

CONTENTS

- 1) An Industrial Survey of Merseyside
made for the Board of Trade by the
University of Liverpool.
X9.316.N3E4 G2
- 2) An Industrial Survey of the North
East Coast Area. made for the
Board of Trade by Armstrong College,
Newcastle-upon-Tyne.
X9.317.N3E4 G2

BOARD OF TRADE
AN
INDUSTRIAL SURVEY
OF
MERSEYSIDE

MADE FOR THE BOARD OF TRADE
BY THE
UNIVERSITY OF LIVERPOOL

Crown Copyright Reserved

X9.316.1344

92
10823



LONDON
PRINTED AND PUBLISHED BY HIS MAJESTY'S STATIONERY OFFICE
To be purchased directly from H.M. STATIONERY OFFICE at the following addresses
Adastral House, Kingsway, London, W.C.2; 120, George Street, Edinburgh
York Street, Manchester; 1, St. Andrew's Crescent, Cardiff
15, Donegall Square West, Belfast
or through any Bookseller

1932

Price 2s. 6d. Net

AN INDUSTRIAL SURVEY OF MERSEYSIDE.

TABLE OF CONTENTS.

	PAGE
INTRODUCTION.—Letter to the President of the Board of Trade ...	5
Preface	6
PART I.	
SECTION I. i.—Definition of the Area Surveyed	7
ii.—General description of the Area	7
iii.—Population	10
iv.—Financial Position	11
Footnotes to Section I	11
SECTION II. i.—Industrial Character of the Area	12
ii.—Unemployment in different Industries	14
Footnotes to Section II	16
SECTION III. i.—Characteristics of Liverpool as a Port	16
ii.—Imports and Exports	17
iii.—Direction of Sea Trade	19
iv.—Main Features Summarized	19
Footnote to Section III	19
SECTION IV. —CONCLUSIONS RELATING TO INDUSTRIES.	
A. Shipping and Associated Industries.	
i.—The Present Employment Position	20
ii.—Causes of Depression	21
iii.—Imports and Exports	21
iv.—Prospects of Trade Recovery	22
v.—Absorption of Labour Surplus	22
B. Distributive Services.	
i.—The Present Employment Position	23
ii.—The Causes	24
iii.—The Prospect of Recovery	24
C. Building and Associated Industries.	
i.—The Present Employment Position	25
ii.—The Causes	25
iii.—The Immediate Future	26
iv.—The More Distant Future	26
D. Manufacturing and Production.	
<i>Metals and Engineering.</i>	
i.—The Present Employment Position	27
ii.—Causes and Prospects	27
<i>Food and Drink.</i>	
i.—The Present Employment Position	27
ii.—Causes and Prospects	28
<i>Clothing and Textiles.</i>	
i.—The Present Employment Position	28
ii.—Causes and Prospects	28
<i>Printing, Stationery and Paper.</i>	
i.—The Present Employment Position	29
ii.—Causes and Prospects	29
Conclusion—Relating to Manufacture	29
General Service.	
Footnote to Section IV	30

	PAGE
SECTION V.—GENERAL CONCLUSIONS.	
i.—Employment Capacity	30
ii.—The Order of Initial Recovery among Merseyside Industries	31
iii.—Industries which may Absorb the Unemployed of Others	34
iv.—New Industries	35
v.—The Forces of Expansion	36
vi.—Surplus of Labour on Merseyside	36
vii.—New Entrants into Industry	38
viii.—Further Enquiries	39
ix.—Prospective Action	39
x.—Tariffs	40
xi.—The Balance of Trade	42
xii.—Monetary Policy	42
Footnotes to Section V	44
PART II.	
SECTION I. Method of Enquiry	44
SECTION II.	
i.—General Review of Employment on Merseyside	45
ii.—Trend of Employment in Various Industries	46
iii.—Comparison between Developing and Declining Industries	48
iv.—Movement of Labour between Industries	51
v.—Displacement of One Type of Labour by Another	52
Footnotes to Section II	53
SECTION III.—DETAILED STUDY OF INDUSTRIAL GROUPS.	
A. Shipping and Associated Industries.	
i.—Employment	55
ii.—Trends in Merseyside Sea Trade	58
iii.—Imports and Exports	61
iv.—Imports—Trade in Particular Commodities	62
v.—Exports—Trade in Particular Commodities	67
vi.—The Passenger Trade	75
vii.—The Regional Aspect	78
viii.—Summary of Factors Affecting the Shipping Industry	80
<i>Shipbuilding and Repairing.</i>	87
<i>Casual Labour at the Docks.</i>	87
B. Distribution, Transport and General Services.	
<i>Distribution—</i>	
i.—Employment	91
ii.—Prices and Markets	93
iii.—Rings and "Cutting"	94
iv.—The Supply of Labour	95
v.—Rationalisation	95
vi.—Rents, Rates and Taxes	95
vii.—Hire Purchase System	96
viii.—Coupon Selling	96
ix.—Manufacture on Merseyside	96
<i>Transport—</i>	
i.—Employment	97
ii.—The Railway System	97
iii.—Railway Traffic	98
iv.—The Road System	103
v.—Road Traffic	104
vi.—The Competition between Rail and Road Transport	109
vii.—Canals	112
<i>General, Government and Public Utility Services—</i>	
i.—General Services	113
ii.—Government Service, Central and Local	115
iii.—Public Utility Services	116

PART II—continued.

PAGE

SECTION III—continued.

C. Building and Associated Industries.

i.—Employment	118
ii.—The Aim of the Enquiry	118
iii.—The Recent Fall in Building Costs	120
iv.—Causes of the Fall in Building Costs	121
v.—Cost of Building Materials	122
vi.—The Cost of Labour	123
vii.—Overhead Charges and Profit	124
viii.—Increase in the Size of Building Firms	124
ix.—The Amalgamation of the Various Trades	125
x.—Replacement of Labour by Machinery	126
xi.—Transport Costs	127
xii.—Interest Costs	127
xiii.—Long Period Interest Rates and Rents	128
xiv.—Number of Houses Built since 1924	129
xv.—Future Construction	130

D. Manufacturing Industries.

Metal Industries and Engineering—

i.—General Position	134
ii.—Miscellaneous Metals	135
iii.—Constructional and General Engineering	136
iv.—Electrical Industries	137
v.—Construction and Repair of Motors, etc.	138

Food, Drink and Tobacco—

i.—General Position	141
ii.—Baking and Biscuit Making	141
iii.—Sugar and Confectionery	141
iv.—Milling	142
v.—Cattle Food and Oilcake	142
vi.—Drink and Tobacco	142
vii.—Movement of Labour	143
viii.—Rationalisation	143
ix.—The Future	144

Clothing Industries—

i.—General Position	147
ii.—Clothing	147
iii.—Textiles (excluding silk)	147
iv.—Leather Goods	148
v.—Artificial Silk	148

Miscellaneous Manufactures—

i.—General Position	151
ii.—Oils, Soap, and Paint	151
iii.—Chemicals and Rubber	152
iv.—Printing, Stationery and Paper	153
Footnotes to Section III	156

SECTION IV. i.—The Field for Expansion	157
ii.—New Industries	158
Footnote to Section IV	160

SECTION V.—SURPLUS OF LABOUR.

i.—“Normal” Unemployment	161
ii.—Unemployment since 1929	161
iii.—New Entrants into Industry	161
Footnotes to Section V	161

SECTION VI.—SUPPLEMENTARY REPORT RELATING TO MERSEYSIDE “B” AREAS.	161
--	-----

University of Liverpool,
19, Abercromby Square,
Liverpool.

December 31st, 1931.

*To the Rt. Hon. Walter Runciman, M.P.
President of the Board of Trade.*

SIR,

By a letter from the Board of Trade dated the 25th March, 1931, the University of Liverpool was invited to conduct an industrial survey of the Merseyside area. At the same time, it was intimated that our enquiries should be directed towards the production of a report which should include :—

- (a) a survey of the present industrial position of the area ;
- (b) the prospects of early expansion and new development, having regard particularly to new industrial developments within recent years, and
- (c) so far as practicable, an assessment of the prospective employment capacity of the various industries in the area as a basis for an estimate of the volume of labour likely to be surplus to the requirements of individual industries within the next few years.

We now have the honour to submit the accompanying Report on the above matters.

We have the honour to be,

Sir,

Your obedient Servants,

D. CARADOG JONES,

Director of Survey.

J. R. BELLERBY,

Professor of Economics.

University of Liverpool.

PREFACE.

The Report has been divided into two parts. Part I defines the boundaries and describes the character of the area surveyed. The main results of the Survey are then summarised. Part II contains the material upon which the conclusions in Part I are based. The method of enquiry is explained and a detailed study follows of industries which are of some importance on Merseyside. Special attention is devoted to the subject of employment with a view to estimating the surplus of labour in the area.

In presenting our Report we desire to acknowledge the courtesy of Central and Local Government Departments, official bodies and private individuals, who have put at our disposal information relevant to our enquiries. Valuable assistance has been given in collecting or analysing material by Mr. H. J. H. Parker, Mr. C. T. Saunders, Mr. E. O. Humphreys, and Mr. G. Tatham. We are particularly grateful to Mr. David Rodgers, who has been almost entirely responsible for the section on Shipping, and to Miss D. E. Coleman, who as Secretary has given ungrudging service throughout.

In a period of rapidly changing influences it is important to bear in mind that the conclusions reached by the authors, and submitted with all diffidence, relate to the conditions ruling at the end of the year 1931.

INDUSTRIAL SURVEY OF MERSEYSIDE.

PART I.

§ I.

(i) Definition of the Area Surveyed.

Merseyside, as defined for the purpose of this Survey, includes the following areas :—

	A.	B.*
Lancashire	Liverpool C.B.	Barrow-in-Furness C.B.
	Bootle C.B.	Southport C.B.
	Waterloo and Seaforth U.D.	Ormskirk U.D.
	Litherland U.D.	Formby U.D.
	Great Crosby U.D.	Huyton and Roby U.D.
	Little Crosby U.D.	
Cheshire	Wallasey C.B.	Ellesmere Port U.D.
	Birkenhead C.B.	
	Bebington and Bromborough U.D.	

The accompanying map shows how these districts are situated and a brief description of the character of the area follows :—

(ii) General Description of the Area.

The area described as Merseyside is spread out along both shores of the Mersey Estuary : its constituent districts, though geographically divided by the water, are socially and economically knit closely together. On the Lancashire side is Liverpool, which alone accounts for the bulk of the matter in this Survey. To the north are Bootle and Litherland, little more than extensions of Liverpool. These areas together constitute a great semi-circle, some six miles in radius, and almost the whole of the diameter—the eastern coastline of the Mersey—has been moulded into docks. At the narrowest point of the Mersey Channel, where the final constriction occurs before it widens out to the sea, is situated the geographical and commercial centre of Liverpool. Here, the river is crossed by ferries—transporting goods and passengers—and tunnelled by

* Note.—To avoid interrupting the argument in the text explanatory notes, such as the one referred to here (see p. 11), and particularly those of a statistical character relating to methods adopted to obtain results rather than to the actual material, have been relegated to the end of each section. It is important that readers who may wish to pursue the examination of the figures further than this should consult the original sources from which they were taken, as it has been impossible in this Report always to draw attention to qualifications to which some of them may have been subject.

MAP OF MERSEYSIDE.



*Areas included under A are shown inside dotted lines;
those areas included under B are not inside dotted lines.*

the old railway and by the new (yet unopened) road tunnel. All along the line of docks, but especially at this central point, are concentrated the greater part of Liverpool's commercial and industrial activities, with its warehouses, factories and offices. Indeed, apart from railway shunting yards and from a number of isolated factories, hardly any large part of Liverpool away from the riverside can be described as industrial. But the town-planning schemes of the Corporation allow for the development of new industrial areas in Walton, Fazakerley and Aintree, and alongside the great East Lancashire Road, not yet completed, which is to run out to Manchester and Yorkshire through the north of the city. Further along the coast, north of Bootle, straggle Waterloo and Seaforth, Great Crosby and Little Crosby, districts which are mainly residential and unimportant industrially.

The main part of the Cheshire side of the Mersey which is included in this Survey is about 9 miles long and is divided into three very different sections. Starting from the north, Wallasey comes first, then Birkenhead, and, to the south, Bebington-Bromborough. Of these, Birkenhead is the largest and most important section and it resembles Liverpool the most closely. Birkenhead and Wallasey are separated by the long inlet of Wallasey Pool, whose advantages as a site for docks have been well utilised. This inlet and the Birkenhead shore just south of the Pool's mouth have, like the Liverpool coastline, been moulded into docks. Behind the docks, and chiefly in Birkenhead, are warehouses and a certain number of factories. The great shipbuilding yards of Cammell Laird are, however, the site of Birkenhead's chief industry. Bebington-Bromborough, with its soap and candle works and Lever's world-famous Port Sunlight factory, constitutes the second industrial centre on the Cheshire side. Here a large private dock has been recently opened and attractive sites are available for new factories. Apart from these two important industrial areas on the west coast of the Mersey, the greater part of the Bebington-Bromborough district, nearly all of Wallasey and much of Birkenhead serve chiefly as dormitories for people who cross the river every day to work in Liverpool.

In addition to the closely connected and compact districts already described—districts which for most purposes compose a single economic unit—a number of neighbouring areas have been included in the Survey. Formby and Southport are on the coast some way to the north of Liverpool; Ormskirk, which is now one with Lathom and Burscough, is an area some 8 or 9 miles from the borders of the city, to the north-east; Huyton and Roby make up an Urban District adjoining it on the east. All these areas are socially and industrially subsidiary to Liverpool and provide homes for many people working in the city. Ellesmere Port, on the Cheshire side 3 or 4 miles south of Bebington-Bromborough, is a specialised port on the Manchester Ship Canal, almost independent of Liverpool.

Its activities as a port are necessarily a dominating factor in any consideration of Merseyside's economic structure. On account of the decline in Britain's exports, efforts are being made to increase the number of factories in the neighbourhood engaged in direct production ; but the chief industry on Merseyside remains the work of loading and unloading of ships, and of receiving and distributing by rail and by road the imports and exports of Great Britain. Liverpool is still the greatest port in the country after London and one of the greatest in the world. Now the economic position of a great port naturally depends on the activities of its hinterland. Liverpool's hinterland is the heart of industrial Britain and Liverpool's prosperity depends on that of Lancashire, Yorkshire and the Midlands. Their merchants buy raw materials and food which pass through the port and they send from it their exported manufactures.

In distance Liverpool is a near neighbour to the great northern centres of British industry and trade. The journey by rail to Manchester takes barely 45 minutes ; the two cities are connected also by road and canal, and when the East Lancashire Road is completed they will be brought still closer together. Proximity to Manchester is of the greatest importance to Liverpool, since cotton accounts for nearly one-third of Liverpool's trade. With the integration of business and the growing need for business men to visit their markets in person, the distance from London is another factor of importance. London is less than 200 miles away, a 3½ hour train journey ; indeed it has been significantly said that many of Liverpool's business men spend a third of their working time in the London express.

But Merseyside as a port does not look only to the east. On the west is all North Wales, for which, also, Merseyside, and particularly Birkenhead, acts as a distributing centre. Unfortunately the straight line from the port to North Wales is interrupted by the Dee Estuary, though some day that may be bridged. At present it is necessary to circumvent it by way of Queensferry. Three railway companies cater for Merseyside traffic. The L.M.S. and the Cheshire Lines, which cover much of industrial Lancashire, have termini in Liverpool while the Great Western Railway runs into Birkenhead.

(iii) Population.

Within the last century the population of the Merseyside area has grown at a great rate. There was a time when, after London and Bristol, Chester was the third port in the kingdom and the reputation of Liverpool had still to be made. At the last Census the population of Liverpool was 856,000, more than four times the number recorded in 1831. Part of this development has been due to a persistent extension of boundary. As the urban population encroaches on adjacent rural areas, those areas are brought within the jurisdiction of the city. Another important factor is the continual redistribution of the population within the area : as the city

fills up, people move out to places near by. Liverpool has been losing heavily from this form of "emigration" for fifty years, while Bootle, Birkenhead and Wallasey have until recently gained. In the last ten years, however, all four county boroughs have lost on balance, for the "emigrants" now look further afield; for example, the population of Southport has increased from 41,000 to 79,000 since 1881. Significant of this trend is the fact that over the last fifty years the rate of increase of Liverpool's population has been definitely declining and throughout the century it has been exceeded by the rate of increase of the population of Merseyside taken as a whole.

(iv) Financial Position.

The rateable value of the four County Boroughs which constitute the greater part of industrial Merseyside was, in 1930-31, £8,600,000,† of which Liverpool alone accounted for £6,400,000§ or £7 11s. 0d. per head. It would be tedious to rehearse figures in detail for each County Borough. It will suffice perhaps to quote a few for Liverpool to illustrate the magnitude of the finances involved. In 1930-31 the rates in Liverpool came to 14s. 7d. in the £ as compared with an average of 15s. 4d. for the years 1926-27 to 1930-31. These figures included a general rate, poor rate and water rate. The city's total municipal expenditure in 1930-31 was £12,600,000, or £14 15s. 0d. per head, with a surplus of £34,000. The total net debt (31st March, 1931) was £38,250,000, or £44 14s. 0d. per head.

The Corporation owns Tramway, Omnibus, Water, Electricity and Market undertakings and the accounts of all, except the 'bus services, showed a profit in 1930-31. In the development of municipal housing the policy of the department concerned has earned for Liverpool well-deserved fame. No fewer than 26,400 houses have been built, nearly all since 1919, and one in eight of the population are Corporation tenants.

Wallasey, the most residential and least industrial of the Merseyside County Boroughs, has the highest rateable value per head, viz. : (£8 3s. 0d.). Liverpool comes second, and Bootle and Birkenhead, with very little between them, come third and fourth.

Footnotes to Part I, § I.

* The list is separated into two parts, A and B. The main tables in the Report, and that part of the text which is based upon the tables, relate only to the areas recorded under A. The remaining areas have been dealt with separately, in a brief Supplementary Report, because the employment figures relating to them did not become available until the analysis of the main body of statistics had been carried some way. For the same reason the main tables cover a period of years ending in 1930, but it has been possible to quote also some figures for 1931 (mainly in the text) after the Report was virtually completed.

† "Rates levied in various towns, 1930-31" by the Borough Treasurer of Preston.

§ This and the remaining figures in this paragraph are taken from "The Finances of the City of Liverpool, 1930-31" by the City Treasurer.

§ II.

(i) Industrial Character of the Area.

Liverpool is pre-eminently a port, the centre of a great maritime and distributing industry. Out of 381,000 insured workers on Merseyside in 1930 no fewer than 193,000, or over one-half, were attached to industries associated with Shipping, Transport and Distribution.* The proportion of workers so engaged in the country as a whole was less than one-quarter (see Table 1).

The great primary industries of Agriculture, Mining and Quarrying, which, together with Fishing, absorbed 14 per cent. of the whole occupied population of England and Wales according to the Census returns of 1921, are almost non-existent on Merseyside. Agriculture is not an insurable occupation; but Fishing, Mining and Quarrying provided employment for one out of every eleven insured workers in Great Britain and Northern Ireland as against one out of a thousand on Merseyside.

Consider next General Service, which is a heterogeneous group comprising all professional workers; insured persons in the service of the Government or Local Authority; engaged in the provision of water, gas and electricity; on trams and buses; serving in hotels and cafés; and in laundries. Since the purpose of these services is to supply the needs of the local population, which cannot differ much from the requirements of the rest of the nation, it may be expected that the proportion engaged in them will be much the same as for the whole country. This group represents in fact about 12 per cent. of all insured workers, and 13 per cent. of all employed insured workers, both on Merseyside and in the country as a whole.

Building and Furnishing must likewise tend to occupy about the same proportion of workers here as in the remainder of the country. These, together with certain allied industries, account for 10 per cent. of the insured and employed on Merseyside as against 14 per cent. in Great Britain and Northern Ireland.

There remain four groups of more purely manufacturing industries. Metals and Engineering provide employment for only 6 per cent. of all insured workers as compared with 15 per cent. in the whole country; and the Clothing group employs only 4 per cent. as compared with 14 per cent. On the other hand, the Food and Miscellaneous groups of manufactures each attract about 8 per cent. of the insured workers in this area as compared with only 4 or 5 per cent. in Great Britain and Northern Ireland.

Although the manufacturing industries in Liverpool are relatively small in size, they cover an immense variety of products. Proximity

to the sea, a ready labour supply and easy access to all raw materials, however bulky, have combined to enable virtually any industry to make a start and survive in Liverpool and the surrounding districts. The industries most attracted to the port are in general those which deal with heavy raw material, for they gain here a competitive advantage over those situated in towns not served by water transport. As instances, there may be mentioned flour-milling, oil, soap, oilcake and cattle-food, sugar refining, and electrical and other mechanical production. In addition to these, there are the manufacturing industries customarily associated with a port or shipping, as for instance, the manufacture of steel plates for shipbuilding and repairing; ship-parts and machinery; and nautical instruments. There is, however, no single large industry established in this area comparable in size with Shipping itself.

TABLE 1.

INDUSTRIAL DISTRIBUTION OF INSURED AND EMPLOYED WORKERS.

Merseyside compared with Great Britain and Northern Ireland, 1930.

Industries associated with:—	Number of Workers.		Percentage of All Workers.			
	In-sured.	Insured and Em-ployed.	Insured.		Insured and Employed.	
	Merseyside.		Mersey-side.	Great Britain and Northern Ireland.	Mersey-side.	Great Britain and Northern Ireland.
I.—Shipping and Shipbuilding.	85,100	52,300	22·3	4·7	17·5	4·0
II.—Transport and Distribution.	108,100	91,100	28·4	18·8	30·4	20·6
III.—Building and Furnishing.	39,000	29,800	10·2	14·1	10·0	14·1
IV.—Metals and Engineering.	22,700	18,800	6·0	15·1	6·3	14·8
V.—Food, Drink, Tobacco.	34,000	29,100	8·9	4·2	9·7	4·5
VI.—Clothing, Textiles.	16,500	13,000	4·3	16·1	4·3	14·4
VII.—Miscellaneous Manufactures.	30,000	26,500	7·9	5·5	8·8	6·0
VIII.—General Service.	45,300	39,000	11·9	11·7	13·0	12·6
IX.—Fishing; Mining and Quarrying.	300	100	0·1	9·8	0·0	9·0
Total	381,000	299,700	100·0	100·0	100·0	100·0

TABLE 2.
UNEMPLOYMENT AMONG INSURED WORKERS.
Merseyside compared with Great Britain and Northern Ireland, 1930.

Industries associated with:—	Insured Workers on Merseyside.				Percentage Unemployed of Total Insured in Each Industrial Group.		
	No. Unemployed.	Percentage of Total Unemployed in All Industries.		Merseyside.	Great Britain and Northern Ireland.		
	1930.	1931.	1930.	1931.	1930	1931.	1930.
I.—Shipping and Shipbuilding.	32,800	43,840	40·3	39·9	38·6	50·5	27·9
II.—Transport and Distribution.	17,000	22,220	20·9	20·2	15·8	20·6	7·9
III.—Building and Furnishing.	9,200	12,480	11·3	11·4	23·6	30·8	15·4
IV.—Metals and Engineering.	3,900	6,570	4·8	6·0	17·4	27·8	16·2
V.—Food, Drink, Tobacco.	4,900	6,920	6·0	6·3	14·4	20·2	10·1
VI.—Clothing, Textiles.	3,500	4,450	4·3	4·0	21·1	25·0	24·4
VII.—Miscellaneous Manufactures.	3,500	4,610	4·3	4·2	11·5	15·4	8·5
VIII.—General Service	6,300	8,630	7·8	7·8	14·0	17·1	8·4
IX.—Fishing; Mining, and Quarrying.	200	210	0·3	0·2	58·4	56·8	22·5
Total	81,300	109,930	100·0	100·0	21·3	23·1	15·4

The industrial picture of Merseyside is thus very easily sketched. As the limitless porcupine array of cranes along its network of docks bears witness, more than half the working activity of this area is concerned with the shipping and handling of goods. Behind this vast stretch of docks there is found only:—(1) the general services of state, municipality, and private enterprise needed to serve the local population; (2) building and other industries required for local trade and accommodation; and (3) innumerable "port" industries not individually large, but widely varying in kind.

(ii) Unemployment in Different Industries.

Further light is thrown on the industrial situation by the figures of unemployment for each industry given in Table 2. More than 70 per cent. of the unemployment among insured workers in the area was, at the date of examination (June, 1930), concentrated in the first three groups, those associated with (I) Shipping, (II) Transport and Distribution, (III) Building and Furnishing; over 60 per cent. was in the first two, and over 40 per cent. was in the

first alone of these groups. This is partly due to the fact that the majority of workers on Merseyside are attached to these industries and partly to the fact that the two more important groups are so seriously affected by the acute industrial depression in other countries besides our own.

If we calculate the proportion of insured workers within each separate industry who were unemployed at the same date, and compare that proportion with the corresponding figure for the whole country, the result is even more striking. In every group except one, clothing, the percentage of unemployment on Merseyside was higher, generally very considerably higher, than in Great Britain and Northern Ireland. For instance, in Shipping and the associated industries, the figures for Merseyside and Great Britain were respectively 39 per cent. and 28 per cent. ; in Transport and Distribution they were 16 per cent. and 8 per cent. ; in Building and Furnishing they were 24 per cent. and 15 per cent. ; in General Service they were 14 per cent. and 8 per cent. ; for insured workers of all kinds taken together they were 21 per cent. and 15 per cent.

A year later the position was considerably worse ; the percentages for 1931 are given alongside those for 1930 for comparison. In the area as a whole rather more than one out of every five insured persons was out of work in June, 1930 ; this proportion had risen to about two out of every seven in June, 1931.

In view of the figures presented in Tables 1 and 2 it is clear that the great bulk of industrial activity on Merseyside is dependent upon world conditions, upon the magnitude of the imports and exports which pass through the port of Liverpool, and upon the trade and commerce to which they give rise. If we class groups III to VII together with IX as the productive industries, only 37 per cent. of all the insured workers in the area seek to gain their living by actual production, whereas in the country as a whole the proportion is nearly 65 per cent. The remainder are employed in transport, commerce, distribution, and in various forms of personal or public service. Furthermore, nearly three-quarters of the unemployment in the area is to be found in these latter industries.

The problem of the future of Merseyside thus breaks up naturally into two parts, and the major part—that concerned with shipping and distribution—is chiefly governed by conditions so far-reaching in character that only forces set in motion on an international scale can radically improve them. The effect of any purely local measures which might be taken would be insignificant in comparison, and it is necessary to stress this in order to preserve a right sense of proportion. It does not follow that even small measures are altogether without value and they should undoubtedly receive consideration. Moreover, the future of the area is bound up with other activities besides shipping and distribution. These also, though less important, are not unimportant, and it will be necessary to discuss

them in their turn. But it will be well to begin by examining the trend of recent statistics in order to ascertain the position held by Liverpool as a port, and the share it takes of the trade of this and other countries.

Footnote to Part I, § II.

* The best statistical measure of the industrial character of any area is obtained by determining the numbers of insured persons who are attached to different industries in the area. If it is desired to assess the vitality of particular industries it is necessary to make allowance in each for those insured workers who are not employed.

A count of the numbers of insured in each industry is possible once a year when all insurance books are exchanged round about July. The numbers unemployed are counted each week and, by subtracting the unemployed in a particular week from the insured, it is possible to arrive at the numbers employed in about 100 industries or groups of industries (distinguished by code letters) for which separate figures are given by the Ministry of Labour. Statistics relating to insured and unemployed, men, women, boys, and girls, for these 100 separate industries were kindly provided by the officials of the Ministry for Merseyside as a whole and they form the basis of Tables 1 to 6 in the text.

In order to get a clear view of the whole field, industries which have a certain affinity have been combined together in Table 1 so that the 100 odd groups have been reduced to 9. The precise contents of these nine groups can be discovered by reference to Tables 5 and 6 where, as in Tables 3 and 4, the 9 groups have been expanded to 36.

§ III.

(i) **Characteristics of Liverpool as a Port.**

The parts of Lancashire and Cheshire which are included in this Survey all border the estuary of the Mersey. If one considers the estuary as commencing below Widnes—Runcorn, it includes the following shipping centres:—

Ellesmere Port and Stanlow, Bromborough, Garston, Birkenhead, Liverpool.

With the exception of Ellesmere Port and Stanlow they are within the Customs Port of Liverpool, but it is usual to group Liverpool with Birkenhead and to consider the others as individual sub-ports. Ellesmere Port and Stanlow are situated on the Manchester Ship Canal and economically may be classed as canal-side centres rather than Merseyside centres proper. They are chiefly used for importing oil and for exporting Cheshire chemicals and certain local manufactures. Bromborough is a small new harbour on the Cheshire side of the Mersey constructed chiefly for the convenience of the industrial nucleus in that area.

Garston, south of Liverpool, is a comparatively new port owned by the L.M.S. Railway Co. It illustrates excellently the value of close co-operation between land and sea transport and specialises in the large scale import of timber, ores, and fruit, and the export of coal. General cargo is also handled. Birkenhead Docks, on the Cheshire side of the Mersey, may be considered purely as an extension of the Port of Liverpool. They are the seat of most of

Liverpool's export trade to the Far East and India, and include also services to South and East Africa. On the import side Birkenhead is an important reception point for grain, timber, oil and molasses. Liverpool Docks proper, which line the north bank of the Mersey estuary for some seven miles, are the theatre of the majority of Merseyside's seaborne trade. Liverpool combined with Garston and Birkenhead stands easily as the first port of the United Kingdom after London.

Viewed in relation to the sea-trade of Britain as a whole, Liverpool (i.e. the Customs Port of Liverpool) appears as one of the five great "general" ports of the kingdom. By a "general" port is meant one which normally trades equally with all parts of the world and handles all the commodities comprised in the overseas trade of the country. This is in contrast with the "specialised" ports which are more numerous and tend to trade each with one particular area, or in one particular commodity or group of commodities. Examples of such ports are Southampton which favours the North Atlantic passenger trade, and the South Wales ports which are particularly concerned with the export of coal and the import of timber and pit props. The total trade of the United Kingdom is shared between the major ports in the following proportions :—

	<i>Percentage.</i>		<i>Percentage.</i>
London (general port) ...	... 31.3	Southampton (N. Atlantic and	3.9
Liverpool " ...	... 25.5	Continent).	
Hull " ...	... 5.5	Swansea (coal, timber and	1.3
Manchester " ...	... 5.1	general).	
Glasgow " ...	... 4.2		

These percentages are obtained* by taking an average of the figures for three years—1924, 1926, 1928—before the present acute depression began. They show clearly the position occupied by Liverpool as compared with other centres of shipping activity. Liverpool and London together handle well over half the foreign trade of the country.

