimately lead to a demand for more and yet more power from coal and so raise prices. But this will take time; the first effect of successful saving in the use of coal must be a tendency to bring down the price that it can command.

In the immediate past, till late in 1924, the British coal industry has been sustained by a series of, for it, happy accidents—destruction of French mines, occupation of German mines, disputes in American mines; 1925 is probably more nearly typical than any other year since the war. In the immediate future it is difficult to see any outside force that is likely to lift coal prices materially above their present level. They may so rise, but it is unsafe to count on this. The minimum wage cannot safely be fixed with reference to anything more.

In the following calculation accordingly, the actual proceeds and the actual cost of production in the last quarter of 1925 are taken as the basis from which to judge future prospects.

The accompanying table shows, in its first five columns, the actual working results in each district and in Great Britain as a whole in that quarter. The large Eastern Division is here shown both as a whole and split into four main sections; this is interesting statistically, but must not be taken to imply any view as to how the country should in future be divided for ascertainment of wages.

Table 42.
COSTS AND PROCEEDS.
Quarter ended December, 1925.

(All figures represent shillings and decimals thereof.)

	Wages Costs.	Other Costs.	Total Costs.	Proceeds (without Sub- vention).	Actual Profit or Loss (4)-(3).	10 % of Wages Cost as in col. (1).	Profit or Loss with Wages reduced 10 %.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Per ton commercially disposable.							
Scotland ..	11.60	4.64	16.24	14.40	-1.84	1.16	-.68
Northumberland..	10.98	4.99	15.97	12.98	-2.99	1.10	-1.89
Durham ..	11.54	5.56	17.10	14.16	-2.94	1.15	-1.79
South Wales and Monmouth.	14.43	6.28	20.71	17.51	-3.20	1.44	-1.76
South Yorkshire	11.58	4.08	15.66	15.32	-.34	1.16	+.82
West Yorkshire..	12.33	4.68	17.01	17.25	+.24	1.23	+1.47
Notts and Derby	11.51	4.11	15.62	15.60	-.02	1.15	+1.13
Leicester, Cannock Chase and War- wick.	11.72	4.27	15.99	17.11	+1.12	1.17	+2.29
Eastern Division	11.65	4.11	15.76	15.97	+.21	1.17	+1.33
Lancashire, Che- shire and North Staffs.	14.99	5.36	20.35	19.41	-.94	1.50	+.56
Other Districts ..	13.86	5.31	19.17	16.72	-2.45	1.39	-1.06
GREAT BRITAIN..	12.48	4.97	17.45	15.98	-1.47	1.25	-.22

The actual results are a loss in each of the nine principal districts shown in the table except West Yorkshire and Leicester, Cannock Chase and Warwick, both included in the Eastern Division. The loss is about 3s. in each of the main exporting districts. For the whole country it averages just under 1s. 6d., which is 1s. 3d. worse than in the first half of 1925. It may be added that a special return from the Joint Accountants under the wage agreement shows that, in the last quarter of 1925, 73 per cent. of all coal raised in Great Britain was raised at a loss, *i.e.*, at costs exceeding the proceeds apart from subvention.