Although the general ports are concerned with practically all commodities and all trade routes, the individual relations which each has established with the various industrial centres of the country lead them to develop different aspects of trade in different proportions. This is a fact of some importance, for it helps to explain the differing degrees of depression characterising the various British ports. It is necessary, therefore, to examine the trade of Liverpool as it compares with London and other general trade centres.

(ii) Imports and Exports.

In the trade of the United Kingdom as a whole there is a marked excess of imports over exports. This is a natural characteristic of a country which pays for much of the foodstuffs and raw materials it buys from abroad by invisible exports. A typical British port

might therefore be expected to reflect this disparity between goods brought into the country and those sent out. An examination of the trade statistics relating to Liverpool, however, shows that over a period of years the values of goods inwards and goods outwards are about equal. In other words Liverpool has more than the average share in the export trade and stands to lose by a depression in British industry more immediately than do many other shipping centres. One may contrast its position with that of London which is above all an importing centre and on an average handles 38 per cent. of all the foreign goods entering the country but only 21 per cent. of the goods leaving it. Liverpool's dependence on industry is visible not only in the export trade but in the import trade also. An analysis of the trade figures for 1928, a fairly average year, shows that 98 per cent. of its exports were composed of industrial goods and 49 per cent. of its imports were industrial raw materials. As in that year exports and imports (excluding re-exports) were about equal, we may say that no less than 74 per cent., or nearly three-quarters of its total trade in 1928, was associated with British industries. It will thus be appreciated how vital is the dependence of Merseyside upon the prosperity of these industries.

It is not enough, however, to examine the broad figures of imports and exports. Depression is found to a varying degree in different commodities and on different trade routes. Some closer analysis is therefore necessary. Among imports of industrial raw materials to Liverpool the first place is easily held by cotton. It accounts for some 55 per cent. of Liverpool's imported raw materials and some 27 per cent. of the total import trade. In the export trade, too, cotton goods are much more important than any other single item. In 1928, before the depression set in, they represented 32 per cent. by value of the total exports from Liverpool. Combining the two figures we have 30 per cent. as the share of cotton in Liverpool's total trade. Hence the fortunes of Liverpool are closely linked with those of Lancashire: together they rise or fall.

It is unnecessary to rehearse here the list of other important commodities—raw materials and foodstuffs—which enter the port, and the multiplicity of manufactured goods which pass out from it; something will be said of them in the sequel. But it should be noted that, although Merseyside is itself a manufacturing centre of some importance, only a small portion of its produce is destined for export, and it would be quite impossible for Liverpool to depend on this alone as the raw material for its shipping trade. Practically all the goods handled in the port come from, or are destined for, Lancashire, the West Riding, or the Northern Midlands; and the trade of Liverpool reflects in particular the industrial condition of this section of England.

(iii) Direction of Sea Trade.

The direction of the Merseyside sea trade might be summed up in the statement "Liverpool shipping serves the world." This is one of the features which help to earn it the name of a "general" port. But, as in commodities, special preference is shown for certain sections. Thus, Liverpool is peculiarly bound up with the North Atlantic trade, the outward trade to India, and the trade to and from the East Coast of South America. In actual gross tonnage these constitute 60 per cent. of the total port trade and any decline in these quarters would affect Liverpool very seriously.

Mention must also be made of the passenger traffic to and from Liverpool. For long it was by far the greatest passenger port in England, but the rise of Southampton has recently caused Liverpool to take second place.

(iv) Main Features Summarized.

The main points of significance which appear from this short introduction are as follows :—

1. Liverpool is a "general" port and does not depend entirely upon the trade in one particular commodity or with one particular area.
2. Liverpool is the second port after London and on an average handles about a quarter of the total trade of the United Kingdom.
3. Liverpool is of more importance as an exporting than as an importing centre. (Imports = 20 per cent. of U.K. total; exports = 33 per cent.)
4. The port is above all an industrial port and no less than three-quarters of its trade is directly related to British industry.
5. Special note should be made of the importance of cotton and cotton goods (30 per cent. of total trade).
6. Liverpool owes little to the industry of Merseyside itself, but is essentially dependent upon the trade of Northern England as a whole.
7. Liverpool is the second passenger port of the United Kingdom.

Footnote to Part I, § III.

* These and other percentages in this section are based on figures given in the "Annual Statement of the Trade of the United Kingdom," a Stationery Office publication.

§ IV.

CONCLUSIONS RELATING TO INDUSTRIES.

The foregoing general description of the Merseyside area will serve as a background against which the main conclusions of this Survey may be outlined. The information and more detailed arguments on which these conclusions are based are contained in the second half of the Report.

Briefly, the central purpose of the Survey has been to throw light on two principal questions :—

(i) Is there in Merseyside a permanent surplus of labour? If so, what is the probable extent of the surplus?

(ii) Are there in Merseyside industries capable of expansion, or openings for the establishment of new industries?

Both questions relate to employment capacity, the one being concerned with the discovery of industries in which employment capacity has permanently declined, the other being concerned with the possibilities of increasing capacity.

Although when the enquiry was initiated it must have been recognised that there are very few industries for which an exact quantitative answer could be given to either of these questions, yet it was reasonable to assume that the mere statement of the questions in precise form, and the analysis of the trade position in each area with a view to their examination, must yield more valuable information than could be drawn from an enquiry having less precise point. The conclusions given here are not, and could not be, quantitative and exact; they are submitted rather as indicative of the general economic tendencies which may be inferred with more or less certainty from an analysis pursued logically and with a definite purpose.

First, it is desirable to summarise the position prevailing in each main group of industries separately. The attempt will then be made to combine the findings into one common result.

Following the broad division set out in Table 1, five main industrial groups have been distinguished and it will be well to recall here the position taken by each from the point of view of employment :—

<i>Group of Industries.</i>	<i>Number of Insured and Employed Persons in the Group as Percentage of the Total Persons Insured and Employed on Merseyside, 1930.</i>
A. Shipping, Dock and Riverside Service and Ship-Repairing.	17·5
B. Transport, Commerce and Distribution ...	30·4
C. Building and Associated Industries ...	10·0
D. Manufacturing and Production ...	29·1
E. General Service	13·0
Total	100·0

A. Shipping and Associated Industries.

(i) The Present Employment Position.

Employment in the *Shipping Industry* proper, that is, in navigation, was at about the same level in 1930 as in 1924.

In the *River and Dock Service*, the number of insured employed persons fell, during the period 1924 to 1930, 31 per cent.

In *Ship-building and Repairing*, the number of insured employed persons fell, during the same period, 27 per cent.

The Group as a whole showed the enormous unemployment figure in 1930 of 38.6 per cent. : in other words practically two out of every five insured workers were then unemployed. In 1931 the percentage had risen to 50.5.

(ii) *Causes of Depression.*

The depression until 1931 was stated to be one of "poor cargoes rather than restricted sailings." This condition partly explains the fact that employment in Shipping has been maintained, whilst employment on the Docks has fallen considerably. The decline in dock labour is due also in part to the introduction of improved cranes and haulage machinery.

The continuance of sailings despite the smallness of cargoes is explained, in turn, partly through the inconvenience and consequent loss that would be suffered by curtailing the passenger service and partly by the necessity for maintaining full service also along trade routes, inwards and outwards, throughout their length, although some sections of each route may fall far short of full activity.

Liverpool shipping normally carries exports and imports to an equal value. Until recently, exports had been falling; imports had been well maintained. The voyages both ways have had to be continued, but with poor cargoes on the outward journey. During this last year, however, the number of ships laid up has greatly increased and a sharp increase in unemployment is to be expected. This is effected partly by discharging crews when ships are laid up and partly by a general policy of reducing the number of hands on ships even when in commission. Office staffs have also been drastically reduced.

(iii) *Imports and Exports.*

The importation of most foods, including grain, sugar and fruit has been little affected by the depression. Meat imports have fallen, but only slightly. The import of raw materials on the other hand has shown a marked decline. This includes wool, ores, rough metals, but particularly cotton.

The failure of Lancashire cotton markets has led to a slump both in the import and export of cotton stuffs. In addition every large exporting industry in the manufacturing North—Wool and other Textiles, Iron and Steel, Coal, Engineering and Construction supply—appears to have been losing foreign trade. Liverpool Shipping has suffered in proportion to this decline.

(iv) *Prospects of Trade Recovery.*

Whether by chance, or through the tendency of economic ills to enforce their own remedy, recent monetary changes will for the most part re-act favourably on Merseyside shipping

The failure of wool exports from Australia has been one of the principal factors compelling that country to abandon the gold standard. The effect of this action, implying a cheaper Australian £ and therefore cheaper Australian goods, will be to stimulate the purchase of wool. Hence, Liverpool shipping will benefit.

The failure of British exports has been one of the contributing factors, though not the most important, leading to the abandonment by this country of the gold standard. This result, again, will tend to remedy the cause. The lower value of Sterling is a substantial stimulus to exports while it discourages imports, thus redressing the balance of trade. Moreover, it should adjust the "balance of cargoes" through Liverpool. The anticipated ultimate growth of the export trade, especially cotton manufactures, will be peculiarly advantageous to Merseyside shipping.

The effect of tariffs would certainly be to diminish imports into Liverpool and almost certainly but more slightly to diminish exports. Liverpool shipping would therefore be adversely affected on both these counts. It should be added, however, that a statement of the consequences for a single industry cannot be accepted as a general argument for or against a measure, and discussion of this subject will be resumed later.

The *status quo*, as regards monetary policy, is obviously of the greatest advantage to this most seriously depressed of Merseyside industries. Whether the abandonment of the gold standard, coupled with a policy of fiscal non-intervention, left to work out their effects over a period of years, could yield full prosperity again is a question on which widely different opinions might be entertained. At the close of this summary the problem of trade recovery will be further discussed; at this stage it will be necessary to *assume* some degree of recovery, in order to show in what spheres of employment it would have the most speedy and the most marked effect.

(v) *Absorption of Labour Surplus.*

In Shipping proper (navigation), much "slack" in employment will have to be taken up before increased trade can result in increased employment. Little impression will be made on the employment figures of Liverpool seamen and crews until at least the 1929 level of employment is again reached. Also, many companies have learnt in the hard school of economy that, by the adoption of new methods of work, a smaller staff can accomplish now what could only be done by a large staff in former days.

On the other hand, any expansion of trade will result immediately in greater employment among dock workers. The increase in employment may not be exactly proportionate to the expansion of trade, owing to the extent of casual work on the docks and the possibility of some extension in the hours of work; yet the employment position will reflect at once, in some degree, the trend of trade.

Shipbuilding and Repairing will respond to the change only after a considerable time-lag; but the ultimate extent of the expansion in this section of our first industrial group may be more than proportionate to the general recovery of trade. Shipbuilding is pre-eminently a "prosperity" industry, and shows wider extremes of fluctuation than the average level of trade.

In the Shipping Industry of Liverpool considered as a whole, the unemployment problem is likely to continue for so many years that it may reasonably be described, subject to reservations made later, as relatively "permanent." Even were the level of trade of 1929 to be restored, there would still remain attached to this industry an estimated surplus of some 8,500 insured persons. In addition to this figure—which itself includes some men who are out of work one day and in work the next—there is a very considerable element of under-employment at the docks which has come to be regarded as normal, though we shall venture to suggest that there is no justification for accepting the problem of casual labour as permanently incapable of solution in some degree.

As to the transfer of workers from one occupation to another, the question of practical importance is the *order* in which different industries will revive and thus reach the position of being able to attract unemployed men attached to other industries. Shipping will be one of the last to reach such a position. Indeed, it will need to be relieved of its own big surplus of labour; for its complete re-establishment depends not only on the full revival of North-of-England trade, but also on the restoration of world markets.

B. Distributive Services.

(i) *The Present Employment Position.*

The number of insured employed persons in *Wholesale and Retail Distribution* increased by the abnormally large figure of 25,000, or 50 per cent., from 1924 to 1930.

In *Transport, Storage, Commerce and Finance*, the number of insured employed persons fell, during the same period, 30 per cent.

In "*Other Road Transport*," there was a fall in insured employed persons of 18 per cent.

In *Railway Transport*, the fall was 26 per cent.

The unemployment percentage for the whole group, in 1930, was 15.8; in 1931 it was 20.6.

(ii) *The Causes.*

The immense increase in employment among wholesale and retail distributors is probably due in large measure to the intensified rivalry among producers to place their goods attractively before customers. During depression the one form of expenditure which remains remunerative to the manager of the individual firm is that which enables him to draw custom from his competitors. Thus consumers have recently enjoyed the almost abject attention of producers, but they have paid for it in higher retail prices than would otherwise have ruled; the cost of the extra service has been inescapable, and to some extent it accounts for the gap between wholesale and retail prices. It should be added that not all the additional employment among shop assistants is full-time employment. There has been an increasing tendency in recent years for large shops and general stores to take on extra labour—often their old hands who have married—for two or three days in the week, and in many cases these workers would draw unemployment benefit on their free days.

Any marked revival of trade may conceivably be accompanied by, not an increase, but a decrease in the number of persons employed in retail distribution. This follows as a corollary from the statement that the great influx of labour to this industry has been in part promoted by the depression. A factor which will partly offset this effect is the change in the type of the commodity sold, in particular, an increase in the sale of radios, motor vehicles, and other wares which require expert salesmanship and fairly continuous attention by the retailer after sales have been made.

The reduction of employment in Transport and Storage, Commerce and Finance, is the direct result of trade depression. The effect of the depression has been partly compensated by the increasing preference shown by distributors for road transport instead of railways. The total tonnage of goods handled at Liverpool, Garston and Birkenhead Stations fell by 15 per cent. between 1924 and 1930. In the same period the volume of road traffic on the ten principal roads out of Liverpool increased by about 80 per cent.

The 26 per cent. decline in railway employment has not been accompanied by unemployment of nearly such large proportions. The explanation suggested is that the Railways have reduced their staff through the restriction of recruitment rather than through dismissals. There remains no doubt a large "slack" in employment to be taken up before increased traffic will result in a substantial increase of staff.

(iii) *The Prospect of Recovery.*

The future of the Distributive group is bound up with the prosperity of the country as a whole and, for Merseyside in particular, with the development of the export trade with the outside world. Everything that has been said of shipping applies equally to distribution in this area, except in so far as the wholesale and retail

handling of goods is subject to the special, independent factors already indicated.

Owing to these exceptional influences, this group as a whole cannot be expected to absorb much labour during the immediate initial stages of trade recovery. Even a slight shrinkage may be expected in commercial travelling and marketing. Railway employment will not expand much at first. Road transport will provide new employment in proportion to increased trade; but this is a very small section of the group.

Needless to say, if business were to recover to the 1929 general level and beyond, all sections of the group would probably show some expansion. Yet owing to the surprising way in which the employment figures expanded in the wholesale and retail trade during depression, it would be rash to make any positive forecast of their movement during the phase of revival.

C. Building and Associated Industries.

(i) The Present Employment Position.

The number of insured employed persons in the *Building Industry* in 1927 was 62 per cent. greater than in 1924. This remarkable advance was not sustained, however; in the following year the increase in employment compared with 1924 was only 28 per cent.; in 1930 it was 31 per cent.

In *Furniture-making*, the number of insured employed persons rose, during the period 1924 to 1930, 25 per cent.

In *Sawmilling and Box-making*, the number of insured employed persons rose, during the same period, 12 per cent. There was similar improvement in the remaining associated industries.

Despite these large increases, the group as a whole showed an unemployment percentage of 23.6 in 1930. In 1931 it was 30.8.

(ii) The Causes.

Both the great expansion and the wide fluctuation in employment have been due mainly to changes in Government and Local subsidy and enterprise. In 1927 as many as 6,704 houses were built by public enterprise in the Merseyside boroughs, as compared with only 343 in 1924—this enormous increase being responsible for the 62 per cent. increase shown in employment. In 1930, the number so built was only 1,953; and there was again serious unemployment.

The high level of unemployment among builders in 1930 was due chiefly to this extreme expansion and contraction of public activity. It may be attributed in part, however, to the highly seasonal character of the industry which gives it a permanently greater unemployment average than most industries.

(iii) The Immediate Future.

The prospects for the Building Industry in the immediate future, i.e., for the coming 12 months at least, are altogether gloomy. The economy campaign of the Government has made a deep impression on Local Authorities and one of the first effects will be to lead them to reduce somewhat their housing schemes. It has not been possible to secure any precise information as to the expected reduction on Merseyside but it is generally thought that there can be no hope of maintaining the ambitious five-year programmes contemplated earlier.

A certain proportion of building contracts ordinarily come from charitable, religious and social movements. Societies dependent upon private subscriptions are suffering heavily from the present slump, however, and a retardation of their construction schemes is inevitable.

Private building enterprise, and especially trade construction, are affected by a depression after a time-lag. Delay is involved in the preparation and carrying out of building contracts after the necessary funds have been made available. The economy forced upon business in the present slump will be reflected in a lack of building contracts during the immediate future even though trade generally may revive.

All sections of the Building Industry will thus be facing a serious contraction during the coming year.

(iv) The more Distant Future.

Once expansion in Building and Construction begins, the development will be rapid. Not only does Building follow the movement of general trade with a certain time-lag; it follows, as a rule, to greater extremes. The ideal moment for the expansion of any one firm is the ideal moment for the expansion of all others. That moment is when a phase of prosperity is beginning and interest rates are still not prohibitively high. At such a time Building revives, and swings progressively to a high peak.

D. Manufacturing and Production.

It will simplify the conclusion in this section if only those industries are taken into account whose fluctuations are to some extent predictable on the basis of general trade conditions. This will involve the exclusion, for instance, of Merseyside firms which are branches of large firms having their headquarters elsewhere. The findings in respect of the more important groups of manufactures, thus limited, are summarised below under separate heads.

Metals and Engineering.

(i) The Present Employment Position.

In the *Miscellaneous Metals* group, employment among insured persons increased between 1924 and 1930 by 8 per cent.

In *Constructional and General Engineering*, the number of employed insured persons in the same period fell by 9 per cent.

In the *Electrical Industries*, there was a remarkable increase in employment in the six years, as much as 52 per cent.

Unemployment in the whole Metals and Engineering group was 17.4 per cent. in 1930. In 1931 it was 27.8.

(ii) Causes and Prospects.

The advance in Miscellaneous Metals took place despite the decline in steel production. The reason for expansion seems to be the efficiency of the local firms and their ability to make good use of the competitive advantages of Liverpool as a site.

The decline in Constructional and General Engineering has in the past been due to the high price of British compared with foreign steel. The attempt to support the home steel industry seems to have led the constructional section of British Engineering into frequent difficulties.

The rapid growth of the Electrical Industries has been due very largely to the development of an intensive interest in wireless.

All the above industries will reflect closely any improvement in trade and are favoured by the fall in the Sterling exchange rate. Constructional and General Engineering will probably show the most marked change, once the trade revival is well advanced, owing to its intimate concern with the making of "producers' goods," but there may be some delay in recovery.

Food and Drink.

(i) The Present Employment Position.

Employment in the *Bread, Biscuit and Cake Industry* was the same in 1930 as in 1924.

In *Milling*, employment improved 7 per cent. from 1924 to 1930. By 1931 there was a decline to 2 per cent. below the 1924 level, due probably to the dumping of flour in Liverpool.

In *Sugar, Confectionery, Cocoa and Other Foods*, employment fell 7 per cent. from 1924 to 1930.

In *Brewing*, there was a fall in employment, during the same period, of 23 per cent.

Unemployment in the whole group (including Tobacco) was 14.4 per cent. in 1930. In 1931 it was 20.2.

(ii) *Causes and Prospects.*

In the six-year period, 1924-1930, employment in this group of industries producing staple food commodities remained, as might be expected, fairly steady. Although change of habit caused changes in the different sections within the group, the net result was very slight.

Trade revival will influence food production to some extent; the sections which will probably benefit most are Sugar, Confectionery and light foods, and Drink.

Milling, though less affected by changes in general demand, benefits by the present increase in the price of foreign flour.

Clothing and Textiles.

Apart from Artificial Silk there is no spinning or weaving of textiles as ordinarily understood in this area, nor is there much wholesale manufacture of tailors' suits, or of boots and shoes. The lines included under this head are mostly side lines which are correctly so classified because of the materials used.

(i) *The Present Employment Position.*

Since 1924 there has been an almost continuous decline in employment in *Clothing*, the extent of the fall among insured persons by the year 1930 being 25 per cent.

In *Textiles*, excluding Silk, there has been a similar fall.

In *Tanning, Leather, and Boot Repairing*, the decline was 9 per cent.

The introduction of *Artificial Silk* is a bright spot in this gloomy picture. There were no persons engaged in the industry in 1924 on Merseyside; in 1930 it found employment for almost 2,600.

Unemployment for this whole industrial group was very heavy, 21.1 per cent. in 1930. In 1931 it was 25.0.

(ii) *Causes and Prospects.*

Universally, the complaint in these industries (excluding Silk) is the degree to which foreign competition is eating into the home market. The simplification of dress; the great increase in the demand for ready-made goods; the development of machinery to replace labour, especially in the manufacture of wearing apparel of all kinds; and the constant widening of the sphere of international competition are factors which not only restrict the market for British goods, but make it possible to supply that market with a more than proportionately reduced labour force.

These industries on Merseyside will undoubtedly respond to any recovery of general trade and they already benefit from the fall in the value of Sterling, since the most active foreign competitors are Germany, United States, Poland, Japan,* Belgium and Czechoslovakia, countries which still remain linked to the gold standard. Yet they cannot be expected to recover rapidly their 1924 level. The distance to be traversed is great and markets, once lost, are not readily recaptured. Nevertheless, ultimately a fairly extensive recovery of trade is to be expected.

Printing, Stationery, Paper.

(i) The Present Employment Position.

In *Printing*, there has been a steady increase in employment, the rise during the period 1924 to 1930 being 8 per cent.

In *Stationery, Paper* and *Paper Bag* manufacture, the number of insured employed persons fell, during the same period, by 27 per cent.

Unemployment for these two trades together was about 13 per cent. in 1930. In 1931 it was 16.3.

(ii) Causes and Prospects.

It seems probable that the expansion shown in *Printing* will accelerate in the future if there is a revival of trade. In general, the industry is not highly susceptible to fluctuations in external business; it supplies a specialised market which shows no great width of variation in good times or bad.

It is possible that some of the recent expansion in *Printing* has been due to the increase of advertising during depression, and that the advertisement market will shrink as trade recovers. There seems no reason to suppose, however, that this will offset fully the influences which will make for more rapid growth in this and allied industries when trade generally revives.

Conclusion Relating to Manufacture.

Manufacture is the only section of Merseyside activity that is directly and substantially affected by foreign competition. All other branches of industry—Shipping, Transport, Distribution, Building—provide service for which it is impossible to obtain a foreign substitute (except, to some extent, Navigation). Hence it is in relation to Manufacture chiefly that attention must be given to the effect of tariffs, and of fluctuations in the value of Sterling.

Taking a general view of Manufacture, we may say that there have been three phases in the fortunes of this group, due to three changes in national policy. In the first place, since 1925, when in order to resume the gold standard, the value of the £ was raised, British firms on Merseyside have been unable to withstand the gradual encroachment on their markets of foreign producers. This is especially true of Constructional and General Engineering, Clothing and Textiles, Leather and Tanning, and to a less extent of certain Foods. Then, the abandonment of the gold standard, accompanied by a fall in the value of the £, has reversed this situation for all the industries concerned and has given rise to a second phase of incipient expansion. The development due to this improved competitive position is, however, partly offset by the general contraction of world markets. A third phase may be said to be beginning now, i.e. November-December, 1931, following the introduction of tariffs. As is shown later, tariffs will affect the uniformity of the improvement, favouring one section of Manufacture and impeding another.

Considered as a whole, the prospects for this group may be said to be rather more hopeful than they have been for many years, provided that the existing policy is continued of allowing the sterling exchange rate to find its own due level. Moreover, the improvement is likely to be more marked than that in any other group previously examined.

It should be added that these findings apply with equal force to Chemicals, Oils, Soap, Paint, Tobacco, Rubber, and other important products which have been specifically excluded from this summary because they are produced by *branches* of large firms whose interests are not confined to this area. Although the share of Merseyside in the expansion of these manufactures cannot be predicted, it is certain that there will be some expansion, and that Merseyside will have some share in it.

E. General Service.

This group, though considerable in numbers, amounting to nearly 12 per cent. of the insured population on Merseyside, does not call for separate discussion in summarising the conclusions to which the Survey has led. It includes persons engaged in Hotels, Cafés, Laundries; in Entertainment; in Professional and Government Services; and in the provision of Public Utilities. Clearly there is a certain level of activity in these services at all times; but they will tend to be more active, if industry in general is prosperous; and economies may be called for in some, if not in all of them, if industry is depressed. Hence their expansion to absorb their own estimated large surplus of 6,000 unemployed is largely dependent upon outside economic conditions.

Footnote to Part I, § IV.

* Japan also has now gone off the gold standard.

§ V.

GENERAL CONCLUSIONS.

(i) Employment Capacity.

An answer may now be attempted to the two main questions towards which this enquiry was directed. Which industries on Merseyside have a permanent surplus of labour? And which industries, on the other hand, will be capable of absorbing this surplus?

By reason of the extreme mobility of labour* in this area it should be emphasised that no single industry can justly be regarded as possessing a permanent labour surplus as entirely its own reserve and responsibility. The industries on Merseyside are for the most part independent of highly skilled and highly specialised labour. Given an adequate number of men to direct operations and to do the skilled work, each can work effectively with a routine staff trained in other industries. In consequence, when there is a severe

depression, unemployment tends to be spread over the whole range of industries. The few expanding groups draw to themselves new labour; but if their activity increases in waves, or if for other reasons they have a high labour turnover, they rapidly accumulate an unemployment roll not much less than that of industries in depression. Artificial silk, a new and rapidly growing industry, had already 8 per cent. of unemployment in 1930, and this figure had risen to 31 per cent. in 1931. The only trades which succeed in preventing a surplus from gathering round them are those which rigorously control recruitment. On the Railways, for instance, in spite of a marked fall in employment from 1924 to 1930, unemployment was lower than in many expanding industries.

The labour surplus is not to be considered, therefore, as being in any true sense divided in definite proportions among the several industries. Unless this caution is held in mind, misleading inference may be drawn when, for convenience in describing here the movements of the labour force, the unemployed are treated as being actually attached to the industries in which they last worked and became registered. For this reason also, in estimating the ultimate labour surplus, no attempt has been made to subdivide the figures into other than broad groupings.

The conclusions on the two main issues are given in the following form :—

In the first place, a statement is made as to the probable order in which the industries on Merseyside will begin, or may in rare cases have already begun, to recover from depression and so absorb their own unemployed.

Secondly, some suggestion is offered as to the order in which industries will reach that point where, having absorbed their own unemployed, they will begin to be able to absorb the unemployed attached to other industries.

Thirdly, an estimate is attempted of the probable unemployed surplus on Merseyside, on the assumption that the 1929 level of production is restored, and of the distribution of that surplus among the various industries (it being understood, once again, that the notion of the existence of a definite distribution is to some extent artificial).

Up to this stage a condition of Government non-intervention is assumed, though with the realisation that the findings are therefore incomplete and unadjusted. In a final section an attempt will be made to assess the probable effect of tariffs and other arbitrary factors upon enterprise in this area.

(ii) The Order of Initial Recovery among Merseyside Industries.

In Table A a list is given of industries ranked in the order of their probable expansion to absorb their own surplus labour. Among the first to revive must be those which gain from the depreciation of

Sterling. This new condition has now been operating for several weeks and is already producing some effect. Of the favoured industries, the export section is likely to benefit more than those which compete with imports, for the active dumping in anticipation of tariffs has caused an exceptional accumulation of imports.

Thus, at the head of the list are included various exporting industries such as Chemicals, Oils, Soaps, Paints, Tobacco, and Engineering, constructional and general. These industries supply domestic as well as foreign markets and might be included again in the second group: namely, that of industries which compete with those abroad in serving the British market. This group includes Clothing and Leather, Milling, Rubber, Metals, Instruments and Toys.

Following these comes another group which would have ranked equally for second place but for its having a considerable internal "slack" of employment to take up before it can begin to absorb extra workers. For instance, in the Railway Service a staff has to be maintained that is not always fully employed, and, as traffic improves, all who before were comparatively idle now become active. This group of industries, having a "slack" of this character, comprises all branches of Transport, which must revive immediately the export trade revives. After the development has gone some way it will begin to find work for fresh hands. It is divided here into two sections, first, Transport by Road, and Dock Service, which are likely to absorb new labour fairly soon as trade expands; and, secondly, Shipping, Railways, General Transport, Commerce and Finance, which should follow the same course when their own rather larger internal reserve of partially active labour has become fully employed.

A fourth group comprises those industries which will expand as soon as the income of the consuming public as a whole begins to be less constricted. Some of these, again, especially the Electrical Industries and Furniture, include branches which might appropriately be placed higher in the list, because the groups are not water-tight; the same factors affect particular industries in more groups than one.

Industries which prosper when producers' income and enterprise expand form a fifth group, and include Building and Shipbuilding. The latter, as an exporting industry, might justly be included in the first group; but since a very considerable recovery in world markets would be necessary, in addition to the Sterling exchange advantage, to make shipbuilding really active, it may more reasonably be placed in group V.

The last group is made up of workers employed in Wholesale and Retail Distribution. As already indicated, the intense competition for trade due to the depression, and the consequent attraction to this industry of many workers who have failed to find openings in their own field, have combined to give it an artificial stimulus which will disappear with reviving trade. Those who sell will no

longer need to employ as much labour in seeking new custom and in keeping in personal touch with old customers. Hence, at first, there *may* be a contraction in the total of workers under this head. On the other hand, a continued expansion of production must ultimately be reflected in an increase also of the numbers engaged in buying and selling the goods produced.

TABLE A.
INDUSTRIES RANKED IN ORDER OF PROBABLE EXPANSION WITH TRADE REVIVAL.

	Industry.	Type of Industry.	(a) No. of Insured Em- ployed 1931.	(b) No. of Unem- ployed 1931.	(b) as per- centage of (a) plus (b).
I.	Chemicals Oil, Soap, Paint Tobacco Engineering, con- structional and general.	Partly exporting in- dustries which gain from the fall in the value of Sterling.	25,500	6,940	21.4
II.	Clothing and Tex- tiles Leather Milling Rubber Metals Watches, Instru- ments, Toys.	Industries competing with foreign imports into Great Britain and benefiting from the fall in the value of Sterling.	27,220	10,390	27.6
III.	(a) Dock Service Other Road Trans- port	Transport industries having little "slack" in employment.	21,690	19,710	47.6
	(b) Shipping Railways Transport, Storage, Commerce, Finance.	Transport industries having much "slack" in employ- ment.	27,380	17,480	39.1
IV.	Electrical Industries Construction and Repair of Motors Furniture Printing and Paper Food and Drink.	Industries which benefit from an in- crease in final con- sumers' prosperity.	36,770	8,850	19.4
V.	Building Bricks, Pottery, Cement, etc. Machined Wood- work, Boxes Shipbuilding.	Industries which benefit from an in- crease in producers' prosperity.	30,290	21,530	41.6
VI.	Wholesale and Re- tail Distribution.	Industries which ex- pand in depression and may contract during revival.	70,950	16,190	18.6

(iii) Industries which may absorb the Unemployed of Others.

A forecast of the order in which industries will begin to absorb unemployed from the general labour market will be much more speculative. It involves the consideration, not merely of the *time* at which each industry will draw in new staff, but also of the *rate* of absorption. Some industries, being late starters, may increase rapidly once in motion: Building, for instance. Moreover, each has a different amount of unemployment in its own field to absorb, and starts, as it were, with a different handicap. The forecast in this case can therefore be little more than general conjecture.

Since the lowest unemployment figure for any industrial group included within Table A is 13 per cent., it is evident that none will be in a position to employ labour from other groups until the general revival is well advanced. Such a process of external absorption of new labour is not likely to begin within a year or eighteen months, even assuming a fairly rapid rate of general expansion.

Among the early starters with little existing unemployment of their own to absorb are Chemicals, Oil, Soap and Paint. Since these industries are largely under the control of combines having wide connections, it cannot be said with certainty to what extent they will create fresh employment on Merseyside.

Next in order of complete recovery will probably be Milling, and Leather. These show the relatively low unemployment percentages of 16 and 18 respectively in 1931, and their home markets will tend to grow fairly quickly under the shelter of the fall in the £.

Next may be ranked certain industries which will recover when consuming power generally recovers: Electrical Industries, especially Wireless, Construction and Repair of Motors, Printing and Paper, Food and Drink.

Rubber and Tobacco may come fairly high in the list, though, again, the fact that they are partly controlled from outside Liverpool makes a forecast difficult.

The development of Artificial Silk makes the Clothing and Textiles group a more promising absorbent of labour than it would otherwise be.

The Metals group has shown some expansion in the past until the 1931 depression, and may recover quickly.

Finally, there are certain industries which, though destined to suffer seriously for the next twelve months, may subsequently recover swiftly. Among these must be included Building and the associated trades of Furniture, Bricks, Pottery, Cement, and Machined Woodwork.

The remaining industries may be regarded as not merely incapable of absorbing unemployed from the general labour market, but incapable even of absorbing the unemployed now shown as attached to them.

Industries Ranked in order of Probable Recovery to Absorb the Unemployed of Others.

- | | |
|--|--|
| 1. Chemicals.
Oil, Soap, Paint. | 4. Rubber.
Tobacco.
Clothing and Textiles.
Artificial Silk. |
| 2. Milling.
Leather. | 5. Metals. |
| 3. Electrical Industries.
Construction and Repair of
Motors.
Printing and Paper.
Food and Drink. | 6. Building.
Bricks, Pottery, Cement, etc.
Furniture.
Machined Woodwork, Boxes. |

(iv) New Industries.

Since 1924, approximately 70 firms, each employing 20 or more insured workers, have started work on Merseyside, and still remain active in 1931. Of these, about 60 firms, employing altogether 7,000 workers, were engaged in some kind of manufacture.

In the Clothing group, 17 new firms have been established. This includes two firms engaged in the production of artificial silk, which alone employ nearly 2,600. Engineering and Metals ranks next in order (including Wireless and other Electrical Industries, and Motor Repair), 16 new firms having been established in this group.

Nine firms have started since 1924, and still thrive, in the production of Oil, Paint and Chemicals, Paper, Printing and other miscellaneous goods. The same number have started in the group manufacturing foodstuffs. Building accounts for the establishment of a further 12.

The General Manager of the Liverpool Organisation has furnished the following list typifying the enquiries received from the Continent as to sites available in Liverpool :—

<i>Country of Origin.</i>			<i>Enquiries for Sites.</i>
			<i>Nature of Proposed Manufacture.</i>
Germany	...	...	Metal Novelties, Bronze Figures and Wireless Sets, Paper Works, Clothing Factory, Dry Battery Factory.
Holland	...	...	Fancy Leather Goods Factory, Dry Cell Batteries, Colour and Sample Cards.
Belgium	...	...	Metal Novelties, Wire Nail and Wire Factory, Paints and Varnish.
Austria	...	...	Silk Weaving Mill.
Czecho-Slovakia	...	...	Boot Factory.

The special advantages of Liverpool which should lead to an increase in the number of new firms attracted to this area may be briefly stated thus :—

(i) It is the second port in the Kingdom in size and provides exceptional water transport facilities both to foreign markets and to the great domestic market in the North of England.

(ii) The labour force is acknowledged to be highly adaptable to a wide variety of occupations. It is an all too ample supply, of both sexes and all ages; and it shows exceptionally high mobility, so that the general surplus of labour is a reserve for all industries.

(v) The Forces of Expansion.

The above recital of facts shows that, in many industries, employment capacity substantially increased from 1924 to 1930. It shows, further, that the expansion has been due in part to the establishment of new firms. And it shows, finally, that there are still enquiries, increasing in number since the fall in value of the £, as to the prospects of new sites in Liverpool. Were trade generally to revive, there would result new development both from within the industries now established on Merseyside, and from new enterprise arising in or migrating to this area. It remains to be considered what is the magnitude of the unemployment problem against which these forces of expansion are to be matched. In other words, we must now begin the examination of the "labour surplus" on Merseyside, and consider how much of it is likely to be "permanent."

(vi) Surplus of Labour on Merseyside.

In the Table below are given figures showing the amount of the labour surplus on Merseyside as follows:—

Column I gives an estimate, for each industry, of its *total surplus of labour* in 1931, i.e. the amount of unemployment in excess of what may be regarded as "normal." This "normal" is based on conditions in other parts of Great Britain in 1929: see pp. 160-163.

Column II gives an estimate, for each industry, of the amount of its 1931 surplus that may be attributed to the recent aggravation of the World Depression. (A simple statement of the increase in unemployment since 1929).

Column III gives an estimate, for each industry, of the amount of its surplus that may be attributed to local and other causes. (Column I minus Column II).

Surplus of Labour on Merseyside.

<i>Industries associated with:—</i>	<i>Total Estimated Surplus of Labour in 1931.</i>	<i>Estimated Surplus due to Recent World Depression.</i>	<i>Estimated Surplus due to Local and other Conditions.</i>
I.—Shipping and Shipbuilding	24,920	16,480	8,440
II.—Transport and Distribution	17,100	11,280	5,820
III.—Building and Furnishing	9,070	5,260	3,810
IV.—Metals and Engineering ...	5,410	3,810	1,600
V.—Food, Drink, Tobacco ...	5,270	3,760	1,510
VI.—Clothing, Textiles ...	3,570	2,560	1,010
VII.—Miscellaneous Manufactures.	3,460	2,220	1,240
VIII.—General Service	6,130	4,070	2,060
Total	74,930	49,440	25,490

As regards the last five groups in this Table, it is possible that they may expand during the prospective upswing of the trade cycle sufficiently to absorb at least their own existing unemployed. From the account given earlier of the probable order in which the industries are likely to revive, it is seen that these five groups are likely to be fairly early starters. They include many industries which will be favoured by the exchange rate position; and few of the industries in them have a serious internal "slack" of part-occupied workers.

The Metals and Engineering group contains several trades which had grown steadily up to 1930, and may reasonably be expected to advance again under the new stimulus.

Food, Drink and Tobacco have not a large surplus attributable to local conditions, and when the general slump recedes, will have little leeway to make up. Moreover, it includes such unsheltered industries as Milling and Biscuit-making which will benefit especially from the fall in the £.

The Clothing and Textiles group includes Artificial Silk, and may therefore grow to an extent more than compensating the recent decline.

Oils, Soap, Chemicals, Rubber, Paper and other miscellaneous products are comprised in the group which will gain most from the new monetary position. There is strong reason for believing that when the 1929 level is reached by the rest of the country, all such trades as these will be well in advance of their 1929 position. In 1929 their condition was relatively bad owing to their having suffered acutely from a five-years' continuous handicap; during the coming revival, not only will this handicap be removed, but a more than compensating advantage will be conferred on them through the lowering of the £.

The last group, General Service, though recovering only after a time-lag, may be expected to follow the average trend of industry as a whole, and to absorb at least the major part of its own labour surplus.

Concerning the recovery of Building, considerable doubts have been expressed earlier. It is evident that an immense surplus exists in this and the associated trades; and no reduction is likely in the immediate future. Yet this is the sphere in which, when movements are once under way, there is a swing to the furthest extreme. Were the rest of industry to recover to the 1929 position, Building, after some delay, would probably rise beyond.

We are left with two groups where the difficulties are most profound and the size of the problem greatest: Shipping, and Distribution.

In Distribution, wholesale and retail, there is some prospect that the labour surplus may actually increase as trade revives.

In Shipping, although there could be no such increase of the surplus, there is a very large "slack" of employment among those actually at work on board ship. In Dock Service the much desired decasualisation of labour would render impossible the absorption of many new hands as trade developed.

From the Table it is seen that, in 1931, Shipping alone accounts for a surplus of 25,000.

In Distribution and Transport other than Shipping there is a surplus of 17,000.

The surplus in these two groups exceeds that of all the remaining groups together. Thus, were these other groups to expand some 20 per cent. to absorb their own surplus, they would need to expand a further 25 per cent. to absorb the surplus from Shipping, Other Transport and Distribution. Such growth is obviously beyond reasonable hope.

Were there to be a recovery to the 1929 level of activity, there would still be a surplus of unemployed (in excess of "normal") of over 8,000 in Shipping, and about 6,000 in Distribution and Other Transport. These figures are probably under-estimates, since they take no account of rationalisation and its effect on the demand for labour in the years following 1929. They assume that the same volume of trade will require the same number of workers to handle it in all the processes of Transport and Distribution.

(vii) New Entrants into Industry.

It is clear that a vast problem of unemployment will weigh on Merseyside for many years. But the most serious feature of it has yet to be stated. If the number of persons of pensionable age leaving industry be subtracted from the number of young persons due to enter industry from school over the five-year period 1932 to 1936, it is found that Merseyside industry will have to provide scope for the employment of some 76,000 new workers. This figure is about equal to the whole present labour surplus on Merseyside due both to world depression and to local conditions.

Thus, even assuming an extensive recovery during the next five years, a recovery sufficient to permit Shipping and Distribution to reach their 1929 position, and all other groups to absorb their entire present labour surplus, there will still, at the end of the five years, be a surplus of labour greater than that which exists at present.

Coupling the number of new entrants with that of 14,000 still outstanding in Shipping and Distribution at the 1929 level, the immense labour surplus of 90,000 is shown for 1936.

(viii) Further Enquiries.

It is evident that, if there existed the means at the disposal of the Government for assisting Merseyside industry, further extensive enquiries would be justified of the following nature :

(i) Will the inflow of young persons into industry in the next five years result in a surplus of juvenile labour; or will it be compensated (a) by the increase in age of young persons at present employed and (b) by the tendency of juveniles to supplant adults?

(ii) In the event of the emergence of unemployment for one particular class of labour, are there industries which might be readily adjusted to absorb this class, if it be considered desirable?

(ix) Prospective Action.

It may be assumed that the ultimate purpose in view when co-operation was proposed between the Government Services and the Universities in the present enquiry was to throw light on the nature of the action—the immediate, practical measures—most appropriate for relieving any otherwise “ permanent ” unemployment revealed by the enquiry. Two types of action might be envisaged. The one would relate to the direct transference of workers from the depressed zone to others showing greater power of labour absorption. The other would be to achieve the same end through national fiscal and monetary policy, it being understood that, rather than transfer labour, it might prove easier through such national policy to divert the flow of trade towards the areas where labour is superabundant.

As regards the first mode of action, the present enquiry has yielded the following result :—

Assuming that trade in the country as a whole recovers to the level of 1929, there will remain on Merseyside, exclusive of the increase through new entrants, a labour surplus estimated to be not less than 14,000 and probably not more than 18,000. Of this, by far the largest part, and the only part which raises a special transference problem, is the surplus of those at present registered as belonging to Shipping, Other Transport and Distribution. The remainder does not seem to give rise to such a problem because, on the one hand, it would swiftly be absorbed if the recovery went beyond the 1929 level, and secondly, it is not of as specialised a type as that employed in many branches of Transport and Distribution. Its occupational mobility is so high that its absorption is automatic immediately there is expansion in any part of industry.*

The concern, then, is primarily with the surplus of about 14,000 estimated for Shipping, Other Transport and Distribution.

Concerning the second sphere of action—national policy in fiscal and monetary affairs—there are certain outstanding proposals before the country at present, and it would seem germane

to this enquiry to examine the proposals in the light of their influence on Merseyside. Indeed, the fortunes of this area are susceptible to influence more by national action affecting international trade than by any other means; hence the principal task in an enquiry such as the present, designed to throw some light on industry's future employment capacity, is to attempt some estimate of the effect of various national policies on the flow of trade through Merseyside and other related areas.

(x) Tariffs.

In these forecasts of the employment capacity of the various industries on Merseyside, no attempt has so far been made to account for the possible influence of tariffs. It is evident that our conclusions will require considerable modification if changes take place in the fiscal policy of this country. Whereas it is not possible here, whilst the policy is still under discussion and many tariff measures are subject to repeal or substantial modification, to attempt any precise statement of their probable effects, some general observations may be made as to the direction in which the above forecasts must be qualified as a consequence of the wide extension of tariffs.

It should be stressed at the outset that Merseyside is not representative of the country as a whole, and that while this area is likely to be injured by tariffs, on account of its dependence upon overseas trade, the same weight of evidence cannot, perhaps, be brought forward in those parts of the country which are wholly dependent upon unsheltered trades competing with foreign imports. The Table below, showing the considerable disadvantage of protection in one particular area, is therefore not to be read as an argument capable of deciding the best policy, for or against tariffs, for the country as a whole. Nevertheless, it is felt that it would be instructive if similar tables could be made for all the industrial areas at present in depression; for it is only upon such evidence that the true effect of protection on this country can be rightly judged.

The classification of the industries according to the manner in which they would be affected by tariffs has been made on the assumption that the protection would be of a very comprehensive type. Without such an assumption, no classification† whatever would be possible. But it raises certain difficulties. An industry like Engineering which has both a large foreign market and a large home market, may gain directly from a tariff sheltering its home market, and may lose from a tariff which increases the price of steel or causes foreign countries to retaliate against British engineering products. There are several industries in the list which are equally difficult to classify, e.g., Electrical Industries, Metals, Tobacco, Chemicals, Oil, Soap and Paint. It is not easy to say whether the Merseyside branches of these industries would be benefited or harmed by a national policy of protection.

*Industries on Merseyside classified according to the effect on them of a
General Tariff Policy.*

Type of Industry.	Industries included.	Number of Insured Employed.	Percentage of Total.
I. Industries which will gain, provided that they are not excluded from protection.	Clothing and Textiles; Boots, Leather, Tanning; Milling; Rubber; Metals; Electrical Industries; Chemicals; Tobacco.	36,730	14.6
II. Industries which will be little affected, except through a rise in the cost of living.	General Service, Hotels, etc.; Drink.	21,460	8.6
III. Industries which may be injured through an increase in their cost of production.	Building; Oils, Soap, Paint; Engineering, constructional and general; Furniture; Printing, Paper, Stationery; Food manufacture.	63,950	25.5
IV. Industries which will be injured through a diminution of international trade.	Shipping; Shipbuilding and Repairing; Dock and Riverside Service; Wholesale and Retail Distribution; Railway Transport; Road Transport; Other Transport; Storage, Commerce and Finance.	128,500	51.3

In the list of industries which would benefit directly from tariffs, if not specially excluded from protection, are Clothing and Textiles; Boots, Leather, Tanning; Milling; and Rubber; together with four others mentioned above, which, whilst possibly gaining from the protection of their home markets, may lose some of their export trade. These industries together employ about 37,000 insured persons.

A second group, comprising General Service and Brewing—industries little affected by tariffs except through the rise in the cost of living—gives employment to about 21,500.

In a third group, which includes Building, Furniture, and Printing together with others the classification of which is less certain, are placed the industries which seem likely to lose more from an increase in their costs than from a prospective safeguarding of their home market. These provide employment for about 64,000.

Finally, in a fourth group, which raises no difficulty of classification apart from the fact that the industries comprised in it may be injured both by a diminution of international trade and by an

increase in their costs, are assembled the main Shipping, Transport, and Distribution Industries. The chief disadvantage to these industries is the direct loss of carrying trade. They number about 128,000 insured employed, or more than 50 per cent of the whole.

(xi) The Balance of Trade.

In view of the bearing of a tariff policy upon the Shipping Industry in this area and the relevance of shipping income to the balance of trade, it may be well to note here certain indirect effects upon Merseyside of the attempt to use a *general* tariff as a means of adjusting the balance of trade. It is known that among the major causes of the existing tendency to an adverse balance of trade are :—

- (i) A continued fall in Shipping Income.
- (ii) A decline in interest on overseas investments.
- (iii) Reduced Government receipts, due to the Hoover Moratorium, and relief to the Dominions.
- (iv) Reduced commissions on international Banking and Insurance services.

These causes of the adverse balance, so far from being removed, will tend rather to be aggravated by the introduction of tariffs, since the object of tariffs is to restrict imports and the restriction of imports will obviously result in a further fall in shipping income; in injury to foreign trade and British investments abroad; in the protraction of the Hoover Moratorium; and in the slight further diminution of commissions on international Banking and Insurance. In this sphere there is no risk of being misled by laying emphasis upon the particular interests of Merseyside since they coincide with those of the remainder of the country. But the degree of injury to this area will be greater on account of its greater dependence upon Shipping, its heavy investments abroad, and the extent of its banking and insurance relations with other countries.

The adverse influence on this area of a general tariff policy may be increased by a further probable consequence: its effect on exports. The prosperity of Merseyside has been built up on the vitality of the great exporting industries of Lancashire and the North. The strength of these industries may be sapped, however, if the tariffs erected by this country lead to either of two results, both of which would check exports :—

- (i) a rise in the value of Sterling, or (ii) retaliation on the part of other countries by means of tariffs to exclude British goods.

(xii) Monetary Policy.

A second possible sphere of state action is of even greater importance. At the present time numerous competing schemes for the reorganisation of this country's monetary policy are being canvassed. Peculiarly important for Merseyside industry, in view of the wide international reach of its trade, is the proposal for the

stabilisation of currencies throughout an international " Sterling area." The suggestion is that were Great Britain to undertake to maintain the purchasing power of Sterling stable in terms of goods, a large group of other countries would be anxious to stabilise their exchange rates in relation to Sterling in order to share the advantage of its unchanging value. There would then exist an international field throughout which would prevail not only exchange stability but also stability of the purchasing power of money. Such a scheme would have obvious advantages for Merseyside, especially if this " Sterling area " were to embrace, as is thought possible, not only the Dominions and India, but also the South American Republics, Spain, Portugal and Scandinavia.

The outstanding result of the enquiry conducted in Liverpool has been to lead to the recognition that the one fundamental need of industry is the restoration of a sound basis for the renewal of confidence. It is true that departure from the gold standard, and the consequent improvement of international trade, has produced a temporary sense of relief. Yet if this is to be consolidated into confidence sufficient to give rise to new enterprise and new capital expansion, some assurance seems needed of a reliable basis, free from artificial restraints, for the continuous growth of both domestic and foreign trade. For Merseyside, indeed, with its " devastating torrent " of fresh industrial population for which work must be found within the next few years, anything less than this will not suffice and action directed to this end is urgent. The ultimate aim presumably, would be the formation of a " Sterling area " over which there would be not only stable currency conditions, but also general freedom for the mutual exchange of goods. But as a first step towards this position and one which would seem capable of achievement in the fairly immediate future, the formation of a " monetary union " among countries bent on remedying the recent catastrophe of deflation, and of replacing it by a regime of scientifically planned stabilisation, would have a profound effect upon confidence.

The fluctuations of currency in certain gold standard countries have recently rocked the whole world, and, if these countries were excluded from the measures proposed above, there would probably be further ground for confidence in their success. Until these countries are able, as well as willing, to control their national swing of trade and speculation, they will inevitably prove a barrier to the attainment of stability in all other countries that are bound to them.

There is therefore a growing belief that some degree of independence in this country is essential if fresh confidence is to be restored. It is true that no nation can stand isolated and aloof from all other nations. What is needed is some greater power of discrimination in forming connections which shall be sufficiently wide and single-minded to ensure a solid foundation for common and effective

action. Great Britain is indeed already united with many countries by desire for a parallel course of action; and to implement this potential partnership would seem the natural and indispensable course if the destinies of this nation are to be shaped upon an international frame. But though the area for united action may at first have to be thus limited the ultimate ideal is to achieve universal stable currency conditions. That is essential to the smooth running of the machinery of commerce and without it there can be no lasting confidence between nations.

Footnotes to Part I, § V.

* Apart from the statistics in the present report confirmatory evidence of this is to be found in an article based on data collected in the course of the Merseyside Social Survey and published in the "Economic Journal" June, 1931.

† It should be borne in mind that the effect of tariffs on the Merseyside section of a national industry may differ from its effect on the remainder of the industry established elsewhere. The clothing and textile industries of Merseyside, for instance, have very little export trade but compete with foreign countries in the home market. They are therefore likely to benefit from protection. The textile industries in the rest of Lancashire, on the other hand, depend mainly on export, and would be injured by tariffs. As a second example consider Merseyside Railway and Road Transport, which would be injured by a decline in international trade, but Transport in the rest of the country would slightly benefit if internal trade expanded. In the list in the Table on p. 41 the concern is purely with that section of each industry which is to be found on Merseyside.

PART II.

§ I.

Method of Enquiry.

The material upon which this Report is based has been obtained from two sources:—(1) data, mainly of a statistical character, provided by Government Departments, and (2) general opinions given by persons directly or closely connected with industry. The statistics supplied by Government Departments, especially those received from the Ministry of Labour, give more reliable evidence of the position in this area than could be discovered by any ad hoc enquiry. They indicate the trend of industry and trade in the recent past and to some extent they may be used as a guide to tendencies in the immediate future. Their reliability for this second purpose is, however, strictly limited by the difficulty of forecasting the probable development of political and other events on the national and international plane.

Valuable as these official statistics are it seemed desirable to supplement the conclusions reached from their analysis by consulting representatives of different industries and interests in the area as to economic conditions within their immediate experience and the relative influence of various factors upon them.

To make sure that no important firm was omitted from our Survey we obtained from the North Western Divisional Office of the Ministry of Labour in Manchester a list of all firms which exchanged in bulk 50 or more insurance books during the period 1924 to 1930 at Employment Exchanges located in the Merseyside Area and the majority of these firms were approached.

In view of the industrial character of the area, it was found convenient to group certain industries together and to pursue our enquiries within each group more or less independently. The grouping selected followed fairly closely the lines laid down in Table 1. It was :—

- A. Shipping and Ship-repairing.
- B. Distribution.
- C. Building.
- D. Manufactures.
- E. General Service.

Questionnaires were then designed to elicit information concerning each industry or trade from the firms and companies to be approached. With each form of questions was sent a letter, explaining the nature and purpose of the enquiry, and a personal note drawing attention to the importance of the subject and requesting that it might be dealt with by someone qualified to express an authoritative opinion upon industrial conditions as they affected the particular industry concerned.

Contact was made also with various representative bodies such as Employers' Associations, Trades Unions, Chambers of Commerce, Produce Brokers, The Lancashire Development Council, and the Liverpool Organisation.

We wish gratefully to acknowledge the courtesy with which our requests for information were received by the majority of those whom we approached, though not all of them could see their way clear to assist us. For some there were countervailing reasons rendering imperative their refusal to assist the enquiry. For others in the same industries, but presumably in different circumstances, there was less difficulty; and it may be said that but for their aid this Report would have had to be written wholly without enlightenment from contact with practical affairs. The co-operation liberally offered has been in many cases indispensable to an adequate understanding of the trade situation in this area, and is gratefully acknowledged.

§ II.

(1) General Review of Employment on Merseyside.

Before the employment situation is analysed industry by industry it will be helpful to show the broad tendencies or general trends in employment which have taken place on Merseyside in recent years. For this purpose further Tables have been prepared, each relating to some special aspect of employment.

The first, Table 3, brings out, in greater detail than previously, the importance of the various industries in the area as measured by the number of insured workers employed and the recent trend of employment in each. The next, Table 4, distinguishes those industries which have recently expanded from those which have declined. The remaining two Tables pursue this same question of the expansion and contraction of industries, but they are examined from new angles: Table 5 measures the movement of labour that is continually taking place between one industry and another, while Table 6 measures the displacement of one type of labour by another within any given industry.

The purpose of this general Survey is to direct attention to the main conclusions of these Tables, to note their importance and the light they throw on the moving picture of employment on Merseyside during the last seven years.

(ii) Trend of Employment in Various Industries.

In Table 3 the industries which were previously (in Tables 1 and 2) confined into nine groups have been now extended to thirty-six and they are arranged in order of importance as determined by the number of insured workers for whom they provided employment in 1930.* Also the trend of employment in each is shown in index-number form between 1923 and 1930, taking the position in 1924 as a standard which is denoted by 100. It is thus possible to see at a glance in which industries growth or decline has been consistent or variable over the eight year period.

TABLE 3.

TREND OF INSURED EMPLOYED PERSONS IN EACH INDUSTRY.

(Number employed in 1924 is represented by 100).

MERSEYSIDE, 1923-1930.

Industry.	Number employed in 1930.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.
Distribution	75,500	97	100	111	120	126	124	140	150
Shipping	20,800	102	100	118	116	118	118	110	100
Building and Contracting	20,000	106	100	120	136	162	128	133	131
River and Dock Service	17,500	100	100	86	89	85	70	72	69
Hotels, Laundries; Entertainment and Professional Service.	17,100	87	100	109	111	112	115	115	111
Oil, Soap, Paint, etc.	14,500	110	100	103	99	96	94	93	95
Shipbuilding and Repairing	14,000	104	100	86	91	84	75	82	73
Government Service, central and local	10,500	112	100	100	113	106	116	95	98
Bread Baking; Cakes	9,200	116	100	91	102	101	101	96	100
Sugar and Confectionery; Other Foods	8,000	89	100	114	117	111	106	116	93
Transport, Storage, Commerce and Finance.	6,600	119	100	104	99	84	85	78	70
Tobacco Manufacture	6,200	107	100	95	104	104	116	118	112
Printing	6,100	103	100	107	108	112	114	113	108
Gas, Water, Electricity	5,900	56	100	102	104	101	86	77	71
Miscellaneous Metal Industries	5,800	79	100	102	104	102	108	110	108
Electrical Industries	5,600	82	100	129	161	140	136	137	152
Constructional and General Engineering.	5,600	108	100	107	102	110	108	99	91

TABLE 3—continued.

Industry.	Number employed in 1930.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.
		Tram and Bus Service	5,500	—	—	—	—	—	—
Clothing	5,000	102	100	101	94	91	92	80	75
Other Road Transport	4,700	95	100	100	96	103	97	95	82
Railways	4,800	123	100	104	89	94	90	80	74
Oilcloth, Brushes ; Instruments, Toys, Sports.	4,000	95	100	88	76	118	112	115	102
All Textiles (not Silk)	3,600	97	100	94	90	86	81	82	75
Milling	3,300	84	100	102	94	103	98	103	107
Chemicals	2,900	126	100	72	86	89	87	86	84
Furniture	2,700	100	100	111	128	137	144	145	125
Drink	2,400	78	100	94	80	83	83	84	77
Boot Manufacture	2,300	100	100	104	100	102	104	96	91
Sawmilling, Boxes	2,200	108	100	111	106	107	111	106	112
Silk	2,200	—	—	—	—	—	—	—	—
Rubber	71	100	110	97	140	148	136	166	166
Construction and Repair of Motors	1,700	94	100	103	97	100	106	97	85
Pottery, Artificial Stone	900	80	100	114	126	134	134	132	109
Paper Manufacture, Stationery	800	92	100	104	112	125	112	125	73
Fishing	200	100	90	92	72	71	71	113	58
Coal, Quarrying	—	28	100	96	38	88	90	12	6

The first twelve industries in this list take in practically three-quarters of the insured workers in the whole of Merseyside, and the first five, accounting between them for one-half the total of insured workers, include not a single manufacturing industry in the usual sense of that term. Towering high above all the others stands "Distribution," which includes shop assistants of every kind as well as those engaged in wholesale establishments (if their pay is less than £250 a year). This industry provided employment in 1930 for one out of every four insured workers in the whole area or nearly four times as many as the next most important industry on the list, and its rapid and persistent growth since 1924 is a feature no less astonishing than its absolute size. It is necessary to point out, however, that while the order in which the different industries appear in the list is not without interest and significance, too much stress must not be laid on the priority of some industries over others, since to some extent the positions they occupy are determined by the particular groupings adopted. For instance, had we combined "Sugar, Confectionery and Other Foods," with "Bread Baking and Cakes," these two industries together would have taken the fifth place in the list instead of the ninth and eighth.