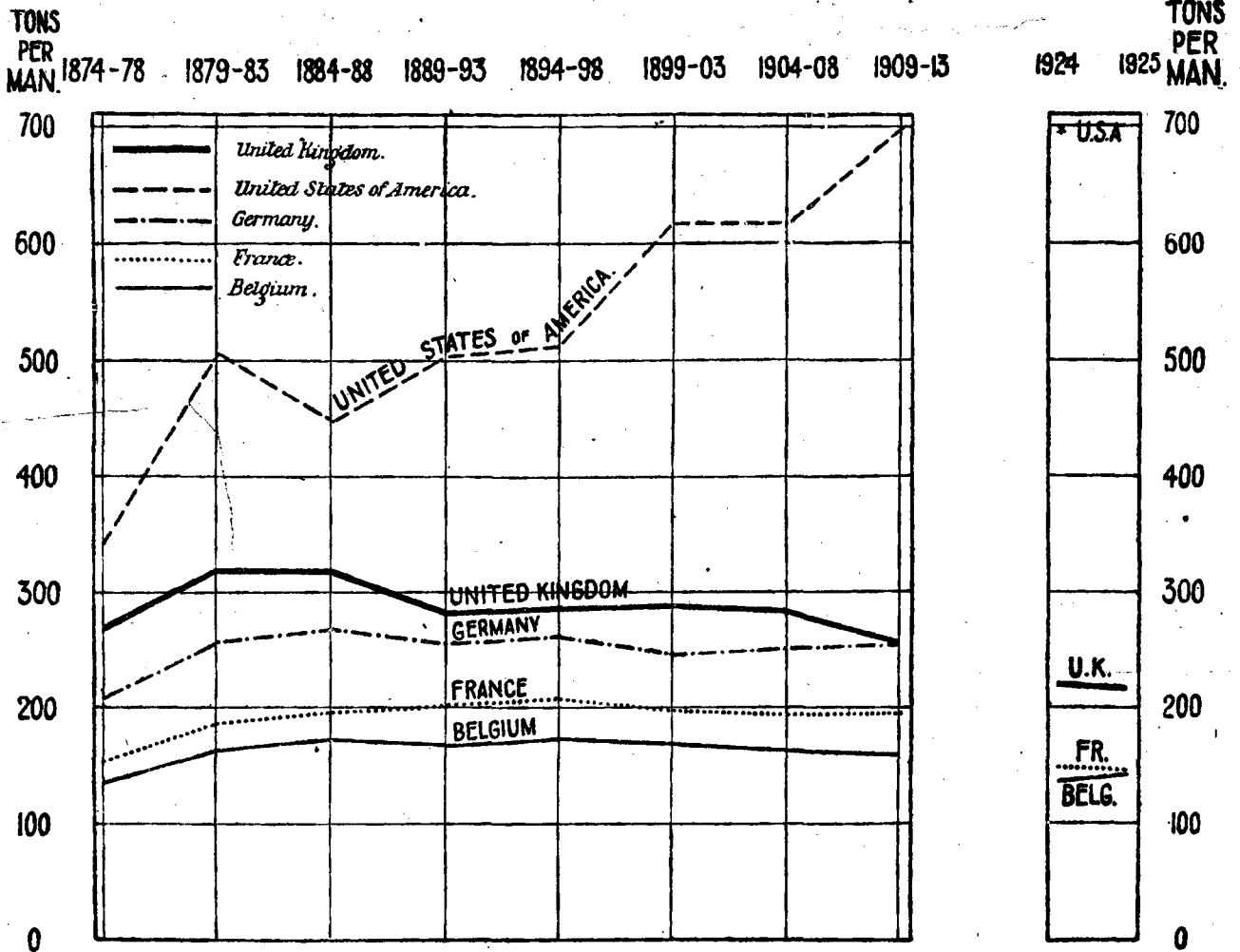
The average loss of nearly 1s. 6d. per ton over the country as a whole represents a little more than 10 per cent. of the wages cost; the latter, as shown at the foot of column 6, is 1s. 3d. a ton. A reduction of wages by 10 per cent., *i.e.*, a return to the minimum percentage ruling till April, 1924, under the 1921 agreement, would therefore nearly, though not quite, bring about a balance of costs and proceeds; a very small rise of prices would wipe out the remaining adverse balance of 3d.; more than half the total output of coal in the country would still be raised at a loss.

Such a return to the 1921 minimum would leave the separate districts on the October–December, 1925, prices, in the positions shown in column 7, with losses between 1s. 9d. and 2s. in the three main exporting districts, and a profit of 1s. 4d. in the Eastern Division. It may reasonably be hoped that rising export prices will make the actual position in the exporting districts in May somewhat better than is shown in the table, while there is a possibility that decline of winter demand may make the actual position in the Eastern Division rather worse than is shown.