One expected to find Shipping high in the list, taking in all insured seamen and similar workers, but it is a surprise to see that Building and Contracting almost ties with Shipping for second place. Moreover, the increase in the number of building operatives since 1924, though not consistent, has been great while seamen have, on balance, not increased at all. It is equally surprising to find the rather mixed group of persons engaged in Hotels and Laundries, in the provision of Entertainment, or as Professional workers almost on a level in numbers with Dockers and all others employed about the riverside, and here also the lower group has

been steadily overtaking the one that is just above : since 1923 the riverside workers have shrunk by almost a third of their total while the others have expanded to nearly the same extent. Only now do we come to a Manufacturing group, namely, persons engaged in the refining of Oil, the manufacture of Soap, Paint, Glue, &c., with another maritime group again practically level—Shipbuilding and Repairing, which includes Marine Engineering. In this case both groups have gone down in numbers, but the latter distinctly faster and further than the former.

Government Service includes all who are not on the Establishment of the Central Government, such as temporary postmen, as well as those similarly employed by the Local Authority, such as school attendance officers and Corporation labourers. Persons engaged in what are usually termed the Public Utility services, the provision of water, gas and electricity, are shown separately in the list. Not all of them would be municipal employees : the provision of gas, for instance, in Liverpool is a private enterprise. Those employed on trams and 'buses are also shown separately in the list, for some of them also are municipal employees and others are not. (See p. 53, 2nd footnote.)

Under Transport, Storage, Commerce and Finance would appear such classes as carters, warehousemen, insurance agents, commercial clerks, another heterogeneous group largely dependent upon general trade conditions and therefore showing a marked diminution in numbers. Lower down in the list all the metal industries have been put together, and engineering (other than marine engineering) forms another group; it seemed advisable also to separate the electrical industries from the rest. The electrical industries have made great strides and the metal group has not done badly, but engineering has declined.

It is unnecessary to comment here upon the many interesting features of this list; each group of industries will be discussed in some detail later.

(iii) Comparison between Developing and Declining Industries.

In the preceding Table attention was directed to the amount of employment provided by each industry in 1930; in Table 4 emphasis is laid on the change in the amount of employment provided, all industries being arranged in order so as to show the percentage increase or decrease in employment which they registered in 1930 as compared with 1924. The Table brings into clear focus the types of industry which have expanded and the types which have declined over the six-year period, and corresponding figures are given for Great Britain and Northern Ireland so as to discover any difference there may be between the local movement and that for the country as a whole. Where the movement on Mersey-

side has been in the opposite direction to that for Great Britain and Northern Ireland the figures have been printed in italics to catch the eye.

TABLE 4.

MERSEYSIDE INDUSTRIES SHOWING:—(a) INCREASED EMPLOYMENT OR
(b) DECREASED EMPLOYMENT IN 1930 AS COMPARED WITH 1924.

A.—Increased Employment.				B.—Decreased Employment.			
Industry.	No. Employed in 1930.	No. Employed in 1930 as per cent. of No. Employed in 1924.		Industry.	No. Employed in 1930.	No. Employed in 1930 as per cent. of No. Employed in 1924.	
		Mersey-side.	G.B. & N. Ireland.			Mersey-side.	G.B. & N. Ireland.
Art Silk ...	2,200	—	154	Nat. and Local Government.	10,500	98	104
Rubber ...	2,200	166	114	Soap, Oil, Paint	14,500	95	104
Electrical ...	5,600	152	132	Confect. Choc. other Food.	8,000	93	102
Distributive ...	75,500	150	130	Engineering ...	5,600	91	97
Building and Contracting.	20,000	131	115	Tanning, Leather goods, boots, etc.	2,300	91	89
Furniture ...	2,700	125	127	Constr. and Repair of Motor Cars.	1,700	85	112
Tobacco ...	6,200	112	109	Chemicals ...	2,900	84	106
Wood-working .	2,200	112	98	Other Road Transport.	4,700	82	131
Hotels, Laundries, Profess, Enter'ts.	17,100	111	120	Drink ...	2,400	77	100
Bricks, Pottery, Cement, Glass.	900	109	105	Clothing, Millinery.	5,000	75	104
Printing ...	6,100	108	120	Textiles ...	3,600	75	77
Metals ...	5,800	108	94	Railways ...	4,300	74	81
Grain Milling ...	3,300	107	90	Shipbuilding and Repairing.	14,000	73	83
Oilcloth, Brushes.	4,000	102	110	Paper and Cardboard Box making.	800	73	107
Shipping ...	20,800	100	116	Gas, Water, Electricity.	5,900	71	98
Bread and Cake making.	9,200	100	107	Commerce, Finance; Communication, Storage.††	6,600	70	215
Tram and Bus Services.	5,500	—	136	Docks and River.	17,500	69	77

†† The statistics for this group included for the first time in November, 1925, persons insured under the Special Schemes for the Insurance and Banking Industries, which came into operation in July, 1921 and July, 1924, respectively. (The total of insured persons was thus raised from 100,000 to 220,000 in Great Britain.)

On examining this Table one is immediately impressed by the fact that the industries at the head of the list, recording the greatest expansion, are associated with what are largely post-war developments: motoring, large-scale electrical and wireless equipment, artificial silk, distribution (particularly in this area through the medium of large stores and multiple shops), municipal building, and related industries; while right down towards the bottom of the list, registering the greatest decline in employment, are found industries upon which the past prosperity of Merseyside was largely built, such as those associated with the river and docks, ship-building and repairing, commerce and finance.

The next point to notice is that, with three not very significant exceptions, every industry which showed an increase of employment on Merseyside showed also an increase in the country as a whole. The same is not true of the declining industries; in no fewer than nine cases out of seventeen Merseyside registered a decline where Great Britain and Northern Ireland recorded an increase in employment. Moreover, the range of expansion and decline was much wider on Merseyside than in the country as a whole. Of this the Distributive Industry, by virtue of its size and importance in the area, provides the most conspicuous example: it expanded from 50,000 to 75,000 in the six-year period, an increase of 50 per cent. as compared with 30 per cent. in Great Britain and Northern Ireland. In a sense this difference in fluctuation was to be expected, since the larger the sample, the greater the stability.

It is possible to account for some difference between the Merseyside figures and those for the country at large in most cases. For instance, the industries which stand at the head of the list owe their position to new firms starting and old ones developing in the area; it is true that similar development has taken place in the same industries elsewhere, but such expansion will have a greater effect upon the figures in the limited region where it occurs than in the whole country which contains regions where no such expansion has been experienced. Again, Building and the associated industries of Furniture, Wood-working, Bricks, Pottery, Cement and Glass, have been assisted on Merseyside by municipal housing schemes. On the other hand such groups as Hotels and Laundries, persons engaged in entertaining the public, Printing, Oilcloth and Brushes, Bread and Cake Making, Confectionery, Chocolate and Other Food, Drink, Clothing, Paper and Cardboard Box Making will have suffered more on Merseyside, since the depression there has been more acute than in the country at large. And it is the world-wide character of the depression which is responsible for forcing down towards the bottom of the list such primary maritime industries as Dock and Riverside Service and Ship-Repairing and other closely related groups such as Commerce, Finance, Communication and Storage, Railway and Road Transport.

(iv) Movement of Labour between Industries.

The next two Tables, 5 and 6, though compiled on the same principles for the eight main groups of industries, have been broken up into eight sections so that the figures relating to each group can be studied separately when the group itself is under consideration. Before proceeding to discuss these Tables it is necessary to explain the purpose they are intended to serve and how they have been compiled. It will facilitate the explanation if the figures for one section, say Distribution, are reproduced here as a sample :—

Incidence of Unemployment and Relative Attraction for Labour.

Numbers Insured in 1930.				Unemployment Index (Mean, 1923-30).		Index of Industrial Attraction (Numbers Insured in 1930 relative to 1924).			
Men.	Boys.	Women.	Girls.	Males.	Females.	Men.	Boys.	Women.	Girls.
45,930	6,610	30,100	5,010	61	74	155	117	129	105

In Table 5 indices have been calculated to measure the relative pull or attraction of different industries for workers young and old, of each sex. The changes which occur in the number of insured workers associated with any industry are analogous to those which take place in the ordinary population. There is a natural increase, or decline as the case may be, in the population of any country resulting from the process of birth and death; there is also an artificial increase (or decline) due to a net balance of migration to (or from) the country from (or to) other countries. So also in any industry we have two corresponding elements :—(1) Boys and girls leave school and enter industry for the first time, or young people already in industry grow to be men and women and so add to the totals of these two classes; on the other hand persons attached to industry in time grow old and retire or, while still young, they may leave the country or die. The balance of these different events produces what might be termed the natural increase of insured workers in industry. (2) More than the average number (judged by the "natural increase" of the industrial population) of persons may be attracted into a particular industry, or, persons already in one industry may be attracted to another. This second element might be termed "industrial migration."

In Table 5 we are concerned only with industrial migration. By a method which is explained in a note at the end of this section of the Report, allowance has been made for the element of natural increase; that has been removed, and we are left with indices which measure simply the attraction of each industry for men, boys, women and girls respectively. It will suffice here to explain how the Table of indices is to be interpreted, which is quite a simple matter. If the "Index of Attraction" for any class, e.g., boys, exceeds 100, the inference is that the industry

concerned had been attracting more than the average number of boys in comparison with other industries between 1924 and 1930; if the index is less than 100, the inference is that the industry concerned had been attracting less than the average number of boys in comparison with other industries. The deviation from 100 measures the amount by which the attraction exceeded or fell short of the average for all industries.

Now it is reasonable to suppose that workers are not attracted to some industries and repelled from others absolutely blindly; the flow of labour between industries will be governed, it may be assumed, at least in part by their recent experience. Industries which have been flourishing will attract labour and those which have been depressed will not. Moreover, buoyancy and depression can be measured by the incidence of unemployment over a period of years.

But, it may be asked, how are we to judge whether the unemployment recorded for any particular industry is high or low? Here, again, the procedure is simple. We first of all calculate the amount of unemployment experienced by all insured males, no matter to what industry they are attached. That supplies us with a standard which we can denote by 100. Knowing then the amount of unemployment experienced by males in some particular industry, we can measure that against the standard for all insured males. If it exceeds the standard it will be denoted by some number greater than 100.

Such "Indices of Unemployment" have been calculated** for each industry and they are to be read as follows: if the male index for any industry exceeds 100, the inference is that the industry concerned has been suffering more than the average amount of unemployment over the period 1923 to 1930 in comparison with other industries; if the index is less than 100, the inference is that the industry concerned has been suffering less than the average amount of unemployment in comparison with other industries. The deviation from 100 measures the amount by which the unemployment experienced exceeded or fell short of the average for all industries.

(v) Displacement of one Type of Labour by Another.

Percentages employed in Distribution by Sex and Age, 1924 and 1930.

Numbers Employed in 1930.				Years.	Percentages Employed.			
Men.	Boys.	Women.	Girls.		Men.	Boys.	Women.	Girls.
38,050	5,840	26,960	4,670	1924	46	9	38	7
				1930	50	8	36	6

In addition to the flow of labour which is continually taking place between industries, determined, it has been suggested, by the relative attractiveness of each kind as compared with others,

there are also forces at work dependent less upon external conditions and directed rather towards economies within individual industries, causing sometimes replacement of adults by juveniles, and males by females, or vice versa. This displacement is not always effected directly by dismissing one class and taking on another: the same result may be achieved by systematic selection exercised as vacancies occur, or by planning not to replace employees of a particular class when they leave. The combined effect of all such operating causes upon the relative numbers of men, boys, women and girls attached to each industry is measured in Table 6, where the proportions of each class in 1924 and in 1930 are compared. An example for one industry is given above. The actual numbers of each class employed in 1930 are also shown so that it is a simple matter to judge their relative importance. Where the numbers involved are small or where the changes in proportion are slight from 1924 to 1930 no great significance should be attached to them.

It will be of interest now to study the statistics recorded†† in these tables for each industrial group in turn, and to examine graphs which have been drawn showing, for males and females separately, the trend of the number of insured persons employed and the percentage unemployed year by year from 1923 to 1930 in each industry. We propose at the same time to discuss any evidence that may have been obtained as the result of our enquiries, by questionnaire, interview and otherwise, concerning the present conditions and future prospects of each industry. When such evidence exists it will serve to confirm, or possibly to correct, the impressions formed from the statistics recorded in Tables 5 and 6 and in the earlier Tables.

Footnotes to Part II, § II.

* Old age pensions, on a contributory basis, have since 1928 become available for insured workers at the age of 65, whereas previously they were only available, on a non-contributory basis, at the age of 70. This to a slight extent affects the comparability of the figures before and after that date. A strict correction is impossible but some allowance has been made for it by subtracting from the earlier figures of the insured and employed the numbers between the ages of 65 and 70, which had to be estimated. The estimate was based on the proportions between these ages in the occupied population as recorded in the 1921 Census and in the unemployed population as discovered in a random sample of the unemployed claimants to benefit analysed by the Ministry of Labour in 1927. The errors which remain can only be slight and are not likely to affect seriously the general trend of employment.

† The practice in regard to this group has varied. Sometimes those who were municipal employees have been counted under "Government Service" and sometimes they have been counted under "Tram and 'Bus Service." For that reason indices showing the trend of employment have not been calculated for the latter group and the indices shown for the former probably reflect these changes in procedure. The tables do not include persons on the establishment of the Government service, national or local, who are "excepted" from the Unemployment Insurance scheme.

‡ The manufacture of artificial silk is a new industry in the area since 1924.

§ Owing to a difference in classification in the two years the figures for 1924 and 1930 cannot be compared, but the development of motor transport in the area would certainly carry this industry well up the list.

|| Boys and girls become insurable on attaining the age of 16; they become insurable men and women, as defined in the Report, on attaining the age of 18.

¶ The whole of the insured population on Merseyside, whether employed or unemployed, in 1924 and 1930 was sub-divided into men, boys, women, and girls, and the number of each in 1930 was expressed as a percentage of the number in 1924. This provided for each class an index of "natural increase," since the element of "industrial migration" is of course absent when all industries are combined. It was found that between 1924 and 1930 the numbers of insured men, boys, women, and girls had risen from 100 to 107, 114, 110 and 129 respectively. (Incidentally it is possible that the high figure for girls is partly accounted for by the unemployment which has been so prevalent among the heads of families; this may have attracted young girls into the labour market who otherwise would have remained at home: the extra earnings would be an addition to the family's slender income).

The process described at the beginning of the above paragraph was repeated for each industry in turn. The indices so obtained contained two elements: one, the result of natural increase, and the other, the result of industrial migration. But we already know what part to attribute to natural increase for each class of labour. The natural increase for men, for instance, was 107 and, if we measure from this level, we can determine what part of the index for men in any particular industry is due to migration to or from other industries:—the number of insured adult males engaged in the Distributive industry rose from 27,580 to 45,930 between 1924 and 1930, an increase in the proportion of 100 to 166; whereas insured males as a whole engaged in industry of all kinds rose in the proportion of 100 to 107. Now 166, expressed as a percentage of 107, becomes 155. This last figure, therefore, has been taken as a measure of the net migrational transference of adult males to this industry, the difference between those attracted to it from other industries and those attracted from it to other industries. Exactly the same procedure has been followed for boys, adult women, and girls, and the indices of "Industrial Attraction" so calculated are shown for each separate class in Table 5.

** Indices of Unemployment were calculated as follows:—the percentage of unemployment among insured persons, round about July of each year, 1923 to 1930, was determined for males and females separately in each industry from the statistics supplied by the Ministry of Labour, and the mean of these annual percentages was taken. The same calculation was then made for all insured males, and all insured females in the area irrespective of the industries to which they were attached. These last means supplied standards which could be represented each by 100 and with which the previous means could then be compared. To take an example: in the Distributive industry, among males, the mean percentage of unemployment for the eight years 1923 to 1930 was 12·4 per cent.; for insured males in general the mean percentage of unemployment during the same period was 20·2 per cent. Expressing 12·4 as a percentage of 20·2, we obtain 61 as the index of unemployment among males in this particular industry, as compared with that experienced by males in general which is denoted by 100.

†† Indices of industrial attraction and of unemployment have only been calculated in Table 5 for any class of labour if there were at least 200 insured persons of that class recorded either in 1924 or in 1930. In interpreting the results three points should be borne in mind which may have some effect upon the figures and may necessitate some qualification of the conclusions reached:—

i. The classification of insured persons used in forming the tables is an industrial, not an occupational, classification. Thus a maker of cartons in a subsidiary department of a food factory would be probably classified under food manufacture, not under cardboard box making.

ii. The proportion of boys, girls, men, and women in any industry will be partly determined by the age distribution factor: e.g., the number of "boys" who become "men" is not the same one year as another.

iii. Wages rates in certain industries are governed by Trade Board regulations, as well as by custom, and generally advance according to a prescribed scale in the early ages. Insurance contributions likewise increase with age. Both these factors may tend to cause dismissals of young persons at certain ages.

§ III. DETAILED STUDY OF INDUSTRIAL GROUPS.

A. Shipping and Associated Industries.

(i) *Employment.*

If there is one group of industries that defines the economic character of Merseyside more than another, it is the group comprising Shipping, Shipbuilding and repairing, and Service on and about the Docks and Riverside. It is next to the largest of the eight groups into which the industries of the area have been classified: 85,000 insured persons were attached to Shipping and Associated Industries in 1930 as compared with 108,000 attached to Transport and Distribution, but this latter group is clearly dependent upon Shipping for its life blood. It should be added that a large proportion of these insured persons were not actually in work.

Of the industries that appear together in this group, Shipping itself, by which is meant Navigation, found employment for 20,800 persons in 1930; 17,500 were employed at the Docks; and 14,000 were engaged in Shipbuilding and repairing, mainly repairing.

Such figures reveal a very high incidence of unemployment when they are compared with the numbers actually seeking work in this group of industries, and the position was of course worse in 1931. In June of this year, out of all insured workers in Shipping, 45 per cent.; in Ship-repairing, 60 per cent.; and among Dockers, 50 per cent. were unemployed. The mean unemployment indices calculated for the years 1923 to 1930, and the accompanying graphs bear striking witness to the fact that the lack of work experienced is not a recent calamity. Moreover, it is not merely manual workers who have been affected: the closing down of some shipping firms and the transference of the headquarters of others to London have led to quite serious hardship among clerks and others of similar standing who, once unemployed, do not in these days find it easy to get a new start.

In spite of these conditions it will be seen from the graph that Shipping has continued since 1924 to attract more than the average number of workers. The explanation is that, had though trade may be, some ships must sail and officers and crew must be retained to man them. It is reported, however, that many of the ships which do sail have carried much lighter cargoes than usual.

This is reflected in the figures for those engaged on and about the Docks. Here unemployment in the last six or seven years has been practically double that for the generality of industrial workers on Merseyside. The consequence is that labour has been deserting the docks and seeking employment elsewhere. This, of course, can only be a temporary phase for, as soon as trade improves, the docks will inevitably attract again as many as before of those who think they stand the gambler's chance of an odd day's

work in a crowd. This problem of casual labour is one of the running sores of the riverside industries in Liverpool, and a special section is devoted to its consideration.

In no industry, except Dock Service, did males experience more unemployment during the period under review than in Shipbuilding and repairing and in general when there is depression in one industry men will be driven to seek employment in another where conditions are better. Hence a high index of unemployment frequently goes along with a low index of industrial attraction. Shipbuilding and repairing is no exception to this rule: the latter index for men is only 75, though the index for boys is 102. This suggests that when men leave they may, for motives of economy, to some extent be replaced by boys and this is supported by the figures in Table 6. Two young apprentices or learners would be obtainable for a sum appreciably less than the wage paid to a skilled, or even a semi-skilled man.

The employment figures we have quoted suffice to show that the condition of these three industries, which are typical of this great port, reveals more effectively than any other group the intensity of the depression which has fallen like a blight upon the district. In order to bring out their significance certain aspects of the Shipping Industry which is the key industry of the group will be treated in some detail.

TABLE 5 (I).

Incidence of Unemployment in Different Industries and their Relative Attraction for Labour.

Industry.	Numbers Insured in 1930.				Unemployment Index. (Mean 1923-1930.)		Index of Industrial Attraction. (Numbers Insured in 1930 relative to 1924.)			
	Men.	Boys.	Women.	Girls.	Males.	Females.	Men.	Boys.	Women.	Girls.
Shipping	27,720	930	1,560	40	114	97	104	113	125	—
River, Dock Service ...	31,710	250	320	—	196	30	79	63	137	—
Shipbuilding and Repairing, Marine Eng.	20,790	1,300	410	30	164	121	75	102	64	—

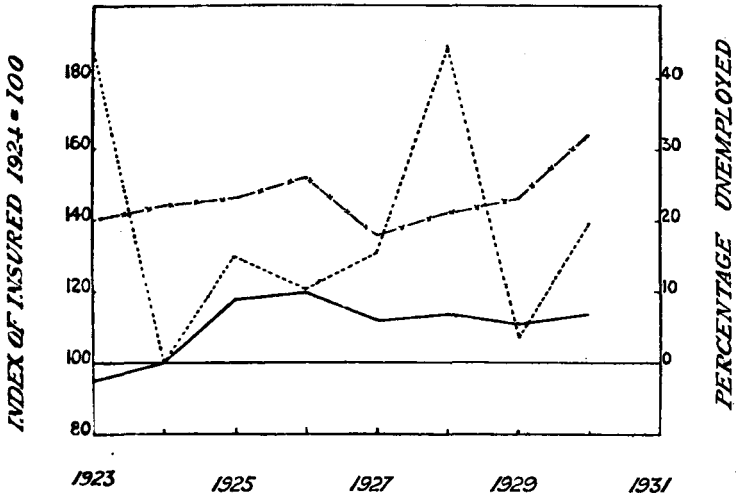
TABLE 6 (I).

Percentages Employed in each Industry by Sex and Age, 1924 and 1930.

Industry.	Numbers Employed in 1930.				Year.	Percentages Employed.			
	Men.	Boys.	Women.	Girls.		Men.	Boys.	Women.	Girls.
Shipping	18,620	780	1,370	40	1924	92	3	5	0
					1930	89	4	7	0
River, Dock Service	16,960	240	290	—	1924	97	2	1	0
					1930	97	1	2	0
Shipbuilding, etc.	12,490	1,140	320	30	1924	93	4	3	0
					1930	89	8	2	0

SHIPPING.

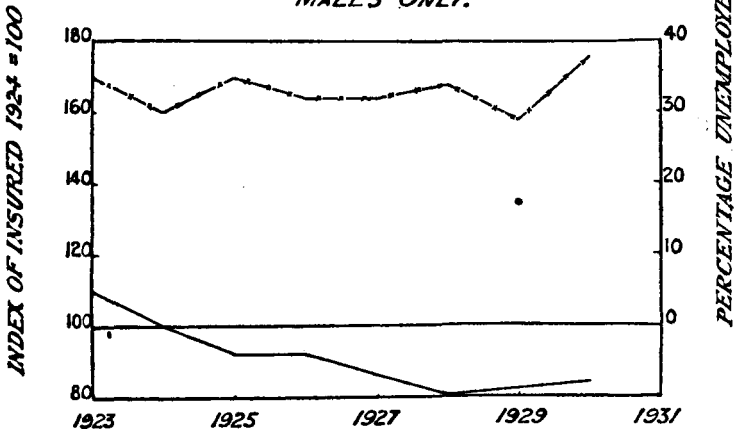
Index of insured persons and percentage unemployed 1923-30.



SHIPBUILDING, SHIP-REPAIRING, AND MARINE ENGINEERING.

Index of insured persons and percentage unemployed 1923-30.

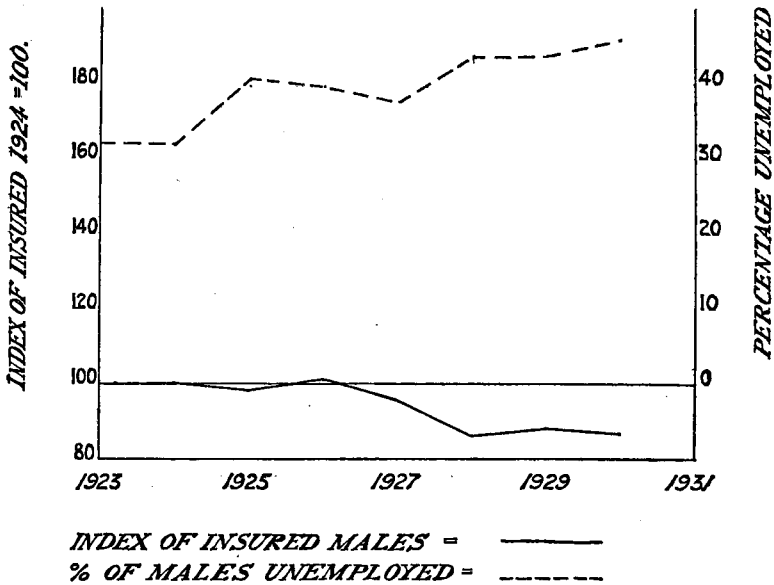
MALES ONLY.



INDEX OF INSURED MALES = ———
 % OF MALES UNEMPLOYED = -x-x-
 INDEX OF INSURED FEMALES = - - - -

CANAL, RIVER, DOCK AND HARBOUR SERVICE.

Males only.

Index of insured persons and percentage unemployed 1923-30.(ii) *Trends in Merseyside Sea Trade.*

On examining the trade of the port of Liverpool two fundamental points stand out: first, three-quarters of it are involved in attending to the needs of British industry; and second, one quarter of the total trade of the United Kingdom passes through Liverpool, a share sufficiently large to make the factors governing Merseyside trade almost identical with those governing British trade as a whole.

Although the amount of trade that comes to Liverpool is in part governed by the suitability of the port's organisation to particular trades, and by competition with other British shipping centres, these are not controlling factors in the situation. The port can be compared to a door in a factory; what passes through the door is chiefly determined by what goes on inside the factory, and not by the efficiency of the door itself. Hence the trend in Merseyside trade is closely related to the trend of trade in Northern and Central England.

The quantity of shipping entering or leaving the Docks is finally dependent on :—

- (a) the quantity of goods which need to be carried to and from foreign countries via Liverpool.
- (b) the number of passengers requiring to be transported via Liverpool.

It is not dependent on these, however, in a direct arithmetical ratio. A liner service—and Liverpool is primarily a liner port—must continue to operate even in the face of a severe drop in cargoes. Although it may only just be profitable to run the ship with the cargo offering, it is none the less necessary for the owner to keep to his schedule. A decline in trade is therefore reflected primarily in a decline in the number of tons of cargo per ship and consequently in the profits resulting from their voyages.

Until the present year this was particularly noticeable, and though by 1930 cargoes into Liverpool had fallen considerably there was no sign of a decline in the total tonnage arriving in and departing from the port. To this the following figures bear witness :—

*Tonnage of ships paying tonnage rates and harbour lights.**

1924	...	...	14·4	Millions
1926	...	...	14·7	„
1928	...	...	15·2	„
1929	...	...	15·5	„
1930	...	...	16·2	„

The only type of shipping which does vary in strict accord with fluctuations in cargoes is tramp shipping and it so happens that the commodities carried by tramps—grain, fruit, sugar and timber—remain little affected by the present depression. The actual tonnage moving in 1930 was therefore quite up to the standard of former years. It is unfortunate that figures are not available for 1931, it is possible that they would show a definite change for the worse. This is certainly true of the transatlantic passenger trade and of many cargo lines ; and during this year there has been a considerable reduction in the number of ships moving even on liner routes.

So far as our figures carry us, therefore, the depression in Merseyside shipping may be said to have been until recently one of poor cargoes rather than restricted sailings. To understand exactly how this comes about one must turn for information to the actual movement of different types of goods through the port of Liverpool. But before doing so it is instructive to consider for a moment the trends in the volume of trade at representative ports of the British Isles during the last few years, and to examine the relative position of Liverpool against this background.

The position is indicated in the accompanying graphs (see Diagram 1.) The general tendency, as shown by value figures adjusted with the aid of Board of Trade price index-numbers, seems to be that up to 1929 the trade of most British ports increased steadily, though at a slow rate. The graphs reveal a systematic recovery after the Great War. Liverpool and Manchester strike an odd note in that from 1925 to 1929 they did not expand, but rather kept a level course. London and Southampton, on the contrary, have enjoyed a peculiarly rapid increase of trade absent from the other ports examined. The following index-numbers† showing the 1929 trade figures (adjusted for changes in price) as a percentage of those for 1924, serve to indicate the relative prosperity of each port at that date.

London	...	131	Manchester	...	107
Southampton		145	Glasgow	...	115
Liverpool	...	101.5	Hull	...	111

These figures apply to the period immediately before the great slump, but even then Liverpool could not claim to have risen appreciably since 1924. In 1930, the last period for which Liverpool trade figures have been obtained, the drop from the previous year was one of 17 per cent. Unfortunately, corresponding figures are not available for other ports and it is impossible to indicate whether Liverpool has suffered from the depression more or less than other shipping centres. Except perhaps for the coal ports it is almost certain that Liverpool is amongst the most badly hit, for her trade is made up of manufactured goods and raw materials to the extent of 75 per cent. and these above all others have declined in volume since 1929. Industrial depression makes itself felt in both import and export trades, and up to 1930 there was no marked difference between the two in the extent of the decline. Certain sections of the import trade, however, mainly foodstuffs, have not responded to the general slump, and during the year 1931 it may be that this fact, in conjunction with the still greater decline in the export of industrial goods, will lead to a considerable superiority of imports over exports.

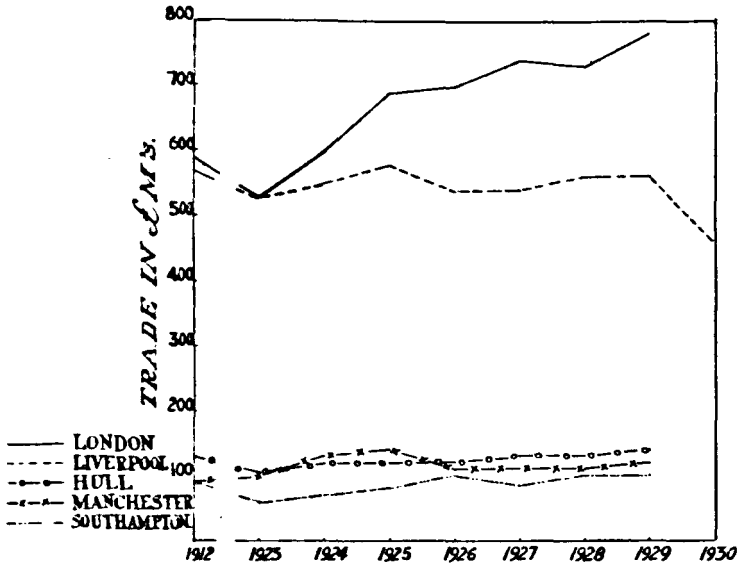
To sum up, these are the chief points in regard to the fortunes of Liverpool's trade as a whole :—

- (1) Up to 1929 the trade of the port was practically stationary; it showed an increase of only 1.5 per cent. over 1924. This is in contrast to most British ports which during the same period experienced a steady if not phenomenal rise, and particularly in contrast to London and Southampton which between the same years enjoyed increases of 31 and 45 per cent., respectively.
- (2) In 1930 Liverpool's trade fell by 17 per cent. (adjusted value figures). Comparative figures for other ports were not available.
- (3) To 1929 there was little difference between the export and import trades, but in 1931 the increased industrial depression may bring exports down to an appreciably lower level than imports.

DIAGRAM I.

COURSE OF TRADE AT DIFFERENT PORTS.

(Figures adjusted by aid of Board of Trade price index numbers.)



(iii) Imports and Exports.

The way is now clear to consider in rather more detail the significance to the port of the trade in particular commodities, export and import. To begin with a generalisation, one might say that exports of manufactured goods and imports of industrial raw materials have been very much reduced by world depression, but this is not true of imported foodstuffs. The following figures† indicate the relative position of foodstuffs, raw materials and manufactures at two dates, 1924 and 1930.

	<i>Imports into Liverpool.</i>		<i>Per cent. of total trade.</i>	
	1924.	1930.	1924.	1930.
Food and Drink	19	24	19	24
Raw Materials	28	20	28	20
Manufactures	3	7	3	7
<i>Exports from Liverpool.</i>				
Manufactures	43	43	43	43
Other Commodities	2	6	2	6

(iv) *Imports: Trade in Particular Commodities.*

A. Cotton.

Extent of Depression.

1930.

Value,† Decline from 1924	• 65 per cent.
ditto (adjusted for price changes)	26 „
Quantity,‡ Decline from 1924	20
	1929-30. 1930-31.
	30 per cent.

It should be observed that the fall in value (adjusted) for cotton imports is in fairly close agreement with the fall in quantity.

The depression in cotton is of fundamental importance to Liverpool as, under normal circumstances, cotton comprises 27 per cent. or so of the import trade and the 1930 depression therefore is equivalent to a decline of 7 per cent. in the total inward movement of goods. The figures below indicate also a decline in the proportion of British cotton imports passing through the port. It is stated that this might possibly be attributed to high dues at Liverpool in comparison with Manchester, but much of the Manchester trade is actually handled by Liverpool merchants.

Percentage of British Cotton Imports passing through Liverpool.

	1913.	1924.	1925.	1926.	1927.	1928.	1929.
Value† ...	76.3	76.7	76.9	76.8	76.1	74.0	73.7
Quantity‡ ...		1929-30.			1930-31.		
		76			70		

The decline is due to :—

- The slump in the prices of primary products which leads to restricted purchasing power abroad and therefore a smaller demand for cotton goods.
- Until recently, the inability of British mills to compete with foreign producers in overseas markets.

There is little difference in depression as between different sources of cotton supply, but both American and Egyptian produce have suffered very acutely.

Effects upon the Shipping Trade.—Cotton is a staple cargo on only a few trade routes, and therefore the decline has affected only a few lines. It has affected them, however, severely and ships trading to the Gulf of Mexico and Egypt (particularly Port Sudan) have experienced a considerable loss of trade. The tendency has been indeed to avoid the Mexican Gulf Cotton trade and patronise in preference the West Indian and Floridan fruit trade.

B. Meat.

Extent of Depression.

Decline in Value† (1924-1930)	per cent.
ditto (adjusted for price changes)	21
Decline in Quantity	20
	16

According to Board of Trade figures the fall from the 1924 average came in 1927 and, since that year, despite wide fluctuation the average meat import has remained fairly constant. Representatives of the trade, however, report that on the wholesale side there has been little or no decline since 1924 and that the industry cannot be described as depressed. On the other hand retailers complain of considerable depression in 1931, but they consider it to be largely due to the increased habit of fruit consumption and the decline in popularity of the large joint rather than to economic depression.

Effects upon the Shipping Trade.—Meat under normal conditions is the most valuable of Liverpool's imports after cotton and gives employment to a large fleet of refrigerated steamers trading to Australia and Argentina. Pig products are also included under this heading and these are a large element in the Irish trade. The Irish bacon trade at least is reported as being only slightly depressed; but, as no opinion has been received from shipping companies engaged in the carriage of meat in the foreign trade, the general position is difficult to estimate.

Three further points are worth noting :—

(1) In essence the meat trade is dependent upon the population of the hinterland served by Liverpool. Only when this increases can the meat trade be expected to increase also. None the less an increase in purchasing power in the North of England would stimulate the trade by leading to the substitution of hot joints for cold dinners.

(2) Though dues at Liverpool are high, the trade is not driven to other ports, since the rail haul to the northern centres of consumption would be more than the difference in port dues.

(3) Handling facilities at Liverpool are excellent.

C. Grain and Flour.

Present Position.—The grain trade like several other food trades is not depressed, and if one compares the quantity of grain entering Liverpool in 1930 with the average for the years 1924-27 the difference is only 1 per cent. Unusually heavy crops have led to phenomenal imports through Liverpool in the years 1929 and 1931 and it is probable that Liverpool has now reached a peak, for the revival of the Russian grain trade has flooded the market with abundant supplies of cheap grain.

Factors affecting the Trade.—Liverpool is the greatest grain marketing centre outside the U.S.A. and Merseyside is the second milling centre after Minneapolis—St. Paul. It therefore has a peculiar attraction for unsold grain, and after the normal demands have been satisfied much of the surplus is sent to the Liverpool and Birkenhead warehouses. As is natural the import fluctuates greatly with the success or failure of grain crops abroad.

There has been no decrease in the demand for grain. In times of depression, indeed, grain in the form of bread is consumed in preference to more expensive foods. Furthermore, the abundant supplies of cheap maize coming from Argentina have led to a substitution of this grain for the more costly manufactured feeds used by stock farmers, and maize is enjoying more popularity than for years past.

During the War, when Russian grain was no longer produced, a great expansion occurred in the acreage under grain in Canada, Argentina and Australia; now that Russian grain has again come into the market, the world has a crop too many and abundant supplies are always available. A restriction of supplies attempted by the Canadian Wheat Pool has been frustrated by the rise of the Russian export. One witness with some knowledge of the subject contended that Russian grain is not "dumped" and that its cheapness and fine quality have had a salutary effect in keeping the price of bread low during the present depression.

Effects upon the Shipping Trade.—The number of ships engaged in the carriage of grain has remained steady in accordance with the trade itself, but whereas some years ago much grain was brought to Liverpool from Canada and U.S.A. in liners, it is now handled in the main by tramp steamers from Russia, Argentina, Canada and Australia. Only some of these are British owned. In the Argentine trade British and Greek vessels predominate, while the Russian trade is mainly in the hands of Greek ships. The happy position of the grain trade is thus only a partial gain to British shipping, though the benefits to Liverpool as a port are very real.

D. Wool.

Present Position.—Under normal conditions wool is the fourth in importance amongst Liverpool's imports, but the type of commodity handled is in rather a different class from most of the wool entering England. For although considerable quantities of Australian wool enter the port, the majority is made up of coarse grades coming from India and destined for manufacture into carpets, blankets, and felts. The annual value figures for this class of wool cannot be adjusted with the ordinary wool index number and one must rely on the quantity figures, which show the following position:—

§Decline 1924-1930	...	...	...	...	36 per cent. (East Indian).
„ 1924-1929	...	...	...	...	10 per cent. „ „
„ „ „	...	...	...	...	19 per cent. (all types of wool†).

Factors affecting the Trade.—Liverpool is the ordinary market in Britain for all East Indian wool and the shipments handled here depend directly upon conditions in the East Indian wool trade as a whole. In 1931 the trade was reported as being practically at

a standstill until stimulated by the recent financial developments. Though the East Indian wool trade is anything but flourishing there is evidently more depression still in the Australian wool trade, for the total decline in wool, 1924-29, was 19 per cent., whereas the decline in East Indian was only 10 per cent. In this respect Liverpool will be less hard hit than London, for London is the British market for the finer wools as used in the textile industry generally and it is apparently these which have been affected most adversely.

Effects upon the Shipping Trade.—The extreme depression in Australian wool is one of the primary factors leading to the unusually severe restriction which the Australian trade has met. Although this trade is centred on London rather than Liverpool, the loss to Liverpool is none the less very considerable. The less severe depression in East Indian wool has an adverse effect upon the homeward liner trade from India, the same ships being affected as were affected by the decline in cotton passing through Port Sudan and the Indian ports.

E. Sugar.

Position of the Trade.—Though recent precise figures have not been obtained it can be confidently stated that sugar shows few signs of depression. In 1929 the quantity of the raw product imported through Liverpool represented an increase of about 80 per cent. over 1924 and since that date has been markedly superior to the import in any year previous to 1928. It should be noted, however, that the annual import fluctuates considerably and the year 1929 is probably exceptional.

Factors affecting the Trade.—The British sugar import trade is in the hands of a group of large combines and practically all sugar entering the country is bought by them in advance. The refineries associated with the combines are mainly in the regions of London, Liverpool and Greenock, and the import is divided between these three ports according to the requirements of the combines. In order of importance the centres are as recorded above.

In consequence the sugar trade is not open to ordinary competition between ports, and the import through Liverpool is therefore directly dependent upon the consumption of sugar in the hinterland. This seems to have suffered no decline in recent years, but the decline in price of the commodity has undoubtedly affected the trade rather adversely.

Effects upon the Shipping Trade.—Like grain, raw sugar is mainly carried in tramp ships and it is the tramp steamer which has benefited through the prosperity of the trade. As the ships are chartered in the international freight market, those vessels entering the Mersey with sugar are as frequently foreign (Italian and Greek) as British and therefore the Liverpool shipowner does not reap the whole of the benefit.

The sources of raw sugar are mainly the West Indies, Peru, Queensland and Mauritius. The sugar from Peru is in large part carried in British liners stationed on Liverpool, while that from Queensland is carried in British tramps. Some trade from Guiana also is carried in British ships.

F. Fruit.

Present Position.—The figures showing recent changes in the fruit import are very unsatisfactory. Ordinary value figures are available to 1929, but these are of little use as no index numbers are available with which to make adjustments for price changes. Owing to the variety of units a reliable quantity figure cannot be given. In the course of interviews, however, it has been pointed out several times that there is little or no depression in the trade. Such figures as are available would suggest a definite increase between 1924 and 1929 (some 50 per cent.) and in 1931 there is no talk of depression.

Factors affecting the Trade.—The fruit trade has benefited very considerably from the post-war habit of "eating more fruit." This is a definite change in the normal British diet and, despite decreases in wages and other depressing influences, the amount of fruit consumed still seems on the increase. Liverpool is the fruit centre for practically all Northern England and also for Ireland; and, as she possesses first rate marketing facilities, Liverpool holds a very safe position in the trade.

Effects upon the Shipping Trade.—Several classes of ships are employed in the carriage of fruit to Liverpool :—

(a) Specially built fruit liners engaged in the banana and grape fruit trade from the West Indies and Central America. These ships carry no cargo outwards but are concerned in the carriage of fruit alone. In 1931 it was reported that no decline had occurred. Most of this trade is handled at Garston.

(b) Fast fruit and cargo steamers of moderate size trading to Spain. No depression.

(c) Numerous tramp steamers of various nationality—but not generally British—which in the season carry fruit cargoes from Spain and Jaffa. In a good year the movement of tramp tonnage is very heavy, but, although Liverpool gains from the actual traffic through the port, the importance to British shipping is slight.

G. Hides and Skins.

Present Position.—Decline in quantity† 1924-1929=45 per cent.

Factors affecting the Trade.—The import is dependent upon the demand for leather in Britain, and for the export trade.

Effects upon the Shipping Trade.—Hides and skins come largely from Argentina and it is this trade which would suffer most from

any decrease in the import. Other areas dealing in hides and skins are Australia and South and East Africa.

H. Wood and Timber.

Present Position.—There was a definite increase in the quantity of soft woods imported in 1929, but that was an exceptional year. Quantity figures are not obtainable for 1930 and there may even have been depression in that year. There certainly is a general lack of confidence in 1931. An element of uncertainty has been introduced into the trade by the very considerable entry of Russian timber.

Effects upon the Shipping Trade.—If we may take it that the timber trade is slightly depressed only—though the decline in constructional work might seem to indicate the opposite—the port of Liverpool is open to gain considerably; for, despite her bad position in relation to Scandinavia and Russia, the populous nature of her hinterland should attract to the Mersey a heavy timber trade. As in the case of other tramp trades, however, British shipping suffers keen competition and in the carriage of timber Scandinavian vessels practically hold a monopoly.

We have now outlined the position in a few of the major import trades in which Liverpool engages. It must not be imagined, however, that this exhausts the list. There still remains a whole gamut of minor imports, some depressed, others flourishing. It would be too long a task to deal with them in detail, but it is worth noting that Liverpool has been for many years one of the chief centres for the import and for the re-export of tobacco. The production of vegetable oil and cattle cake was also numbered among the most valuable industries in this area, but recently it has not expanded here as it has done on the Continent, and Hamburg has become a serious competitor with Liverpool. The oil seeds and nuts required in the industry have long been the mainstay of the inward trade from West Africa. Petroleum, too, is imported at Liverpool, Birkenhead and Ellesmere Port in large quantities and there was no sign, at least until 1930, of a general decline.

(v) *Exports: Trade in Particular Commodities.*

We now come to the quarter in which Liverpool has suffered most severely. Considering the export trade as a whole it will be remembered that some 75 per cent. is made up of manufactured goods, and therefore the causes of depression in the shipping trade can be explained as well by the factory owner as by the shipowner. Liverpool can only handle what the manufacturer has to offer, and the only way in which the port can directly affect British trade is by the cost of its services in relation to the charge made by other ports for similar services.

A. Cotton Goods.

It has already been pointed out that cotton goods of various sorts (excluding apparel) constitute on an average about one-third of Liverpool's export trade. It is therefore important that the position of this trade should be examined in some detail.

Present State of the Trade.—Depression was until recently acute, as it was in raw cotton. An exact index of depression is difficult to give. Figures showing the total value of cotton goods passing out from the port are obtainable to 1930 and these show the position to have been as follows :—

	1924.	1925.	1926.	1927.	1928.	1929.	1930.
Value† in £ millions ...	111.6	105.4	87.3	79.7	76.5	71.6	43.4
Value adjusted for price } changes relative to 1924 } as base year. ...	100	103	108	105	91	91	68

These indicate a decline of 32 per cent. between 1924 and 1930 but the index number method of adjustment is not entirely satisfactory and further evidence is desirable. Liverpool handles just over half the British cotton goods exported and certainly until 1929 there was little or no decline in this proportion.

Further detail can be given concerning particular branches of the trade. That in piece goods is perhaps the most important. Here quantity figures are available and the question of price fluctuations does not arise. Expressed as percentages of the 1924 figures the recent trend has been as follows :—

	1924.	1925.	1926.	1927.	1928.	1929.
Cotton piece goods† (quantity } exported) ...	100	95.1	88.4	92.0	84.5	80.4

This indicates incipient depression in 1929 with a decline of 20 per cent. No later figures are available for Liverpool, but the U.K. figures for 1929-30 and 1930-31 (published by the Liverpool Cotton Association) should be almost identical in trend with those for Liverpool. With reference to the same base year, they are :—

$\frac{1929-30}{69.0}$	$\frac{1930-31}{39.3}$
------------------------	------------------------

Clearly then there has been an intensification of the depression in this section of the cotton trade these last two years and up to date it may be estimated as a fall of about 50 to 60 per cent. in quantity exported since 1924. This is perhaps the most depressed branch of trade in which Liverpool engages.

Secondly we have details for cotton yarns. These are assigned largely to the Continent and they are of rather less importance to Liverpool than cotton piece goods. Liverpool figures

take us up to 1929. For 1929-30 and 1930-31 we are again dependent on figures for the United Kingdom, and it should be understood that for these years the comparison is only of doubtful accuracy.

	1924.	1925.	1926.	1927.	1928.	1929.	1929-30.	1930-31.
Cotton yarns†‡	100	91.3	107	110.8	102.6	101.6	(91.5)	(78.0)
(quantity exported)								

Here again depression has come mainly in the years 1930 and 1931. The actual fall in exports, however, is not nearly so acute in this as it is in other sections of the cotton goods trade. Liverpool exports not far short of one-quarter of the British total and there has been no decline in this proportion in recent years.

Factors affecting the Trade.—The inability to sell British cotton goods abroad is due to different factors in different parts of the world. The United Kingdom piece goods export in the second and third quarters of 1930 and 1931 was geographically distributed as follows:—

<i>Main Countries of Destination.</i>	<i>Percentage of total exported.</i>	<i>Percentage decline 1930 to 1931.</i>
India and Ceylon	20.2	48.2
British S. W. and E. Africa	9.3	34.6
Australia	8.9	24.6
Argentina, Uruguay, etc.	8.6	34.2
Europe (except Scandinavia, Germany, Netherlands, Switzerland and Turkey)	6.1	29.5
Norway, Sweden and Denmark	4.0	6.0
Egypt	3.8	43.0
Switzerland	2.3	20.5
Germany	2.1	30.8

The general decline in the export of cotton piece goods from 1930 to 1931 was 36.4 per cent. and the percentage decrease between these two periods for different localities is shown above.

India and Ceylon are obviously the chief consumers of British cloth, and the figures quoted (except perhaps for the European countries) reflect also the decline of Liverpool's trade. The depression in the trade with India is due to:—

- (a) The great decline in purchasing power amongst the Indian population.
- (b) Competition of Japanese, Italian and Indian mills.
- (c) The boycott of British goods.
- (d) High prices (relatively) of British piece goods.

Of these there is no doubt that (a) is far and away the most potent factor. Neither the boycott nor foreign competition can compare with it in importance. The staple Indian commercial products, cotton, wheat, jute etc. are all down in price, many of

them by as much as 40 per cent. or 50 per cent., and as a result little profit is obtained by the peasants from their sale.

(b) Until recently the competition of certain foreign countries was a growing menace, but this has been partly nullified during the last month or so by the decline in value of the pound. Such competition occurred mainly in rough unbleached piece goods, but the field of competition was expanding when Great Britain went off the gold standard.

(c) Comparatively speaking the boycott appears to have been only a minor influence despite the wide publicity it received.

(d) The question of price is largely one of power to compete with cheaply produced articles of foreign origin.

British Africa, Australia and the River Plate are now about equal in their import of British piece goods, and all have suffered extreme depression. Here the chief trouble is the universal lack of purchasing power following the slump in the prices of primary products. The same is true of Egypt.

The European countries are in rather a different position. Liverpool handles a smaller proportion of this trade than certain of the southern and eastern ports; moreover, the depression is not uniform in its incidence. The decline in the Scandinavian trade, for example, is slight in comparison with that in the trade with Germany, a country suffering severe poverty.

The export of *cotton yarns* from the United Kingdom has an entirely different distribution:—

<i>Country of Destination.</i>	<i>Percentage of total exported in 3rd Quarter, 1928.</i>	<i>Percentage decline 3rd Quarter, 1928 to 3rd Quarter, 1931.</i>
Germany and Poland	33.9	52.0
British India	12.1	74.1
Netherlands	11.1	62.9
Switzerland	7.0	57.3
Belgium	4.0	62.9
U.S.A.	3.0	67.3
Rumania	3.0	36.1
Norway, Sweden and Denmark	2.7	28.4
France	2.7	53.6

It will be noted that a very large proportion of our total export in this section goes to the Continent. Owing to its location Liverpool is not in a good position to compete with the East and South Coast ports—Hull, Grimsby, Harwich, London, Dover, Folkestone and Southampton—and the limited continental services from Liverpool carry only a small portion of Lancashire's export. But for India the position is reversed and the port has lost heavily (though not so much as on piece goods) by the 74 per cent. decline in the outward yarn trade.

Effects upon the Shipping Trade.—Generally speaking it appears that Liverpool has felt the loss of trade most keenly in relation to India and other Eastern countries. This is the section in which depression has been most acute (in both piece goods and yarns) and it is also the trade in which Liverpool takes the most active part. It should be noted too, that the loss here is reflected both inwards and outwards, i.e., in the export of cotton manufactures and the import of the raw fibre. In the trade to South, West and East Africa and to Australia and the River Plate, the quantity of cotton goods carried is rather less and the decline is less drastic in its effects.

B. Woollen Goods.

Present Position of the Trade.

			Per cent.
Liverpool ...	Actual value of woollen † goods	Decline 1924-30	52·7
	Woollen and worsted yarns † (quantity).	Increase 1924-29	2·5
(U.K.) ...	Tops and yarns † (quantity).	Decline 1928 (3rd Quarter) to 1931 (3rd Quarter).	51·8
Liverpool ...	Woollen and worsted tissues † (quantity).	Decline 1924-29	29·8
(U.K.) ...	ditto †	„ 1928-31	68·2

As will be seen the figures relating to woollen goods are not particularly useful and any conclusions which can be drawn are of the broadest nature. Liverpool figures for quantity exports (value figures are inaccurate owing to the decline in prices) go only as far as 1929, when depression was only beginning. If, however, one accepts the United Kingdom figures as applicable to Liverpool, which exported some 36 per cent. of the British total in 1928, the position seems to be that woollen tissues had declined by well over half in the third quarter of 1931, the nadir of the present depression. Yarns, while rather less depressed, still show about 50 per cent. decline, but their importance is not great.

Factors affecting the Trade.—In general these, as for other commodities, are :—

(a) Decline in purchasing power abroad, in this case especially in China (also fall in value of silver), the River Plate, Canada, U.S.A. and Germany. In the third quarter of 1931 the decline from the third quarter of 1928 was as follows (U.K. figures woollen tissues) :—

	Per cent.
China	73·2
River Plate and Brazil	64·3
Canada	69·8
U.S.A.	80·1
Germany	59·2

(b) To a small extent the increase in foreign competition. This, however, is much less intense than in the case of cottons, chemicals and ironware.

Effects upon the Shipping Trade.—The loss of the woollen trade has affected most severely shipping companies trading to the Far East or the East Coast of South America, and these companies are well represented in Liverpool. Considerable loss is felt in the North Atlantic trade also. In this latter quarter there is always a scarcity of outward cargoes and many ships sail more than half empty. They depend very largely upon re-exported colonial produce, woollens and pottery, and a 70-80 per cent. decline in woollens is therefore a very serious matter. It affects both passenger liners and cargo steamers which cross the Atlantic to return with produce from the U.S.A. and Canada.

C. Iron and Steel Goods.

Present Position of the Trade.

	1913.	1924.	1926.	1928.	1929.	1930.
Value† in £ (millions) ...	19·5	23·4	18·9	21·0	20·2	15·2

Decline in value, 1924-1930=35·0 per cent.

Owing to the variety of goods included under the above head no quantity figures or price index numbers are available and the plain value figures as they stand are of only slight use. Further figures, in this case applying to the United Kingdom, give some idea of decline in particular sections of the trade.

Decline|| 3rd Quarter, 1928 to 3rd Quarter, 1931.

	Per cent.
Galvanized sheets... ..	70·9
Tinned sheets	39·4
Uncoated sheets and plates ...	68·7

Factors affecting the Trade.—Iron and steel goods have suffered considerably from the general depression but have also been affected very adversely by foreign competition particularly from Germany and Belgium. This competition has grown steadily since the War.

Effects upon the Shipping Trade.—The export of iron and steel ware is directed so generally over the world that it is difficult to say that one trade area is more affected than another. In actual total decline (i.e. not proportional decline) India, Australia and the Far East have suffered severely, but it has been reported that very heavy losses have also been experienced on the River Plate route. Owing to the large proportion of a normal cargo which consists of iron and steel goods and the very generalised export, decline in this quarter is more serious than the few figures quoted would seem to indicate.

D. Machinery.

Present position of the Trade.

Weight—Increase 1924–1929	= 18 per cent. †
Value—	" " " = 12 "
" Decrease 1924–1930	= 5 "

U.K. figures || :—

(a) Machinery (Prime Movers) :—

Value Decrease 3rd Quarter 1928	
to " " 1931	= 54.9 per cent.
" " " 1928	
to " " 1930	= 30.0 "

(b) Textile Machinery :—

Value Decrease 3rd Quarter 1928	
to " " 1931	= 54.0 per cent.
" " " 1928	
to " " 1930	= 25.5 "

The export of various types of machinery rose steadily until 1929 but then fell off with great rapidity and the degree of depression in the 3rd quarter of 1931 as compared with the same period of 1928 was apparently about 50 per cent.

Factors affecting the Trade.—Figures applying specifically to the machinery trade are scarce, but, dealing as it does in "producers' goods", it is certain to be seriously affected by the world depression.

Effects upon the Shipping Trade.—The greatest volume of machinery is consigned to India and Northern and Western Europe. Liverpool is open to loss in the first trade rather than the second as most continental stuff is handled by the southern and eastern ports of Britain.

E. Vehicles.

The term "vehicles" includes road and rail vehicles, ships and aeroplanes.

Present position of the Trade.—Increase in value 1924–1929 = 47 per cent. †

This is a very doubtful index, as the trade varies a great deal from year to year and the figure quoted is for a period before the true depression began.

Factors affecting the Trade.—Much of the export through Liverpool consists of bicycles and parts, motor cars and railway engines and rolling stock. Railway vehicles are naturally produced in accordance with the progress of railway construction abroad and do not reflect the incidence of general depression very closely. Liverpool exports railway stock in fair quantities to Argentina, India and South and East Africa, but the relative quantities fluctuate considerably with the inception of new railway construction. Bicycles

had a considerable market in India, Malaya and the East Indies and it is very probable that this export declined greatly with the decrease in purchasing power in tropical areas. Motors are consigned in greatest number to Australia, New Zealand and India and it is fairly certain that this trade also has much declined.

Effects upon the Shipping Trade.—The effect on the shipping trade will be to restrict outward cargoes of vehicles other than railway stock to India and Australia. The railway vehicle trade is carried mainly by specially built Norwegian locomotive carriers and this trade, though sporadic, will have suffered little decline.

F. Other Export Trades.

The few trades examined hitherto exhaust a little over half the normal export trade of the port. It would be useless to devote special sections to the remaining items, however, as the statistics relative to depression are not sufficiently detailed to allow anything like a reliable estimate of the position.

The chief materials concerned are chemicals, linen, tobacco, pottery and glassware, artificial silk, apparel, leather, soap, electrical goods, paper, &c. The U.K. figures published in the Royal Economic Society's "Reports on Current Economic Conditions" show the following indices of depression. The percentages indicate the degree of decline between the 3rd quarter of 1928 and the 3rd quarter of 1931 (values).

(1) Linen piece goods, 34.3 per cent. The chief decline has been in the trade to U.S.A., Brazil and Argentina, and Australia and New Zealand.

(2) Pottery, &c., 49.3 per cent. Chief decline in trade to Canada, Australia, New Zealand, U.S.A. and Argentina.

(3) Apparel, 44.4 per cent. Chief decline in trade to South Africa (from London and Southampton rather than Liverpool), New Zealand and Canada. The trade with the Irish Free State is of great importance, perhaps second to South Africa, and has suffered little or no decline. Much of this traffic passes through the port of Liverpool.

(4) Leather, boots and shoes 57.5 per cent. Chief decline in trade to U.S.A. (considerable loss to Liverpool), New Zealand, Germany, France and South Africa. The boot and shoe trade to Ireland in 1928 equalled about one-third of the total export and, as it has not declined since then, it now equals about one-half the total. Much of this also passes through Liverpool.

(5) Paper, 34.2 per cent. Chief decline in trade to Australia and New Zealand.

(vi) *The Passenger Trade.*

In 1913 some 49 per cent.¶ of Britain's outward passenger trade and 44 per cent. of the inward trade passed through Liverpool. Over half a million passengers were carried in that year and this was typical of the pre-war period.

The years immediately following the War, 1920, 1921 and 1922, showed a sudden and remarkable collapse from this high peak to a level at which the annual passenger movement was comparable with that for 1924 (194,000). The level attained by the inward movement at that date remained fairly constant until 1930. During 1931, however, there has been a further steep decline, though figures are not available. The outward trade declined by some 25 per cent. between 1924 and 1930 (see Diagram 2, p. 78). Again a sudden drop occurred in 1931. At the same time there has been a steady decrease in the proportion of the total passenger trade passing through Liverpool. The percentages are shown clearly in the accompanying graph (see Diagram 3, p. 79) and they can be summarised thus¶ :

			1913.	1924.	1929.	1930.
			<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
Inward ...	...	...	44	28·4	24·0	22·5
Outward ...	...	...	49	32·8	28·3	27·9
			—	—	—	—
Total ...	...	...	48	31·7	26·5	25·4

The decline since 1924 in the number of passengers leaving England, and similarly in the number leaving Liverpool, is due in large part to the practical cessation of the emigrant trade to U.S.A. and Canada. The inward traffic, 1924-30, has remained fairly constant as it represents mainly tourist and business movement.