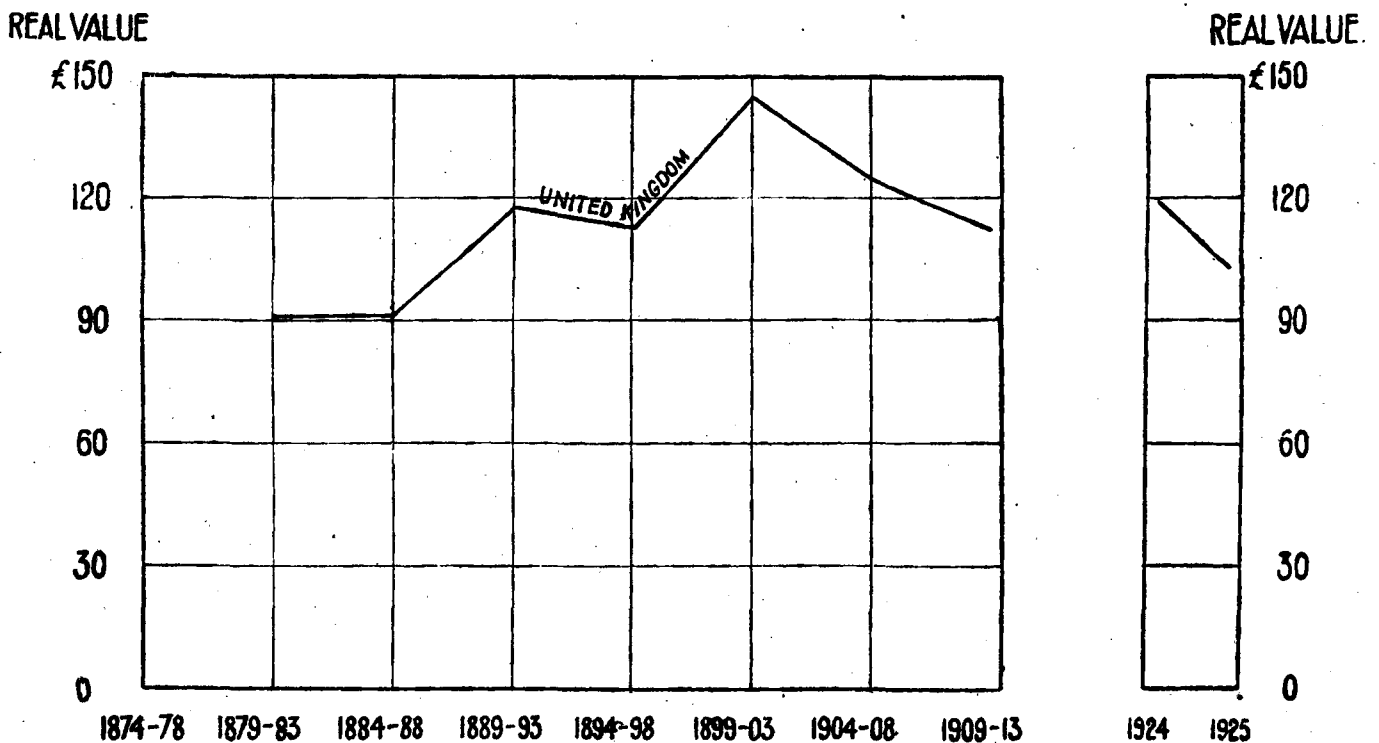
The main result of the table, however, is to show the unsuitability of any simple procedure like a return to the 1921 minimum, or any other minimum fixed by uniform percentage on the year 1914. Greater reductions are almost certainly needed to give any chance of equilibrium in the exporting districts, and smaller ones would still leave a profit elsewhere.

It may be added that the provisional working results for January, 1926, confirm the general conclusion above as to the improbability of any early large improvement from the conditions of October–December, 1925. The gross proceeds per ton for the whole country are a fraction of a penny higher than those for the quarter, but lower than those for December alone. The gross proceeds in the exporting districts are a trifle lower than those for December, rising prices as stated above just failing to compensate for the expiry of old contracts. The loss in the country as a whole is a few pence less per ton than in the whole last quarter of 1925, but a fraction of a penny more than in December. Generally the improvement of results (*i.e.*, decline of losses per ton) which had taken place month by month from August to December appears to have been arrested.

YEARLY OUTPUT OF COAL PER MINER.



REAL VALUE OF THE BRITISH MINER'S YEARLY OUTPUT BASED UPON PRICES* IN 1909-13.



* The "Statist" Index Number has been used in the conversion of actual values to real values.