A clearer picture of the position can be obtained by examining the relative depression in different sections of the passenger trade. In volume that which most concerns Liverpool is the North Atlantic trade. This is divided into two sections, the Canadian and the U.S.A. Expressed as proportions of the total passenger trade of the port they show the following percentages in the years 1924, 1929 and 1930.**

			1924.	1929.	1930.
			<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
Canada ...	...	...	52·7	48·6	47·0
U.S.A. ...	...	...	27·1	29·1	31·7

The depression in each of the years 1929 and 1930 as compared with 1924 was :—

			1929.	1930.
			<i>Per cent.</i>	<i>Per cent.</i>
Canada ...	...	...	14·6	28·0
U.S.A. ...	...	...	0·4	5·1

The United Kingdom figures for the first 9 months of 1931 show a percentage decline in the intensity of passenger movement as compared with the same period of 1924 as follows:—

<i>Inwards.</i>			<i>Outwards.</i>		
		<i>Per cent.</i>			<i>Per cent.</i>
Canada	...	6.9	Canada	...	65.6
U.S.A.	...	4.5	U.S.A.	...	21.2

It will be noted that the decline in the Canadian trade, which is the more important, is primarily in the outward trade. The inward trade, which is primarily tourist and business, has been hit less severely. Emigrants returning to England to obtain unemployment benefit after being unable to find work in the Dominions accounted for a certain inflation in 1931.

The U.S.A. trade shows slightly different characteristics. It is affected:—(a) by the transference of the normal business and tourist trade to Southampton (see Diagram 3). The relative expansion of Southampton's trade at the expense of Liverpool now seems to have ceased and there has been no recent transference of ships from the Mersey to the Channel. (b) by the depressing effects of a general economic decline upon business and pleasure movement. The decline until 1931 was much less intense than in the Canadian trade. As in the Canadian trade there is a considerable movement of emigrants who are returning to England to obtain unemployment benefit.

Passenger trade figures have also been obtained** for Australasia, South Africa and India. India shows a decline of about 40 per cent. from 1924 to 30. This trade is mainly an outward one. The inward passenger movement is mainly through London, which seems to have been progressively capturing the outward trade also and now easily outclasses Liverpool. The Australasian trade concerns London and Southampton rather than Liverpool, but Liverpool has lost a great deal since 1924 even of the traffic it had. This trade is almost entirely an outward one. In 1924, 4,501 passengers passed through the port and in 1930 only 1,298. The decrease in the South African trade is only slight (see Table, p. 77).

The passenger trade to other ports of the Empire increased between 1924 and 1930 by about 20 per cent.; but trade to foreign countries, with the exception of U.S.A., showed a decline of about 13 per cent.

The Irish cross-channel services centred on Liverpool have shown signs of some expansion in sympathy with the general tenor of Anglo-Irish trade.

<i>Percentage of Total Anglo-Irish (a) passenger trade via :—</i>	<i>1926.</i>			<i>1927 and 1928.</i>		<i>1929.</i>
			<i>Per cent.</i>		<i>Per cent.</i>	<i>Per cent.</i>
Holyhead	59	57	57	57
Fishguard	15	15	15	15
Liverpool	15	16	16	17

(a) Figures for Northern Ireland are not available.

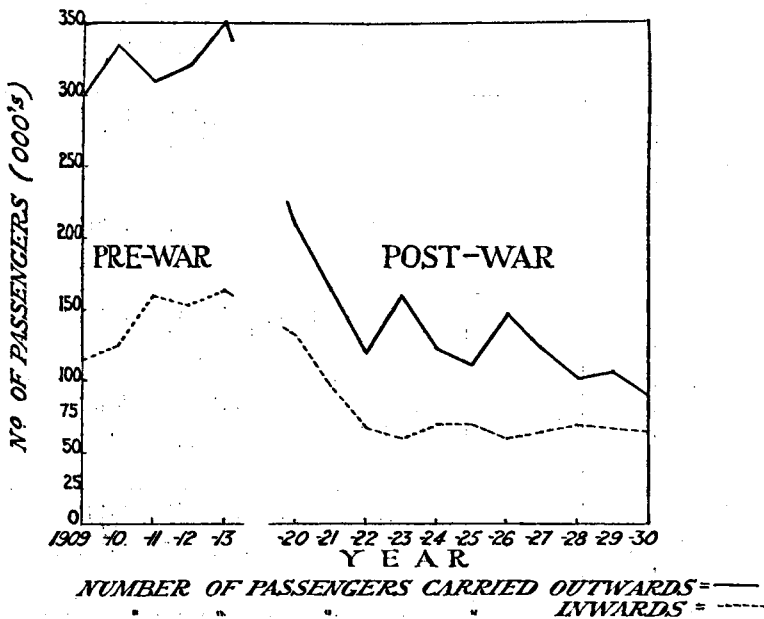
Statement ** showing the numbers of passengers (British subjects and aliens) to and from places out of Europe, distinguishing the principal countries in which they contracted to land or in which they embarked, at Liverpool, Southampton and London, in the years 1924, 1929 and 1930.

Port and Year.			Country in which the Passengers contracted to land or in which they embarked.										
			British Empire.						Foreign Countries.				
			British North America.	Australia.	New Zealand.	British South Africa.	India (including Ceylon).	Other Parts of the British Empire.	Total.	United States.	Other Foreign Countries.	Total.	Grand Total.
1924													
Liverpool	Out	...	66,702	1,962	1,905	1,756	6,440	6,369	85,134	29,046	8,021	37,067	122,201
	In	...	35,675	634	—	640	2,242	1,944	41,035	23,498	7,396	30,894	71,929
Southampton	Out	...	27,859	—	10,160	14,274	23	861	53,177	62,057	6,263	68,320	121,497
	In	...	8,073	6,629	3,151	13,378	835	738	32,804	45,790	6,556	52,346	85,150
London	Out	...	85	44,696	433	8,832	6,363	4,756	65,165	2,799	5,002	7,801	72,966
	In	...	5,324	9,356	173	8,370	7,425	5,280	35,928	5,239	5,023	10,262	46,190
1929													
Liverpool	Out	...	55,693	3,185	151	2,171	5,916	8,494	75,610	29,747	7,759	37,506	113,116
	In	...	31,750	162	—	213	2,073	2,834	37,032	22,585	6,983	29,568	66,600
Southampton	Out	...	36,990	5,498	5,241	19,845	241	1,808	69,623	72,533	8,710	81,243	150,866
	In	...	11,737	6,739	2,999	16,137	636	1,969	40,217	41,842	8,326	50,168	90,385
London	Out	...	64	18,279	255	7,588	6,423	5,701	38,310	7,143	7,348	14,491	52,801
	In	...	5,136	11,004	257	5,286	7,331	5,663	34,677	10,478	6,033	16,511	51,188
1930													
Liverpool	Out	...	41,463	1,227	35	1,505	4,669	7,893	56,792	27,680	7,021	34,701	91,493
	In	...	32,310	34	2	32	1,894	2,491	36,763	22,143	6,590	28,733	65,496
Southampton	Out	...	26,052	4,451	4,390	16,948	485	1,788	54,114	64,592	8,131	72,723	126,837
	In	...	11,122	8,184	3,220	18,489	728	2,006	43,749	40,226	8,265	48,491	92,240
London	Out	...	65	10,891	738	6,848	5,625	5,249	29,416	5,430	7,567	12,997	42,413
	In	...	6,409	12,876	322	3,517	7,549	5,726	36,399	8,807	7,308	16,115	52,514

The general opinion of persons interviewed with regard to the passenger trade seems to be that little or nothing can be done to improve conditions on Merseyside. The port suffers from remoteness from the Continent and cannot aspire to Channel or North Sea passenger services. Similarly it cannot hope to regain the transatlantic tourist and business traffic which has gone to Southampton owing to its convenience for London and the Continent.

DIAGRAM 2.

Passenger Movement between Liverpool and Countries outside Europe excepting Mediterranean Countries.



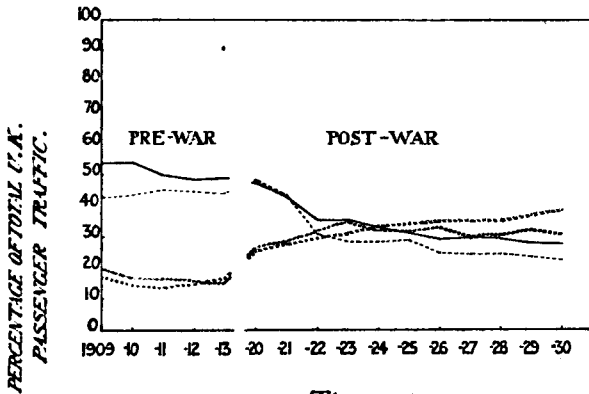
(vii) *The Regional Aspect.*

Hitherto emphasis has been laid on trade in particular commodities rather than with particular areas. Both are important and, at the risk of repetition, it will be instructive to glance at the same field very briefly from the regional aspect.

DIAGRAM 3.

Position of Liverpool and Southampton in the United Kingdom Passenger Trades.

(Passengers to and from countries outside Europe excepting Mediterranean Countries.)



Liverpool out—
in—

Southampton out—
in—

* *The numbers of passengers at each port are expressed as a percentage of total outward (or total inward) passengers from (or to) the United Kingdom.*

Northern Europe.—The inward trade from the Baltic, mainly timber, paper and wood-pulp, has been fairly constant, but recently Russia has been increasing her timber export at the expense of other Baltic countries. Outward trade has declined only moderately. Holland, Belgium, Germany and Northern France show a decrease of trade, particularly outward from Liverpool.

Spain, Portugal and Western Mediterranean.—No decline in inward fruit trade, a very important trade for Liverpool, but not carried in the main by British ships. Outward trade badly depressed, ships going out practically empty.

Eastern Mediterranean and Black Sea.—Egyptian trade greatly reduced by lack of cotton cargoes. Levant fruit trade and Black Sea grain trade, largely carried by foreign ships, still flourishing. Also Greek dried fruit trade.

West Africa.—For some years the palm kernel and palm oil trade has tended to move to the Continent and the export trade had declined owing to the reduced purchasing power of the natives until Great Britain went off the gold standard. There has also been a decided loss in transshipment traffic on account of the introduction of direct continental services and the cheapness of freights and of port charges on the Continent as compared with Liverpool.

India and Burma.—Outward trade in manufactured goods is very depressed; also severe fall in inward cargoes of cotton and other raw materials.

Far East.—Mainly an outward trade which is reduced by fall in silver, collapse in prices, political unrest and competition from Japan.

Australasia.—Outward trade reduced by lack of purchasing power; but inward trade, particularly meat, more steady.

North America.—Whole trade much damaged by serious decline in passenger traffic. Passengers form the main outward cargo; cotton and grain now coming from East Coast in only small quantities, but tobacco, metals and certain foodstuffs show less depression. Outward trade to Canada also down.

West Indies and Central America.—Fruit trade to Liverpool still prospering. Sugar trade suffers from low prices and so prevents buying of exports from this country.

Brazil, Uruguay and Argentina.—Large trade to Liverpool in grain and meat not much affected by depression. Export trade to all three much reduced by lack of purchasing power and foreign competition.

West Coast of South America.—Peru impoverished by collapse in prices of cotton and sugar; Chile by throttling of nitrate industry. Big decline in cotton imported from Peru.

Irish trade.—No signs of depression in passenger or goods traffic, both very important to Liverpool.

Coasting trade.—Probably some decline in cargoes. Chief competition is with the railways.

(viii) *Summary of Factors affecting the Shipping Industry.*

The main factors causing depression in this most important section of Merseyside industry may now be summed up under the following heads:—

- (a) Lack of purchasing power in other countries.
- (b) Economic nationalism.
- (c) Competition for trade with other countries.
- (d) Currency dislocation.
- (e) High costs in port.
- (f) High costs of distribution as compared with other countries.

The first four of these factors are inter-related. The War has not only caused impoverishment but it has altogether upset the balance of economy between nations. A demand for the payment of debts and reparations in goods, which are hindered from entering freely the countries to which they are owing, has caused currency dislocation and the sterilisation of gold in certain centres. This has intensified economic nationalism, leading to higher tariffs

and a bitter competition for trade by fair or unfair means. The power of production has been enormously multiplied but consumption is checked by complete failure to regulate exchange and distribution effectively.

The repercussions of these various factors upon Merseyside shipping will be indicated by brief notes under each head, which are to be regarded as merely illustrative of their wide reach. To provide a complete list of the ways in which the industry has been affected would be obviously impossible.

(a) *Lack of Purchasing Power.*

Manufacturers, merchants and shipowners have suffered severely, especially since 1928 or 1929, from the poverty of their foreign customers. This has been due in part to lack of confidence on account of the long continued depression, but chiefly to the slump in prices of primary products on which these countries depend for their existence. If they cannot cover their costs of production they are not in a position to buy manufactured goods and machinery from us in return.

Some idea of the extent of the decline is provided by the following wholesale price indices published by the Statist. (Average 1867-77 = 100) :—

	1924.	1929.	1930.
Wheat	96	91	66
Maize	122	112	71
Rice	167	143	130
Sugar	84	36	27
Coffee	154	140	95
Tea	110	93	88
Tin	239	198	138
Cotton	172	114	79
Jute	167	168	105
Wool	254	156	86
Silk	102	60	48
Palm Oil... ..	103	89	65
Average	147	117	83

The reasons for this sharp decline are not always easy to isolate. The trouble may be due to over-production. Of wheat, for example, as has been already mentioned, the world has to carry a large extra crop owing to the introduction of low priced, good quality, Russian grain into an already sated market, and the position is aggravated by the recent harvesting of bumper crops in many parts of the world. In cotton, the problem is rather one of adjustment of production to a declining market. In wool, it is bound up in Australia with questions of a financial character.

India and Burma, among the most important areas with which Liverpool trades, are badly affected owing to the decline in price of cotton, jute and rice. There is a similar decline in the Far East, in Australia (wool and wheat), in all sugar-producing areas, Peru and the West Indies in particular, in Brazil (coffee, sugar, maize), in West Africa (cocoa and palm kernels), Egypt (cotton), Spain (fruit). Certain parts of the Baltic, again, are impoverished because their timber trade has been captured by Russia.

(b) *Economic Nationalism.*

It is this spirit, fostered by the desire for independence and self-preservation, which is responsible for countries seeking to wall themselves in with tariffs on the one hand, and subsidising their industries on the other, so that they may be the better able to surmount the tariff walls of their rivals. An economic war between nations thus takes the place of a war with armed forces, and both lead to a serious waste of world resources. Any restriction of free commerce between nations hits the Shipping industry badly.

Tariff restrictions affect the trade between Merseyside and a wide range of foreign countries which it is not necessary to specify. But as examples of foreign subsidised trade reference might be made to the United States Shipping Board, which has undermined our hold on the North Atlantic trade; to the Canadian Government Line and the Australian Commonwealth Line (now sold), both run at a considerable loss; to Japanese ships carrying cotton goods to India; and to certain German industries which are said to obtain their raw materials through the Government at a low rate. British companies which lack official support find it difficult to meet such unequal competition, though they have no fear of losing trade on fair terms.

Under this head, too, might be noted the unsettling effect upon commerce, again with re-actions upon shipping, of political disturbances such as those in India and China, and of revolutionary changes such as have occurred in Russia.

(c) *Competition for Trade.*

The inability of Great Britain to compete with other countries in foreign markets, in so far as it exists, affects Shipping intimately. The cost of transport is itself one factor which determines price, but reference will be made to that presently.

As to the results, keen competition is experienced in the Baltic from German and Polish industries: their goods are cheaper and their market is nearer; in India and China from Japanese and Indian cotton mills; in Brazil, Argentina, Chile and Peru from Germany, Belgium, France and the United States. In South America it is said that there is a predilection for British goods but that Great Britain has only recently begun to manufacture to

suit the market. The statement that " the prices of British articles are too high " frequently signifies, not that British goods are a bad bargain, but that the buyers cannot aspire to articles of so high a grade.

(d) *Currency Dislocation.*

From 1925 until this country went off the gold standard British exporting industries, and, along with them, the Merseyside shipping industry, which is so dependent upon exports, laboured under a severe handicap in view of the foreign exchange position. All shippers and exporters consulted consequently welcomed the desertion of gold and reported a widespread recovery in the export trade as well as in the import trade in raw materials (November, 1931).

Other aspects of currency dislocation are illustrated by the decline in the value of silver which has discouraged trade with India and China; an exchange adverse to the South American republics preventing them from buying British goods; financial chaos in Australia resulting in loss of trade with that country; and a check on trade with Germany on account of a diminished confidence in the ability to pay of potential customers there.

(e) *High Costs in Port.*

How does this factor tell against Merseyside? That port dues and cargo handling costs are higher in Liverpool than elsewhere and considerably higher than on the Continent is one of the charges most frequently made by ship owners on Merseyside.

Comparative figures have been given of costs in English and in Continental ports, but it is doubtful whether comparison between services which are in many respects dissimilar have much validity.

For example, steamer carrying 3,700 tons of general cargo :—

		<i>London.</i>	<i>Antwerp.</i>
		£	£
Port Charges ...	... ..	313	112
Cargo handling ...	... ..	1,010	523
		—	—
Total ...	... ..	£1,323	£635

Certainly a difference of this magnitude, if at all general, calls for comment. But many of the Channel and North Sea ports are state or municipally owned so that competition with them is not on equal terms.

Reasons offered for the high charges in Liverpool are :—

- (i) The great cost of keeping the river bed clear of sand and silt.

(ii) The high wages paid to employees of the Dock Board and to dock labourers.

(iii) The large sums spent on the building of docks.

It is not possible altogether to escape the first of these expenses, but it might conceivably be reduced. The sum so spent in 1929-30 amounted to 9 per cent. of the total port expenditure. At present it is estimated that some 600,000 tons of solid sewage are poured into the Mersey each year from the boroughs lining its banks. This is not all carried away by the tide; it combines with the loose sand to form a semi-solid mass which cannot be removed by sand pumps. It is suggested that this adds considerably to the expenditure on dredging and that if more modern methods of sewage disposal were adopted by the boroughs, not only would they facilitate navigation but there would be a gain in a hygienic sense also.

An investigation of the wages paid to employees of the Dock Board as well as to dock workers in general did not fall strictly within this Survey. But it is pertinent to point out that, although wages may account for some difference in costs as between British and Continental ports, they cannot explain any big difference in costs as between Liverpool and other English ports since the rate of pay for ordinary dock labour is governed by a national scale.†† Associated with wages are other questions: union restrictions, overtime, the general conditions of labour and similar matters, certain aspects of which have been discussed elsewhere.

As to the third point, there is no doubt that large sums have been spent in building docks and in improving the general facilities for handling cargo—by the provision of electrical machinery, cranes, storing sheds, etc.; these were described, almost without exception, as excellent. It cannot be disputed that the level of efficiency and despatch at the Merseyside docks is very high, and, if this level is to be maintained, the dues must be correspondingly high.

It was generally held that the shipowner who desires first-class port services, and is prepared to pay in proportion to what he gets, will find Liverpool suits his requirements admirably, but the tramp owner carrying rough, low value cargoes, content with more primitive services, may find Liverpool "too good" a port. Efforts are now being made, however, by the Board to provide special accommodation for low value cargo. Another suggestion worth considering is that "lighter" services might be instituted as on the Thames to meet the requirements of the rougher type of trade.

(f) *High Costs of Distribution as compared with other Countries.*

Merchants frequently mentioned that British competitive power was considerably weakened by the handicap of high rail rates to the ports, high costs of cargo handling in the ports (with special

reference, of course, to Liverpool), and high freights from Britain as compared with corresponding freights from the Continent. Owing to this differentiation, they said, British industry laboured under serious disadvantage.

Reference will be made to railway rates under the heading of Transport in a subsequent section of this Report. Port dues and the cost of handling cargo in the port have already been discussed. It is possible, therefore, to proceed at once to the subject of shipping freights.

That freights from Liverpool were uneconomically high was emphatically denied by all shipowners consulted, and many merchants considered that shipping freights had been reduced as much as could be expected. Several went so far as to say that the owners had been entirely sympathetic towards requests for cheaper transport, and, where they could, had given considerable help to the exporting industry.

The contention of the owners was that freights were now at a level over 20 per cent. below pre-war, whereas costs—fuel, wages, repairs, renewals, insurance, etc.—were on an average 60 per cent. above pre-war levels. In their view a further reduction in freights was therefore quite impossible. Ships were now running with 50 per cent. of their cargo space empty, and most Liverpool Companies had to stand a direct loss on every ship they sent out. This report was received before Great Britain went off the gold standard.

Of the items mentioned under costs, wages was certainly the most stressed. As an example of the comparative costs of labour on ships of different nationalities the following figures were quoted:—British £9; Dutch £8 4s.; Italian £5 18s. 6d.; German £5 10s.; French £4 6s. This represented the monthly wage for one grade of labour only, but the same disparity was said to appear in all ranks. Some Companies were trying to reduce costs by substituting Asiatic for British labour wherever possible. Other employers professed themselves more anxious to get a less rigid application of Trade Union regulations than to reduce wages.

Board of Trade regulations also came in for some criticism, but those relating to safety called for comment chiefly by their absence or evasion abroad, a factor which reduced competitive expenses on foreign ships. But it was generally contended that ocean freights comprised only a minute proportion of the normal costs of producing and marketing an article, and therefore even a considerable disparity in freights as compared with the Continent would not appear in retail prices. Various examples were quoted for the year 1924, and it appeared that the position had not changed since. Generally speaking, it was said, the total expenses of loading,

carriage (freight) and port charges comprised 2.7 per cent. of the value of the article concerned; freight alone comprised only 1.4 per cent. Detailed examples given were as follows:—

Freights expressed as percentage of total value of article.

<i>Article.</i>	<i>Minimum.</i>	<i>Maximum.</i>
	per cent.	per cent.
Cotton piece goods	1.0	3.0
Woollen piece goods	0.9	4.5
Linens	1.7	2.1
Tinplates	7.1	12.5
Motor Cars	2.6	8.4
Boots and Shoes	2.0	2.8
Cutlery, hardware and tools ...	1.1	9.2

The statement that freights did not affect retail prices was also supported by some of the merchants with whom interviews were obtained. None the less it seems quite possible that the combination of the three elements mentioned—railway rates, port charges and cargo handling costs, and ocean freights—may in conjunction have appreciable effect in increasing the price of British goods abroad.

Liverpool has lost some transshipment traffic as a result of the modern tendency of shippers and buyers to save expense by direct delivery. For instance, there are now direct services from West Africa to the United Kingdom, North Continent, North France, Mediterranean ports and the United States. Practically the whole of the Mediterranean trade moves by the direct route. Cheaper continental port dues, labour costs and freights are also responsible for the gradual loss of the transshipment trade. As an example of cheaper freights from the Continent, the cost of carrying cotton from Hamburg to Barcelona was quoted as 20s. a ton, whereas from Liverpool it was 30s. a ton.

Attention was drawn also to the fact that competition with Japan and U.S.A. in the East was hampered by the exorbitant dues levied by the Suez Canal Company. Japanese ships trading to India were not subject to this extra expense; and American ships trading to India, the East Indies, China and Japan could use the Panama Canal, which charged appreciably lower rates. Latterly indeed some British owners had seriously considered the re-adoption of the Cape route to the East. But a satisfactory reduction in dues had now been obtained (10 per cent.), although this has been more than offset by the decline in value of the pound. It was stated that a company previously paying £400,000 per annum in dues would now have to pay £432,000 per annum, despite the 10 per cent. reduction.

All these forces have combined to reduce shipping, the pride of Merseyside, to a very low state, which only an awakening of new and vigorous life in our international trade can redeem.

Shipbuilding and Repairing.

Merseyside, until recently a centre of large and important shipbuilding and repairing yards, has been severely affected by the depression in the shipping industry compelling companies to lay up their ships. It has also been affected in some degree by curtailment of the naval programme and cessation of the Government subsidy to companies for liner construction.

In addition to these major factors, the order given by U.S.A. companies to their ships' officers that only very necessary repairs are to be undertaken while abroad means some loss to British firms. It is perhaps pertinent to mention also that some British ships have repair work done on the Continent owing to the lower rates prevailing.

The Merseyside yards are therefore practically idle except for purely essential repair work, and in consequence of this difficulty has been experienced in getting a picture of conditions in the industry from the firms concerned.

The employment figures as well as the information obtained by special enquiry in Barrow indicate that conditions there, in this and the related industry of Iron and Steel, have been distinctly better than in the rest of Merseyside (See Part II, § VI). The impression given by the reports received is that this is due largely to the fact that Barrow has specialized in highly skilled work and has taken advantage of the depression greatly to improve its plant and general equipment.

Casual Labour at the Docks.

This part of our Report would be incomplete if it made no reference to the ever present problem of casual labour at the docks. It seemed unnecessary to make any detailed investigation of this subject since so recently as 1929, by the public spirited action of the then Lord Mayor of Liverpool, Mr. Lawrence Holt, a special enquiry was made and a very able report written upon it by Mr. F. G. Hanham, one of the officials of the North Western Divisional Office of the Ministry of Labour. It will therefore suffice to draw attention to one or two of the main conclusions which resulted from that enquiry and to refer readers to the report itself for the full details. Some figures relating to 1930 and 1931, kindly supplied by the Accountant Manager of the Liverpool Docks Scheme, with the approval of the Dock Labour Joint Committee, are also included for comparison.

Nearly twenty years ago a scheme was introduced to promote decasualisation of labour at the Liverpool docks. It was to be administered by a Government Department in co-operation with a Joint Committee of Employers' and Trade Union Representatives and its alleged purpose was to restrict the supply of dock labour :—

- (1) To a number sufficient to meet the necessary fluctuation in the work ;
- (2) To those persons who may be said to follow genuinely the trade of dock labouring.

The methods adopted to attain these ends were as follows :—

- (1) Genuine dock labourers were to be registered and provided with tallies ;
- (2) Employment was to be limited to these tallyholders ;
- (3) Wages were to be paid centrally instead of by individual employers ;
- (4) Insurance books also were to be stamped centrally ;
- (5) Surplus stands were to be set up to facilitate the mobility of labour.

What has been the total outcome of these carefully planned efforts? First, let us consider the average number of tallies in circulation. This is probably a more reliable index of the current position than the number of tallies issued, because a docker may get employment outside the scheme. In that event he has to deposit his tally until he returns to work at the docks, and that he may never do. The number of tallies in circulation given by Mr. Hanham are 21,796 for 1913 and 20,041 for 1929, a reduction of only 8 per cent. in 16 years.* The average had further fallen to 19,904 for 1930, and to 19,363 for the first three quarters of 1931, so that the total reduction was 11 per cent. at the latter date as compared with 1913.

The question may well be asked—Why has there been no greater decline over so many years in the number of registered tallyholders who are presumably available for work at the docks? It may be suggested that possibly the demand for labour has increased. But that certainly cannot be the explanation. Not only has trade been depressed but improvements in the methods of transportation and handling of cargoes at the quayside have diminished the need for labour. In proof of this it is stated that the average number of tallyholders who were paid wages was 85 per cent. of the average number of tallies in circulation in 1913, whereas the percentage had fallen to 70 per cent. in 1929.† It dropped still lower, to 66 per cent., with the depression in 1930 and to 57 per cent. in the first three quarters of 1931, though there has been a slight improvement since. As a matter of fact the demand for labour has probably decreased more than is indicated by these figures because, as Mr. Hanham points out, they take no account of the amount paid in wages. It is known that the proportion of workers receiving wages equivalent to more than five days' work per week at standard rates had diminished, while the proportion receiving wages equivalent to three days' work or less per week had increased in the interval from 1923 to 1929.‡

It is further argued that, notwithstanding the tendency for the total number of men employed per week to fall, there is less mobility of labour than there used to be, which is contrary to one of the main objects of the scheme. This contention is supported by the fact that the percentage of men who worked for more than one employer fell from 23 per cent. in 1923 to 17 per cent. in 1929.§ It has since fallen to 15 per cent. in 1930 and 14 per cent. in 1931 (46 weeks only). This of course would be a good thing if all who worked for a single employer obtained regular work, but that is not the case.

Although conditions have evidently not improved, but rather the reverse, since 1913 it may be thought that perhaps they are not really so bad as they have been painted. That there is little foundation for any such belief is shown convincingly by Mr. Hanham's figures. If in round numbers we take 20,000 to be the number of tallies in circulation in 1929, and allow 10 per cent. as a generous margin for absenteeism due to sickness, slackness, &c., we obtain 18,000 dockers as the number seeking work in any particular week; while the maximum demand for labour on any one day during a particular month when a careful count was taken did not exceed 11,000.¶ This indicates that in 1929 even on the very busiest days something like one-third of all the registered tallyholders could not hope to be employed.

The impression obtained from a study of Mr. Hanham's Report is that no real and sustained effort has been made to cope with the problem of casual labour. It is a matter which those who are actively engaged in the riverside industries, as masters and men, could settle for themselves. They, with their long experience of such conditions, ought to be better able than anyone else to think out a scheme for their improvement, and it was encouraging to find that some of them had in mind new methods of attack which were distinctly hopeful.

Even the outsider can conceive of means being devised to encourage employers to maintain a small staff of regular workers with a weekly wage guaranteed beforehand. Difficulties have arisen over the guaranteed wage in the past because it has required employers to commit themselves to fixed charges over long periods of time when conditions might change considerably. Therefore it is suggested that the precise terms need only hold for three months at a time, and, at the end of each quarterly period, it could come up for review. The number of workers for whom a wage is to be guaranteed by any firm in the first instance might bear some defined ratio to the number of man-weeks of employment given by that firm during the previous two or three years. In addition to this nucleus of regular workers each employer might have a rather larger fringe of second preference men whom he would undertake to summon from a specified central stand when required, the understanding to be that the employer should only have the first call on those men up to a certain early hour of the morning. If not taken on by that hour the men would be free to accept work from any other employer.

There would thus be a second registration scheme within that which already exists. Certain men would be registered as the first preferences of certain employers, and they would be guaranteed a definite weekly wage for 3 months at a time, additional pay to be given if the hours of work exceeded a prescribed minimum. Other men would be registered as second preferences of particular employers who would undertake to call upon them before engaging

anybody else. Up to a certain time of the day these men would not be free to accept work from any other employer, but after that time the masters would have to take their chance of getting labour in the open market in competition with others and the men would be able to take any job that was offered. An essential part of the machinery for this purpose would be a limited number of central stands in telephonic communication with each other and each employer could be required to engage his labour from one particular stand at which his second preference men would wait. The men on their part would also be required to attend only at one particular stand; they would not need to rush from one stand to another. If not required by their own employer they would either be taken on by some other employer using the same stand, or by a neighbouring employer who had communicated his needs to that stand, the general principle being that each firm should engage as many free men (in addition to second preference men) as were available at the nearest stand, and should only get men from stands further away if the nearer source were exhausted.

Furthermore, the machinery of unemployment insurance could be used to promote greater regularity of employment by charging employers with higher contributions if they employed different men each day and with lower contributions if they employed the same men every day of the week. For example: the employer's contribution might be 6d. for any part of a day's continuous employment given to any man, 7d. for more than one but not more than two days' continuous employment, and so on proportionately to 10d. for more than four but not more than seven days' continuous employment. Thus if an employer engaged one man to work for a whole week, he would be liable for an insurance contribution of 10d. as at present; if he engaged one man to work for two days and another to work for three days, his contribution would rise to 1s. 3d.; if he engaged five different men to work each for one day, his contribution would be 2s. 6d.

But it is necessary to point out that, although such devices might help to diminish casual labour, the older methods have only failed because they have never been fairly tried. First, and most important, if, as old tallyholders retired or took up other work, new tallies were not granted too freely, it is reasonable to suppose that the supply of labour could within a comparatively short period of time be suitably adjusted to the demand. Second, telephonic communication between employers and stands, if properly planned, should enable dock workers to learn where labour was required; it is conducive neither to good temper nor to good work that men should be kept for hours waiting to be employed when there is no chance at all of any employment being offered to them. Surplus stands were indeed set up as part of the original Docks Scheme, but were discontinued after a few years, as they were little used either by employers or men.

The great initiative and ability which Merseyside ship-owners have shown in the past, and the patience and grit which are so characteristic of the docker, convince one that these problems are not incapable of solution, and it is gratifying to know that the enquiry initiated by Mr. Lawrence Holt has done something to rouse public opinion once again to their gravity. The Joint Committee are this year experimenting with two central stands at the north end of the docks, but it is too soon yet to judge of their success; moreover, industrial conditions have not been such as to test them effectively.

It deserves to be added that one unqualified gain has been achieved through the original scheme by the centralised payment of wages. From ten to fifteen thousand dockers every week are thus enabled to draw their earnings on Saturday as a single payment, instead of being obliged to tramp from one employer to another as on the old plan with the great waste of time which that used to entail.

B. Distribution, Transport and General Services.

Before discussing industries which are productive or closely associated with production it will be convenient to consider groups II. and VIII., both of which are somewhat miscellaneous in character. The first group is chiefly concerned with transport and distribution, and the second with public utility services, and personal and professional services of various kinds.

Distribution.

(i) Employment.

Attention has been drawn already to the extraordinary increase in the numbers engaged in wholesale and retail distribution. The figures had grown by half as much again in the short space of six years, so that by 1930 this industry found employment for 75,500 persons, or nearly four times as many as were engaged in any other single industry in the area. But here what is true of Merseyside is true also of Great Britain, only in a less degree because, presumably, there is a greater variety of occupations on offer elsewhere. We are indeed tending to become more and more "a nation of shopkeepers," which is not altogether a healthy sign.

Until 1930 the percentage of unemployment experienced in this industry for males and females combined, never rose higher than 10 per cent., and the unemployment index is therefore very low compared to the normal for all workers. At the same time, as is natural, we find a high influx of adult males and a marked though not quite so high an influx of adult females. These indices are higher than in any except the electrical and rubber industries each of which experienced new development in the area.

The numbers of boys and girls recruited have also been above the average for all industries, but the index for girls is not much above the average. In spite of the sharp upward trend in unemployment since 1929, the number of males seeking employment in distribution has risen steadily since 1928 and the number of females has risen since 1927. This may be explained by the very general character of the depression which began in 1930, all industries being affected but distribution being one of the least affected. The proportion of men engaged in distribution has slightly increased relative to the proportions of women and young people (see graph, p. 101).

The answers to the questionnaires and the comments of business men interviewed corroborate the evidence of these employment figures. The industry, it is clear, grew very considerably between 1924 and 1930, and has not suffered from the present world depression to anything like the extent to which many other industries have suffered. The increase in employment, however, was not equally noticeable in all branches of distribution; among drapers and in general stores it was more evident than among food and provision sellers. It seems probable, too, that a not inconsiderable part of the increase is accounted for by a development in the practice of employing casual and seasonal workers. Most large shops take on extra and temporary assistants at sale times and before Christmas, and some do so as a regular practice on Saturdays.

TABLE 5 (II).

Incidence of Unemployment in Different Industries and their Relative Attraction for Labour.

Industry.	Numbers Insured in 1930.				Unemployment Index. (Mean 1923-1930.)		Index of Industrial Attraction. (Numbers Insured in 1930 relative to 1924.)			
	Men.	Boys.	Women.	Girls.	Males.	Females.	Men.	Boys.	Women.	Girls.
Distribution	45,930	6,610	30,100	5,010	61	74	155	117	129	106
Transport, Storage ; Commerce, Finance.	6,150	410	1,650	240	109	67	64	58	60	133
Other Road Transport	6,780	240	160	10	138	—	84	81	—	—
Railways	4,230	400	200	20	53	54	64	92	86	—

TABLE 6 (II).

Percentages employed in Each Industry by Sex and Age, 1924 and 1930.

Industry.	Numbers Employed in 1930.				Year.	Percentages Employed.			
	Men.	Boys.	Women.	Girls.		Men.	Boys.	Women.	Girls.
Distribution	38,050	5,840	26,960	4,670	1924	46	9	38	7
					1930	50	8	36	6
Transport, Storage ; Commerce, Finance.	4,470	380	1,510	210	1924	68	7	24	1
					1930	68	6	23	3
Other Road Transport	4,320	220	150	10	1924	94	4	2	0
					1930	92	5	3	0
Railways	3,740	390	180	20	1924	90	6	3	0
					1930	86	9	4	0

(ii) Prices and Markets.

The retail trade of Liverpool is particularly competitive, especially among drapery and general stores where the number of shops is large. It was, indeed, said that Liverpool's drapery stores are big enough to serve twice the present population, but only one firm went so far as to say definitely that there are too many drapers in the city. This rivalry is reflected in the demand for a better trained staff and in the provision of increasingly elaborate service. Many large stores now provide their customers with a restaurant, a hairdressing and beauty culture department, or a lending library, while some even encourage the sale of furniture by the addition of free insurance schemes. Competition is not, however, confined to large stores; a striking feature of recent years is the establishment of small but more or less lucrative dress shops.

The shops of Liverpool, moreover, cater for a growing market. The development of road transport and the extensive issue by the Railway Companies of cheap day tickets attract customers from all Merseyside, the Wirral, and North Wales; this centralisation means, of course, a loss to the smaller shopping centres. Birkenhead firms in particular suffer. The further development of road transport and the completion of the Mersey tunnel will undoubtedly strengthen the tendency towards centralisation.

This keen competition among retailers has continued for some years and it has been authoritatively stated that prices generally are considerably lower in the Liverpool area than in other industrial centres. Another factor keeping down prices in the food trades is the Corporation market, with its price list published each week. These two influences are of long standing, but the more recent slump has had a further depressing effect on prices and sales. While, comparatively, the retail stores seem to have been little affected by the slump, there is no doubt that they have experienced a certain decline in sales, especially in the last 12 months. Drapers, cafés and wireless traders are among those who have not suffered seriously, but provision stores have felt the depression more keenly. At the same time the fall in retail prices has certainly affected most trades, although it was alleged that retailers had not passed on to the public the benefit of the drop in the wholesale price level. In times of general poverty, too, it is said that people transfer their custom to the cheapest stores, and that therefore these actually increase their business at the expense of the rest.

No detailed evidence has been obtained which shows whether the percentage fall in sales has been greater or less than the percentage fall in prices, but rough figures from one exceptionally experienced source indicate a much greater relative fall in sales. Many retailers of food, too, have experienced a very distinct fall in consumption. This is especially so in the case of meat; manual workers considerably diminish their purchases of meat when out of work: indeed

it was stated that many people regard the cinema as a more urgent necessity than adequate food and will go hungry in order to have money for entertainment.

Another noticeable feature of retail trade to-day, which began before the slump, is the preference of the public for cheap low-quality goods. People, it is said, "buy for cheapness rather than for quality." In present day conditions this often means buying foreign rather than British-made goods. One firm maintained that a low quality article is often quite as good as the consumer needs; for example, while it would probably pay a mechanic to buy an English screw-driver for 1s. 6d., a 6d. German screw-driver is perfectly adequate for the ordinary householder. While no firm suggested that the British manufacturer should devote himself to the production of cheaper low quality goods, several recommended that the public should be "educated" to demand a higher standard. A representative of one large store, however, remarked that in his experience the British product in such lines as fancy goods and toys is too frequently inferior in quality while no cheaper than the foreign article.

There seemed to be no particular desire among distributors for tariffs, though one large distributor who favoured very strongly an immediate tariff gave as his chief reason the possibility of dumping exports abroad if the home market were protected. He added that colonial manufacturers were pleased to supply him, as a distributor, below cost of manufacture.

(iii) *Rings and "Cutting"*.

Several retailers complained of the activities of producers' rings which had the effect of keeping prices artificially high. The case of radio apparatus is one in which the problem of rings is very clearly associated with another problem—that of price-cutting. There is no doubt that in the sale of radio apparatus "cutting" is very extensive indeed. It is carried on by "cutting-shops" who buy up bankrupt stocks, or through a middleman from the manufacturer himself on the pretence of buying for export. Incidentally, it is worth while noting that the export price of most articles of this type appears to be appreciably lower than the internal price. Naturally the "legitimate" trader, who has entered into an agreement with the manufacturer to sell at a fixed price, is aggrieved since the cut price may often be as low as half the fixed price. The extent of this practice indicates, first, that the home consumer is charged a high price in order to allow of a low export price and, second, that the customer of a "legitimate" trader has to pay enough to allow the manufacturer his profit in spite of the "cutting" shops. The ordinary consumer must, therefore, pay the loss on both exports and cut prices, and could only be induced to do so by some organisation able to impose a monopoly price. Similar exception was taken to the high prices which manufacturers asked for "Proprietary Articles".

(iv) The Supply of Labour.

The majority of firms expressed themselves satisfied both with the quality of labour and with present day wages, but several were dissatisfied with the efficiency of certain grades of worker. It was suggested, in particular, that means should be devised to attract suitable persons for executive positions from the Universities. One of the largest stores in Liverpool has consistently pursued a policy of engaging young men and women from the Universities with apparently satisfactory results. Good young salesmen, especially for outdoor work, were said by another firm to be rare and they have been obliged to adopt a training scheme of their own.

The general demand on the part of consumers for home delivery of goods—especially of milk in the early morning—is in great part responsible for the problem of “blind alley” occupations for boys of 14 to 16. Any other system of delivery than that of employing boys would, it is stated, add considerably to costs, and there is no possibility of absorbing all the boys in other departments at the age of 16.

(v) Rationalisation.

Liverpool has experienced in an exceptional degree the rapidly increasing power of the big shop. Most of these big shops have, however, grown up independently from humbler origins; few have developed by a process of amalgamation with other going concerns. The big stores, while highly competitive with each other, have inevitably crushed many smaller traders out of existence, and most small shops have a very precarious hold on their own markets. Yet, while small firms complain of the advantages which size gives to their larger rivals, few see any benefit to themselves in amalgamation.

There seems to be no doubt that improvements in technique and in organisation have been making, and will continue to make, rapid strides. It appears certain, too, that these forms of rationalisation are responsible for a certain displacement of labour.

(vi) Rents, Rates and Taxes.

The burden of rents, rates and taxes evidently bears heavily on most traders, though few complained of them in more than very general terms and not more than two or three regarded the burden as overwhelming. But dissatisfaction exists with regard to the methods of assessing property in the centre of the town for rates. It was stated that the rates had been unjustifiably increased within recent years in the chief shopping areas.

The motor car horse-power tax seems to have repercussions, unfavourable to dealers, on the second-hand car market; it was

stated that owing to the tax the second-hand prices of expensive cars were unduly low. The Post Office, too, was criticised for its regulation that $\frac{1}{2}$ d. packets posted after 4.30 p.m. could not be sorted until the following day. This means that invoices frequently arrive an inconveniently long time after the goods to which they refer. These are not matters of great importance but their multiplication helps to clog the wheels of commerce.

(vii) *Hire Purchase System.*

The hire purchase system has developed extensively in the area; furniture, motor cars and the more expensive radio sets are among the chief articles sold by this method. Most of the firms engaging in hire purchase find it profitable and claim by means of it a large increase in sales. One carpet firm, however, disliked the system because the second-hand market for its wares was so poor that it was difficult to realise anything for them when customers failed to complete their payments. The system is criticised chiefly by those who do not practise it. A firm of general merchants attributed the decline in its own business in part to the earmarking of a proportion of its customers' earnings for the payment of instalments.

(viii) *Coupon Selling.*

There was general agreement that coupon selling was harmful to trade and an unfair method of competition.

(ix) *Manufacture on Merseyside.*

Distributors were asked if they knew of any commodities sold by them which might be, but are not at present, manufactured on Merseyside. It is generally recognised that a great deal might be done to attract industries to the area, and some hold that there is little likelihood of employment increasing at all considerably unless manufacturers set up new factories here. In the past there has evidently been little concern for this type of development, but in recent years the Liverpool Organization has been doing effective propaganda work with that in view. Among the few concrete suggestions made of industries which might well be established were furniture, women's clothing, footwear, hats, hosiery and cheap writing paper. It is thought too, that Liverpool would be especially suitable as an assembling centre for American cars.

If manufacturing industries are to be attracted to Merseyside, it is important that distributors in the area should lend them what assistance they can. Complaints were received—especially in the ready-made men's clothing and hosiery trades—that local distributors will not buy products manufactured locally. The case of

hosiery is particularly significant, since several distributors suggested it as a suitable manufacture for the area, and one important store apparently did not know that three hosiery factories already exist on Merseyside. Naturally distributors in many cases, probably quite rightly, prefer to buy articles such as lace, gloves, hats and pottery from the traditional centres of these industries, but there is little doubt that commercial conservatism still prevents the proper exercise of initiative and intelligent preference and it might be well worth while if means could be found for making local manufacturers and distributors better acquainted with each other.

Transport.

(i) *Employment.*

Commerce and Finance, Transport and Storage.—This is a mixed group, employing in 1930 about 4,900 males and 1,700 females. Although unemployment among women during the years 1923 to 1930 was distinctly below, and among males it was not much above, the average, yet the numbers recorded as insured in these industries fell considerably and, as the graph shows, consistently between 1924 and 1930 (see p. 102). Where this happens it may be presumed that the employers concerned have been, so far as possible, pursuing the policy of cutting down their staffs by refraining from filling vacancies as they occurred in preference to dismissing workers. It would seem that the same policy has been pursued on the *Railways*, where also both the indices of unemployment and industrial mobility are low. In *Other Road Transport* on the contrary, the incidence of unemployment has been heavy and there has been a definite movement out of this industry into others. In none of these industries is there much evidence of displacement of one class of labour by another, except that the proportion of adult males employed on Railways was slightly less in 1930 than in 1924.

(ii) *The Railway System.*

Except for the obvious limitations imposed by the coast line and the shores of the Mersey estuary, the railway system of South West Lancashire and the Wirral peninsula is little affected by the physical conformation of the land. Over the flat plains, the lines reach their destinations in most cases as directly as possible. The principal railway companies in the area are the L.M.S. and the Cheshire Lines (under the joint control of the London Midland and Scottish Railway and London and North Eastern Railway). The principal L.M.S. lines run through Preston to the north, to Manchester, and, over the Mersey at Runcorn, to Crewe and the

south. The Cheshire Lines run by way of Warrington to Manchester and into industrial Yorkshire; while, on the other side of the river, the L.M.S. and Great Western Joint line starts from Birkenhead and goes through Chester to Wales, the Midlands and the south (see p. 100).

There are two electrified suburban lines, to Southport and Ormskirk; also the electrified Mersey Railway, running under the estuary, connects the two shores of the Mersey. The urban areas of South West Lancashire are well linked together and have, on the whole, good long-distance connections. The suburban system around Liverpool, however, must have been inconveniently deficient before the days of motor transport. From the centre of Liverpool three lines radiate outwards and two of them each divide into two within the urban area. In addition there are two circumferential lines, so placed, however, as to be of little use for cross-town suburban traffic. They are nevertheless valuable as by-passes connecting the main lines to Warrington and London with the line to Southport.

In the Wirral peninsula there are three lines. Besides the L.M.S. and G.W.R. line to Cheshire, the old Wirral Railway, now L.M.S., follows the north-western coast and the shores of the Dee, while a branch of the L.N.E.R. runs diagonally across the peninsula from Wrexham to Birkenhead.

(iii) *Railway Traffic.*

Figures have been kindly supplied by the Railway Companies (Table B) showing the total tonnage of goods dealt with by them at Liverpool, Garston and Birkenhead stations. It will be seen that, while in the post-war years there has been a fall in the tonnage carried by rail, the decline of the railways has been by no means so steady or so unrelieved as those who concentrate upon dividends and share values alone might be led to expect. (See Diagram 4.) During the years 1924-29 there was a decline in tonnage of 9.4 per cent., most of which—since the total trade of the area was probably increasing—may be ascribed to road competition. Moreover, there was actually an increase in tonnage between 1928 and 1929 when certain rates, and notably cotton freight rates, were substantially reduced.

Well over half the tonnage carried by rail consists of coal, though coal would of course account for a great deal less than half the total railway receipts. If we look at the figures for 1924-29 only, before the present depression had gone far, we can see that of the total fall in tonnage of 1,270,000 tons, the fall in coal tonnage was responsible for 840,000 tons, or two-thirds. The decline in coal

traffic can be ascribed mainly to the fall in production, and, especially, in exports. No part of it, in any case, can be put down to the competition of road transport. In the "Goods and Minerals" category, road competition is no doubt of the greatest importance, but until 1929 the volume of this traffic only fell by 6.7 per cent. The railways have in fact carried a diminishing share of the total transport of the country and a slightly diminished absolute volume of traffic. The competition of road transport has been no doubt a prime factor but it is probable that the decline in the production and export of heavy goods has been of even greater importance.

TABLE B.

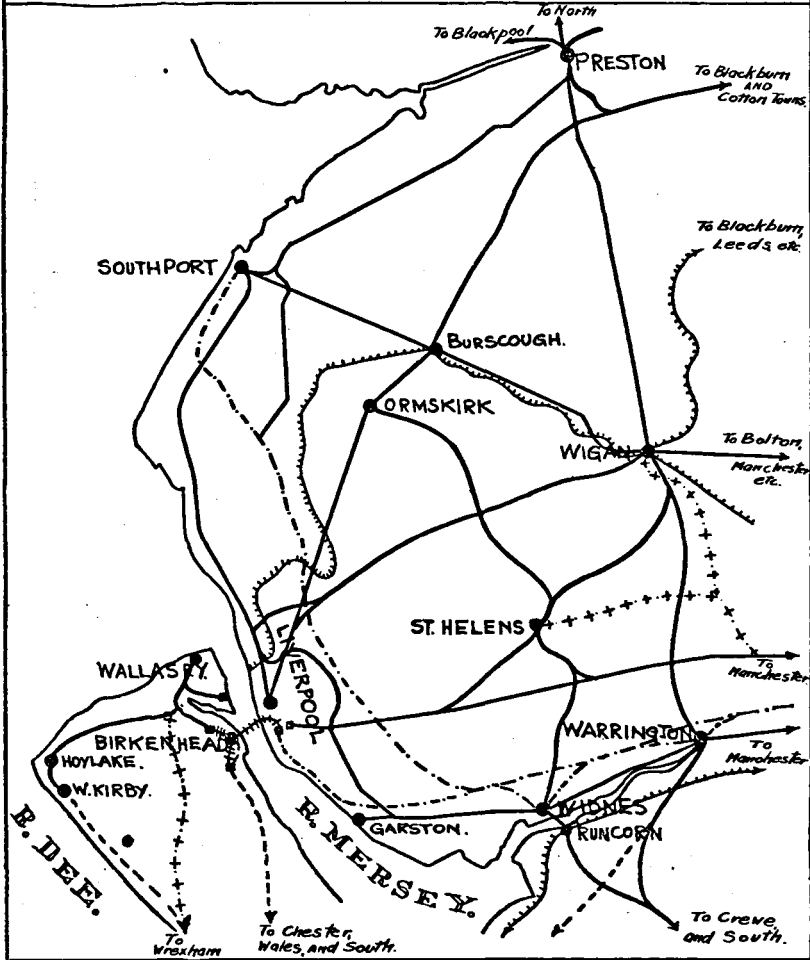
TONNAGE OF RAIL TRAFFIC TO AND FROM MERSEYSIDE 1924-1930.

Coal, Minerals and Goods dealt with by Railway Companies at Liverpool, Garston, and Birkenhead stations. (Cheshire Lines Committee, G.W.R., L.N.E.R., L.M.S.R.)

Year.	Goods and Minerals.	Coal.	Total.	Index of Total Tonnage (1924 = 100).
	Tons.	Tons.	Tons.	
1924	6,446,700	7,054,700	13,501,400	100
1925	6,499,400	6,711,000	13,210,400	98
1926	5,891,900	4,757,600	10,649,500	79
1927	6,272,500	6,378,200	12,650,700	94
1928	6,016,900	6,189,000	12,205,900	90
1929	6,017,100	6,215,400	12,232,500	91
1930	5,414,400	6,109,600	11,524,000	85

One of the principal commodities included among "Goods and Minerals" is raw cotton, of which something like 400,000 tons was in 1930 imported into Liverpool. The railways have made strenuous efforts to retain the traffic in cotton from Liverpool to the spinning areas; twice in 1928 the rates were severely cut, so that the average receipts per ton (as given in the Railway Returns) of cotton conveyed by the L.M.S. Railway fell between 1927 and 1928 from 15s. 8d. to 8s. 10d.* The low rate has, it appears, effectively cut out the road hauliers, but most mills have their own lorries, and when, as sometimes happens, cotton is urgently required, they will carry it themselves from the port.

RAIL AND CANAL TRANSPORT ON MERSEYSIDE.



RAILWAYS.

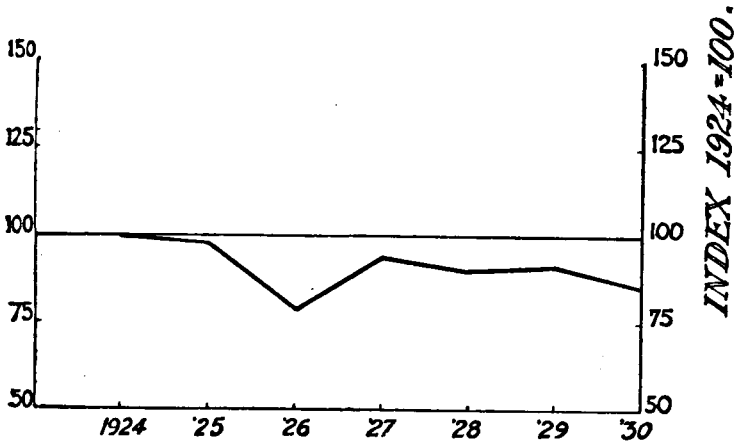
- L.M.S.R.
- - - - - Cheshire Lines.
- + + + + + L.N.E.R.
- - - - - G.W.R. & L.M.S.R. Joint.
- + + + + + Mersey Railway

CANALS.



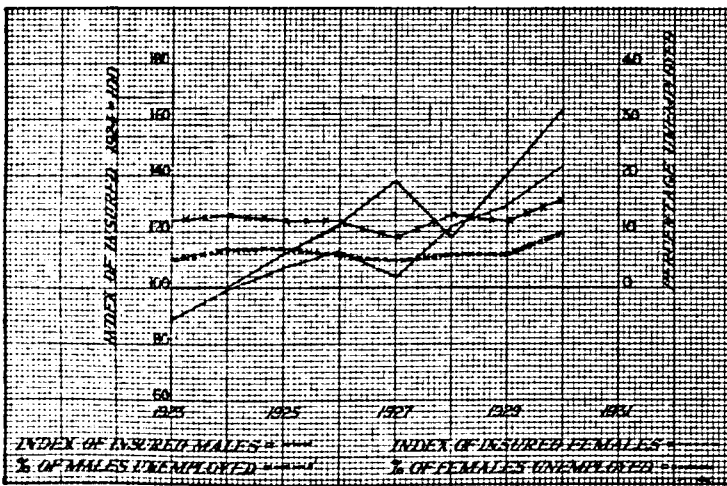
DIAGRAM 4.

Index of Tonnage of Coal, Minerals, and Goods dealt with at Liverpool, Garston and Birkenhead by Railway Companies (C.L.C.; G.W.R.; L.N.E.R. and L.M.S.R.) 1924-1930.



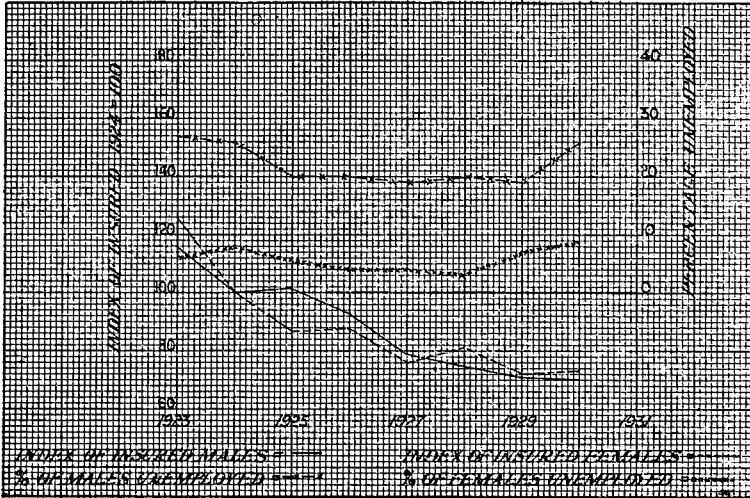
Distributive Services.

Index of insured persons and percentage unemployed 1923-30.



Transport, Communication, Storage, Commerce and Finance.

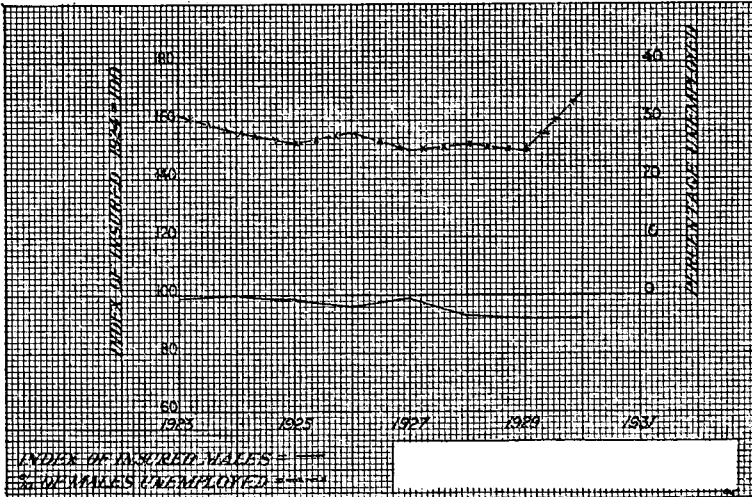
Index of insured persons and percentage unemployed 1923-30.



Other Road Transport.

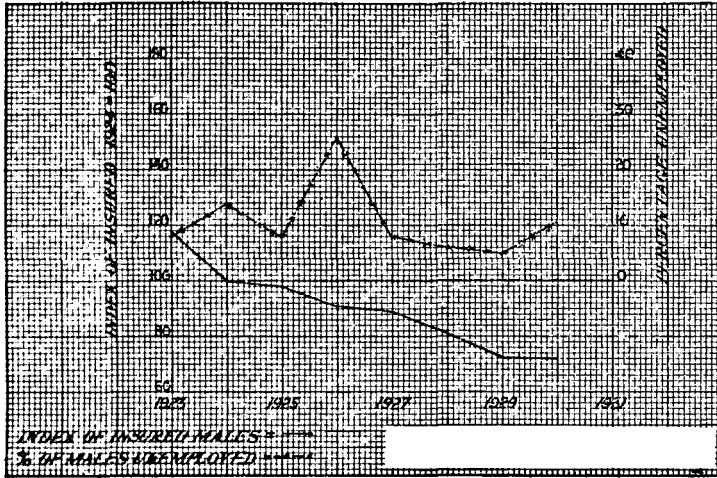
Index of insured persons and percentage unemployed 1923-30.

Males only.



Railways.

Index of insured persons and percentage unemployed 1923-30.
Males only.

*(iv) The Road System.*

The road system of Merseyside and of the region surrounding it is by no means adequate for the vastly increased volume of traffic which in recent years it has had to bear. It has been said, indeed, that practically every one of the existing main roads is over a century old. The last few years have seen the expenditure of a great deal of money on widening and generally improving existing roads but hardly any has been spent on the construction of new roads.

On the Lancashire side of the Mersey there is a fairly complete system of radial roads starting from Liverpool. The chief lines of communication are the roads to Southport and Preston in the north, and the road through Prescot and Warrington to Manchester, the Midlands and the south. Between the Preston road running north-east and the Prescot Road to the east there is a large gap in the radial system: there is no road direct to Wigan. The gap, however, is of little significance as the volume of traffic to and from Wigan, where the chief industry is coal mining, is extremely small. Southport, Ormskirk, St. Helens and Widnes are, in addition to Liverpool, all important centres of road communication. In the Wirral, the only road of more than local importance is that between Birkenhead and Chester; but it is fairly well served with a network of secondary roads, though considerable improvements might be made (see p. 108).

Two further developments are now proceeding which will be of the utmost importance to the transport system of Merseyside. These

are the Mersey Road Tunnel and the East Lancashire Road. The first contract for the new Tunnel was placed in 1925 and it is hoped that it will be open for traffic in late 1932. Its total length is nearly three miles, and the width of the roadway sufficient for four lines of traffic. There is no doubt that the tunnel will greatly facilitate traffic between Liverpool—indeed Lancashire generally—and North Wales, for at present the only method of crossing the Mersey and of avoiding the circuitous detour through Chester is to use the expensive and not very rapid steam ferry. The next important effect of the tunnel will probably be to increase the commercial predominance of Liverpool over North Wales and Cheshire and to hasten the process of centralisation in retail distribution which is already well started. The second new road development, the East Lancashire Road, has in view the closer linking of Liverpool with Manchester and with industrial Yorkshire. At present the main road to the east is the winding and inconvenient Prescot and Warrington Road, whose surface has been made almost intolerable for light vehicles by the constant stream of heavy traffic.

(v) *Road Traffic.*

The enormous increase in the volume of road traffic in recent years is shown by Table C and Diagram 5 which are based on the "assumed vehicle weights" of traffic passing certain points on the city boundary of Liverpool during selected weeks in January and July of each year from 1924 to 1931.† All the principal roads leading out of the city are included with the exception of Derby Road through Bootle, the traffic on which at the boundary point is mainly urban. The total tonnage figures are, of course, merely estimates and the margin of error is wide. They are not divided into goods and passenger vehicles, but the Reports of the Ministry of Transport‡ on the official traffic censuses show that in other industrial areas there has been no great change in the distribution of the traffic between goods and passengers, and there is no reason to suppose that Merseyside would show different results. We may assume, therefore, that from year to year the volume of goods traffic and the volume of passenger traffic have moved upwards together, though of course the effects of changes of season on the two classes of traffic are very different.

Apart from seasonal variations, the volume of traffic has shown a very steady increase and in 1931 was over twice as great as in 1924. One interesting feature of the development of the last eight years is the *increased* seasonal variation. Up to 1925 the traffic increases steadily without paying much attention to the seasons. After 1925, however, though the annual volume continues to swell, there is a very distinct and fairly regular fall between the July of each year and the January of the next.

Two roads stand out from the ten on which the traffic census was taken. These represent the backbone of the main flow of long-

distance road traffic from Liverpool. The largest volume of traffic is carried by the Prescott Road through Warrington to the Midlands, Manchester and London. The other is Warbreck Moor, the main road to Ormskirk and Preston, along which goes the bulk of the traffic to the cotton areas. Warbreck Moor shows a very large seasonal variation. While in the winter it generally carries little more than half the weight of the Prescott Road, in summer the two are of about equal importance. The reason probably is that the Prescott Road traffic consists chiefly of goods, where volume varies only slightly from winter to summer. Warbreck Moor, on the other hand, which leads not only to industrial Lancashire but also to Blackpool, carries a far greater proportion of passenger vehicles which are notably more susceptible to the change of seasons. Another Merseyside road deserves special mention, namely the Southport Road, where the traffic is mainly passenger. For this route figures§ are available for 1925 and 1928 only, and they show that the tonnage passing the Crosby-Waterloo boundaries (where the road leaves the urban area) was in 1928 nearly four times as great as that in 1925. For the one important road on the Cheshire side of the Mersey, namely, the Chester Road, information exactly comparable to that obtained for Liverpool was not available, but it was found|| that the tonnage on this route in the summer of 1931 was about three-quarters of that on Warbreck Moor. The increase of tonnage between August, 1925, and August, 1931, was in the neighbourhood of 80 per cent.

TABLE C.
TONNAGE OF ROAD TRAFFIC ON MERSEYSIDE. 1924—31.

	1924.		1925.		1926.		1927.		1928.*		1929.		1930.		1931.	
	Jan.	July	Jan.	July	Jan.	July	Jan.	July	Jan.	July	Jan.	July	Jan.	July	Jan.	July
Ten Principal Roads out of Liverpool†	100	108	121	130	131	148	135	169	154	179	159	197	170	207	182	252
Prescott Road (to Warrington).	100	85	124	128	121	115	127	147	144	131	130	150	135	129	150	174
Warbreck Moor (to Preston).	100	131	123	141	131	177	132	178	144	202	154	195	164	206	202	318
Birkenhead-Chester Road.‡	—	—	—	100§	—	—	—	—	—	132§	—	—	—	—	—	170§
Liverpool-Southport Road.||	—	—	—	100§	—	—	—	—	—	375§	—	—	—	—	—	—

* After 1928 the Corporation adopted a different basis of calculating "assumed vehicle weights." To make the figures for 1929-31 comparable with those for 1924-28, the drop in traffic between July, 1928 and January, 1929, has been estimated from the average drop between July and January in the years before and after 1928-29.

† Figures supplied by Liverpool Corporation.

‡ Figures supplied by Ministry of Transport.

§ August.

|| At Crosby-Waterloo boundary. Ministry of Transport Census.

Inside Liverpool the bulk of the short-distance passenger traffic is still carried by trams, which are excluded from the figures given in the Table. Indeed the Corporation—which owns a small number of 'bus lines and in most years makes a loss on them—has recently decided to abolish those 'bus services which compete with trams, and in the future to replace many other 'bus lines so far as possible with extensions of the tramway system. The greater part of the passenger traffic which goes rather further afield than the boundaries of the Merseyside boroughs is, however, conveyed by omnibus. The activities of the Traffic Commissioners have not yet made any serious impression on the motor-bus services in this area.

A curious feature of Liverpool is the remarkably small number of private cars in proportion to the population. One car is registered in Liverpool to every 92 persons and in Bootle one to every 116. The corresponding figure for Manchester was 52, for Birmingham it was 36, Sheffield 60, Glasgow 90, London 44, while for England as a whole it was 40. In Birkenhead and Wallasey there is one car to every 64 and 43 persons respectively. The small number of cars in Liverpool is probably due chiefly to the fact that the greater part of the well-to-do population lives in suburban areas outside the City boundary, and to the geographical situation of Liverpool.

The goods transport side of road service is remarkably varied in organisation and is keenly competitive. A great proportion of it is in the hands of manufacturers and merchants who own their own wagons. The Royal Commission on Transport estimated that in Great Britain as a whole only 20 per cent. of the total road-borne goods is carried by hauliers working for hire. There is no reason to think that the Merseyside Area differs widely from the average. It is, however, the road hauliers who provide the main "problem" of road transport. While there are a considerable number of large haulage firms, with fleets of wagons, it is said that about 30 per cent. of the haulage is done by men or firms who own not more than three vehicles each. These small hauliers generally reach their customers through clearing-houses, of which about 30 exist in Liverpool. The clearing-houses generally bargain first with the merchants who have goods to send, and after taking their commission (of 10 per cent. or upwards) pay the rest to the hauliers. The small haulier, who is frequently not only the capitalist but also the driver of his wagon, is an easy prey to the more unscrupulous clearing-house manager. He is not often financially in a position to haggle, and he is probably in urgent need of cash to pay wages—if he has any employees—or the instalments which may be due on his lorry. It is thus clear that the road haulage rate is often an uneconomic one.

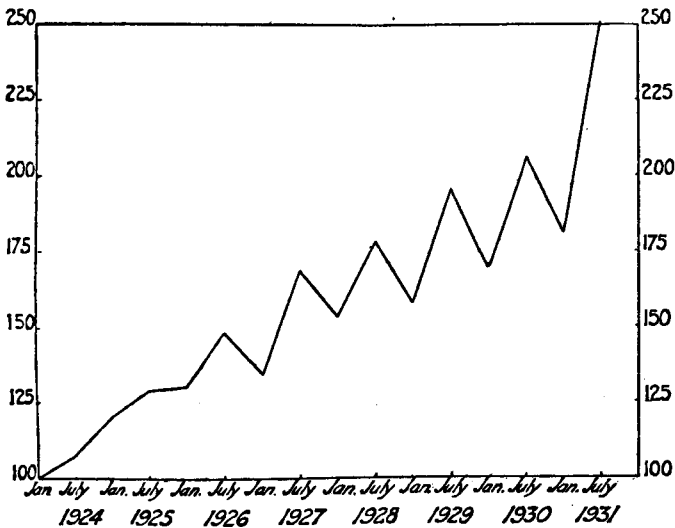
The considerations governing road rates are very similar to those governing rail rates. Indeed very frequently the road rate for an article is based simply on the rail rate and especially designed to

capture, with a minimum loss, traffic previously carried by rail. A few clearing-houses and hauliers offer a fixed ton-mile rate for all goods of whatever description; but mostly the rates vary according to the nature of the commodity, according to the anxiety of the haulier to capture a class of traffic from the railways, according to bulk, care of handling, size of consignment and so on. For standard commodities and standard journeys something in the nature of a "rate-book" is beginning to come into existence among the better organized firms, but in many cases the rate is still the result of an individual bargain.

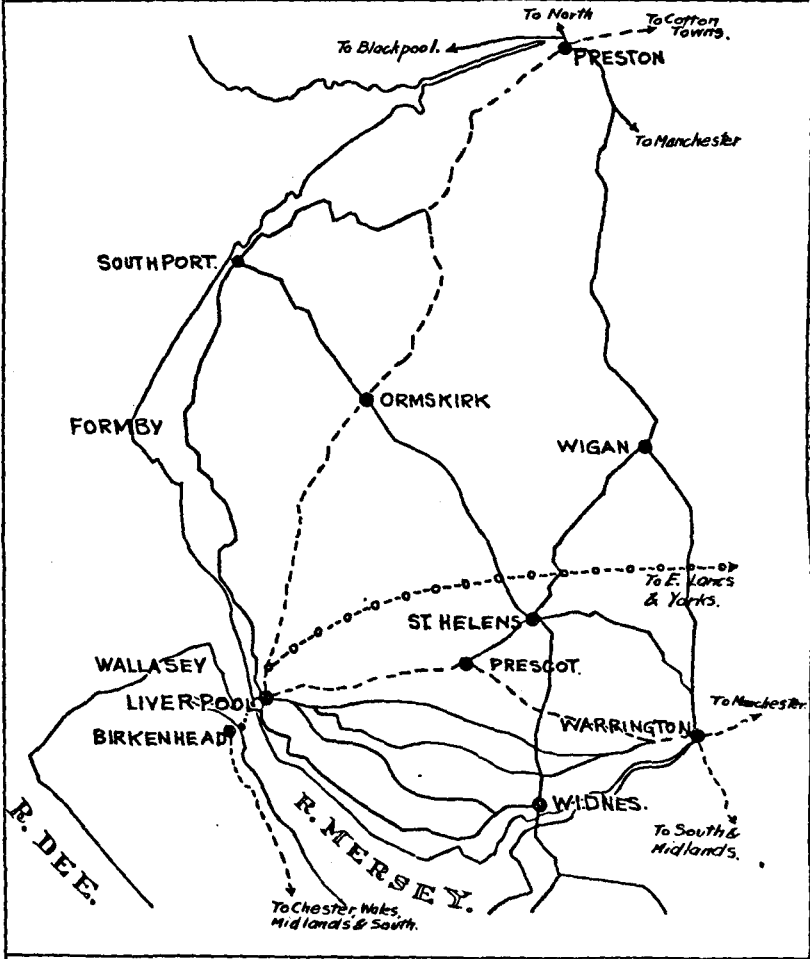
In the course of time, no doubt, growing stability and organisation will put out of business many of the smaller units now running uneconomically. The amount of capital required to set up a haulage business on the instalment system is so small, however, that it seems highly improbable that the number of firms will substantially diminish for many years, or the industry become to any degree rationalized without external assistance. Many of the more reputable hauliers and clearing-houses declare themselves in favour of a licensing system and of a certain amount of supervision, and, while it must be recognized that independence is in itself valuable, it can hardly be denied that many "self-sweated" owners of motor wagons would be far better off under a more strictly controlled system.

DIAGRAM 5.

Index of Total Tonnage travelling over ten principal Roads crossing the boundaries of Liverpool 1924-1931 (Index: Jan., 1924 = 100).



ROAD TRANSPORT ON MERSEYSIDE.



- Principal Roads out of Liverpool.
- .-.-.-.- Important New Road nearing completion.
(i.e. East Lancs. Road and New Mersey Tunnel.)
- Other Roads.

(vi) *The Competition between Rail and Road Transport.*

Consideration of either railways or roads in isolation has only a limited value, for to a great extent the main problem of each method of transport is its effective co-ordination with the other. It has not been possible to obtain accurate information as to the relative volumes of traffic carried by rail and by road but a glance at Tables B and C, and at the diagrams based upon them, immediately reveals the essentials of the comparative position.

The figures for road traffic, as has already been explained, can only be taken as an approximate indication of the volume of goods carried, but there is no doubt that while in 1930 railway goods traffic was only 85 per cent. of its volume in 1924, goods traffic on the roads rose between those two years by a figure possibly approaching 80 per cent., on the assumption already mentioned that goods and passenger traffic on the roads have increased by much the same proportion. While the volume of traffic on the railways shows—with occasional revivals—an unmistakable downward trend, that on the roads mounts steadily upwards. During the course of the Survey it was possible to discover the opinions held by a large number of manufacturers and distributors about the transport facilities provided. There is undoubtedly dissatisfaction with the railway services: it is felt that the companies, by reason of their heavy responsibilities inevitably conservative, have not yet succeeded in adapting their methods to the extremely difficult conditions of to-day.

But though many traders have expressed their preference for road transport, it is not always because road transport is cheaper. Indeed it was stated by a road haulier that about 50 per cent. of the tonnage carried by road is carried at rates above, though very little above, the corresponding rail rate. On the other hand a firm of metal makers said it was cheaper to bring goods from Hamburg by sea to Manchester than to send them from Liverpool by rail, while a steel manufacturer stated that the rail rate for pig-iron from Staffordshire to Shotton in Cheshire (60 miles) is 6s. a ton, while the freight rate by steamer from Antwerp to Liverpool is only 8s. a ton. At the same time complaints of heavy rail rates were fairly general from manufacturers and sellers of gas meters, flour, chemists' goods, ropes, sweets and confectionery, leather and vegetable produce. (The rates on some of these articles—notably on vegetable produce—have since been reduced.)

There are, however, three other factors of as much importance as comparative transport changes. The first of these is convenience of service. Road hauliers can provide door-to-door service. The second is safety. Owing, in great part, to the necessity for more than one loading and unloading of goods conveyed by rail and to the process of shunting, breakages are generally said to be more frequent on the railways than on the roads. It was stated by the representative of a firm of dealers in glassware that, while there

were breakages in a large proportion of railway consignments, comparatively little damage occurred among goods sent by road. A firm dealing in wireless components and delicate instruments declared road transport to be more satisfactory for the same reason. Brittle commodities may, of course, be sent by passenger train to ensure safe delivery, but the extra cost is substantial. Also, delicate goods may be sent at Company's Risk rates, but again the constant sending in of claims and collecting compensation adds to expense. The third factor is speed. Railway carriage is usually slower than road transport owing partly to time taken in terminal services, collection and delivery, and partly to shunting operations. As one example, not claimed as typical, it was said that a load of hides despatched by road from Garston in the evening would reach London the following morning, whereas the same consignment if sent by rail would take three or even four days to arrive.

Road hauliers have one very considerable advantage over the railways. The former are not "common carriers", obliged by law to carry at a reasonable rate whatever goods are consigned to them. They can pick and choose their traffic, devoting their energies to capturing that part which is most profitable to themselves. They can, in short, skim off the cream and leave the railways to cope with the rest. The "cream", of course, is the high valued traffic which goes in fairly small loads. The hauliers can refuse to carry articles such as coal and raw materials, while the railways are obliged to take them, and they are at the same time losing the more profitable traffic which would serve to balance the low receipts from these. The result is that the railways by extensive quoting of exceptional rates do their best to compete with the road hauliers in certain competitive classes of traffic, and in order to succeed they are obliged to charge high rates for the types of traffic in which they still enjoy a comparative monopoly. Some of the most vigorous complaints against high rates came from those who dealt in such articles as pig-iron and steel sheets. The significance of this is obvious. It is precisely for this type of commodity that a reduction in the cost of production and of transport is essential if the export trade of the country is to be revived.

What steps have the railways taken to counter the diminution in their traffic and the competition of road transport? To a limited extent, the railways have adopted the road hauliers' own weapons. They have been able to do this in three ways. First of all, as indicated above, it has been possible to adapt the railway rate system to the competitive rating methods of the road hauliers. Since there is as yet no standardized system of road rates, but, within limits, each contract can be the subject of an individual bargain, a road haulier can quote a price based on an existing railway rate. The railways are able to counter this by the use of exceptional rates below their standard rates. As is well-known, exceptional rates were originally introduced for the purpose of meeting the competition of coastwise water transport, and by 1921

something like 80 or 90 per cent. of the total railway tonnage was generally believed to be carried at exceptional rates. One of the objects of the 1921 Railways Act was to eliminate this and bring all traffic back on to the standard rate system. The new factor of road transport has, however, prevented that object from being realised, and it seems very likely that at present quite as large a proportion of railway traffic as in 1921 is still carried at exceptional rates.

The railways, to secure traffic, can therefore quote a special rate designed to beat the road haulier. They are, however, restricted by the 1921 Act. All exceptional rates more than 40 per cent. below the standard have to receive the approval of the Railway Rates Tribunal, and this frequently means delay and loss of contracts. Further, the prohibition of "undue preference" means that if an exceptional rate is quoted by the railways in one case it must also be granted in all other cases where the conditions are the same. Thus, if a district goods manager in Liverpool quotes a special rate for a large consignment of steel girders for a 50 mile journey, a trader wishing to send a similar consignment from Manchester for the same distance can demand the same rate. It can readily be understood that, in vast organisations like railway companies, such provisions prevent the rate system from being as flexible as the rates quoted by small road hauliers or clearing-houses.

In the second place, the railway has been able to secure some of the advantages which road transport possesses by giving door-to-door service. This the railways do by the use of "containers", large boxes into which goods are loaded on a lorry at the factory, and which are then transferred by crane to a railway truck and on to a lorry at the other end of the journey for delivery to the consignee. This method is used chiefly for transporting furniture and fragile goods. It not only gives more convenient service but also obviates the risk of damage. The container system has been widely used on American railways for more than a decade, but until recently its use has been relatively limited in this country. Naturally, the container is of little advantage unless large consignments are sent and unless considerable distances are travelled, but it has been suggested that more use might be made of it by British railways.

Thirdly, the railways have themselves branched out into road transport by acquiring interests in road transport companies. This applies to passenger traffic only. Thus, on Merseyside, the L.M.S. has substantial financial interests in, and working agreements with, the two most important 'Bus Companies in the area, which cater for the greater part of the suburban and moderately long-distance passenger traffic in Lancashire and Northern Cheshire.

It is only fair to say that not all manufacturers and distributors complained of the railways. One rather special class of traffic important in this area is that in livestock and meat, and for this class it was said that the facilities provided at Liverpool and Birkenhead are excellent. In the fruit trade, too, the co-operation of the railways at the docks enables fruit landed here in the morning to be sold at the Fruit Exchange and to reach London in the afternoon of the same day. Firms engaged in other industries also informed us that there has been recently a distinct improvement in railway services especially between Merseyside and the South of England.

Responsibility for the alleged deficiencies in the railway system cannot all be attributed to the railway companies. They say that they are only too willing to listen to complaints and to discuss them with traders, but that traders are reluctant to co-operate. Shortly after the War there was set up in this area, as in others, a Traders' Panel where representatives of traders could periodically confer with representatives of the railways. It was much used at first, but, although the initiative in calling meetings lies with the traders, no meeting has now been held for nearly a year and it is said that even when meetings are held they are rarely of much value.

If it be true to say that a good part of what has been lost by the railways has been gained by the roads, it cannot fairly be claimed that the two compete upon equal terms. The elaborate system of government regulation of railways, especially of rates and wages, was evolved primarily to prevent them from exploiting their monopoly position to the public disadvantage. To-day that monopoly—so far as most traffic is concerned—has disappeared, but the regulation remains. To place rail and road on the same level, either railway control could be relaxed, or, alternatively, a co-ordination of the two chief branches of this national transport system could be attempted for goods traffic on lines similar to those already being worked out for passenger traffic by the Area Traffic Commissioners. As things are now it certainly cannot be claimed that the most economical division of service between them is achieved.

(vii) *Canals.*

Three canals enter the area covered by the Survey. The most important of them is, of course, the Manchester Ship Canal, which joins the Mersey at Ellesmere Port. Discussion of its traffic does not, however, come into our province. The Shropshire Union Canal unites with the Manchester Ship Canal just before the latter enters the river. This canal and its connections cover Shropshire and Central Wales and touch the industrial area around Wolverhampton. Throughout the post-war years it has carried a very steady volume of traffic; the figures of tonnage conveyed show indeed an increase from 1924 to 1928 of 30 per cent. although

between 1928 and 1930 traffic has fallen again almost to the 1924 level.

The Leeds and Liverpool Canal takes an extremely circuitous route through central Lancashire and the Pennines into Yorkshire. It, too, continues to carry a considerable though diminishing traffic, the bulk of which is concentrated in the section between Liverpool and Wigan. The canals are used mainly for commodities such as coal which are heavy in proportion to their value and where the time-factor in distribution is of little importance. Sugar and polishing materials are two further examples of products of which a certain proportion are sent by canals. The complaint most frequently made against the canals is that they are not only slow but that they do not touch the most important centres of distribution.

TABLE D.

TONNAGE CONVEYED OVER CANALS.

	Tons (000's).						
	1924.	1925.	1926.	1927.	1928.	1929.	1930.
Manchester Ship Canal ...	5,456	5,476	5,134	5,528	5,392	5,814	5,516
Leeds and Liverpool ...	1,874	1,738	1,385	1,804	1,631	1,653	1,511
Shropshire Union...	373	427	451	477	484	433	379

(From Railway Returns 1924-30.)

General, Government and Public Utility Services.

The industries in this Group fall naturally into three divisions. The first provides what may be described as "General Services"; the second includes some, but not all, persons in service under the Government or Local Authority; and the third is concerned with the provision of Public Utilities. It is clear that employees of Public Utility undertakings which are municipally owned would go under the previous head, had they no class of their own. Similarly, 'bus and tramway employees are in a class by themselves, grouped under Transport which has already been discussed.

(i) General Services.

This is a mixed group comprising as its most important constituent over 17,000 workers who in 1930 found employment in *Hotels, Cafés and Laundries*, in addition to persons engaged in *Professional Services* and in *Entertainment*. Unemployment among males has been below the average, and more than the average number of males has been attracted to these industries from others or as young recruits. Unemployment among women and girls, on the other hand, was just as much above the average; but, in spite of that, the number of girls attracted to them has also been well above the average for all industries. This may be because they offer more

openings for young girls than most other industries. The proportion of adult women has gone down relative to other classes between 1924 and 1930.

The *Hotel* business in the area, judging from the replies to the questionnaire, seems to be about stationary. The three largest hotels are all under Railway management and, though one seems to have lost a little ground to another, the total number of employees is only very slightly higher than in 1924. Most large hotels have restaurants patronised by many more people than the hotel residents, and the fortune of hotels is linked consequently with that of the restaurant business. There is marked competition between *Cafés* and *Restaurants*, but, taken altogether, they undoubtedly increased their employment and their business between 1924 and 1930, and the depression has affected them no more seriously than the retail trade in general. But unless trade revives the prospects for the immediate future are not bright.

Laundries, Dyers and Cleaners appear to have extended their operations in recent years and new businesses or branches have been set up. Competition here, too, is exceedingly keen. At present, however, the effects of the slump are undoubtedly beginning to be felt and it is feared, as in the case of *cafés*, that continued depression must lead to a serious reduction in business and employment.

The number of people requiring *Entertainment* is no doubt as great in times of economic depression as in prosperity, and most of the population seem able and willing to pay for it. Unemployment is, nevertheless, serious among those providing entertainment, and this may be in part explained by the partial ousting of the theatre by the cinema—a process accelerated since 1927 by the commercial success of the talking picture.

TABLE 5 (VIII).

Incidence of Unemployment in Different Industries and their Relative Attraction for Labour.

Industry.	Numbers Insured in 1930.				Unemployment Index. (Mean 1923-1930.)		Index of Industrial Attraction. (Numbers Insured in 1930 relative to 1924.)			
	Men.	Boys.	Women.	Girls.	Males.	Females.	Men.	Boys.	Women.	Girls.
Hotels, Laundries, Entertainment and Professional Service.	7,720	720	11,430	1,430	72	129	122	104	98	143
Government Service, national and local.	11,160	270	720	60	62	61	93	79	74	—
Gas, Water, Electricity	5,720	180	320	40	23	62	64	—	144	—
Tram, 'Bus Service ...	5,380	40	110	20	—	—	—	—	—	—

TABLE 6 (VIII).

Percentages Employed in Each Industry by Sex and Age, 1924 and 1930.

Industry.	Numbers Employed in 1930.				Year.	Percentages Employed.			
	Men.	Boys.	Women.	Girls.		Men.	Boys.	Women.	Girls.
Hotels, Laundries, Entertainments.	6,010	650	9,120	1,290	1924	32	3	60	5
					1930	35	4	53	8
Govt. Service, national and local	9,560	270	670	60	1924	89	3	8	0
					1930	91	3	6	0
Gas, Water, Electricity	5,390	170	280	40	1924	96	2	2	0
					1930	92	3	5	1
Tram, Bus Service	5,290	40	110	20	1924	86	0	14	0
					1930	97	1	2	0

The cinema requires fewer employees per head of the audience than the theatre : a theatre so long as it exists at all, requires about the same number of persons to operate it. Consequently, the effects of theatrical depression come slowly ; it is not until a theatre closes down, or becomes a cinema, that any very noticeable change in employment is felt. It is believed that between 1924 and 1930 only one theatre became a cinema, and none closed down. The theatre, though it has suffered severely in the last few years, is now holding its own ground and it appears improbable that the future will see any further diminution of employment. The acting profession is, however, overstocked. One influential theatre director expressed the opinion that the future of the stage is not likely to lie in providing great " spectacles," requiring the services of hosts of performers, technicians, and scene-shifters, for these things can evidently be done better by the cinema. Mechanical devices reduce the need for labour about the stage. The " rationalised " theatre of the future, then, is not likely to increase the demand for labour. There is no doubt that the cinema, on the other hand, is still increasing its business. One very large cinema has been opened this year, and preparations are being made for the construction of another. At present, as a rough estimate, from half to two-thirds of the population are cinema-goers, so there is room for increasing this number without reducing theatre audiences.

What has been said of the theatre applies in a modified degree to other forms of entertainment. The general conclusion is that employment is likely to increase, but the proportion of entertainers and other workers to members of the audience is so small that the increase is not likely to be considerable. There has been no very noticeable development in the number of paid workers associated with sport.

(ii) *Government Service, Central and Local.*

In Government Service, national and local, unemployment has been very low, mainly owing to the existence of superannuation schemes which tend to preserve the stability of labour and to anchor it to a selected occupation. But these services have not attracted new workers in great numbers. The total of those employed by the

central government has diminished, but there has been an upward trend in the number employed by the Liverpool Corporation (excluding those employed in public utility and tramway services). The departments chiefly responsible for the increase of staff were the Surveyor's and the Housing Departments.

(iii) *Public Utility Services.*

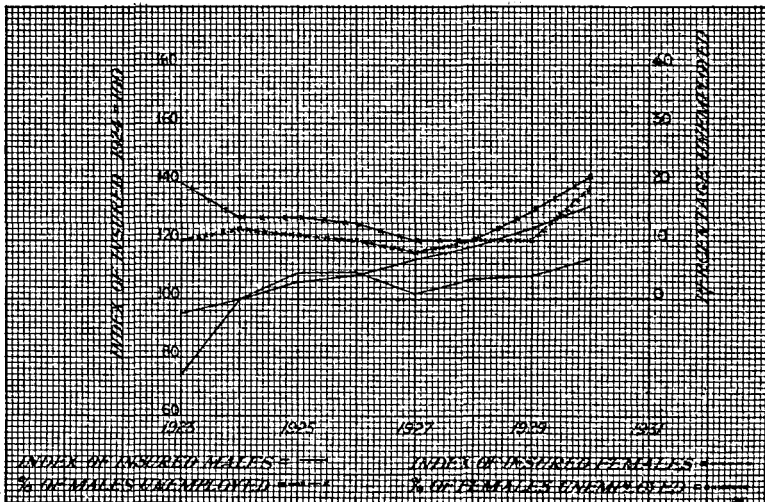
In Gas, Water and Electricity, unemployment, again, has been low but, as in the case of Government Service, new workers have not been attracted. In the Tram and 'Bus Service the employment figures obtained are not reliable.*

While the Tramway Service in Liverpool has recently been making a considerable profit, the motor 'buses have been operated at a loss. Consequently the Corporation have decided to abolish most of the 'bus services which compete with trams, and to concentrate on maintaining and improving the efficiency of the tramway system.

The Merseyside Corporations in common with most others will certainly respond to the call for a reduction in expenditure, though the details of their policies have not yet been decided. This will inevitably result in further unemployment in the area. The Liverpool Corporation alone employed roughly 14,000 insured workers in 1930. Even a 10 per cent. reduction on this total would mean 1,400 thrown on to the labour market at a stroke, and not many of them would stand much chance of immediate reabsorption under present conditions.

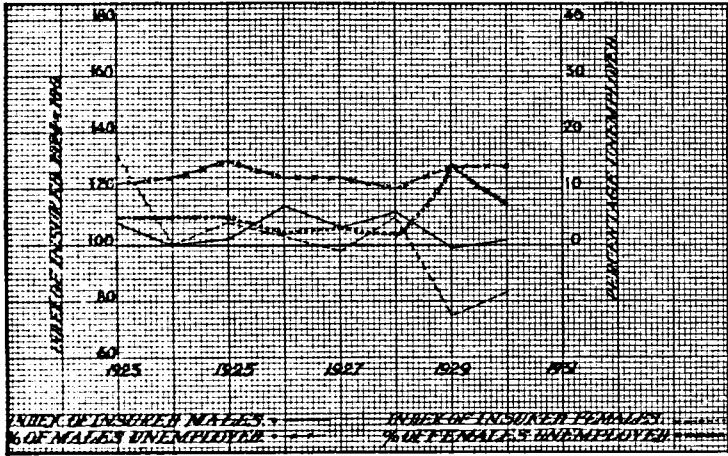
HOTELS, LAUNDRIES, ENTERTAINMENTS AND PROFESSIONAL SERVICE.

Index of insured persons and percentage unemployed 1923-30.



GOVERNMENT SERVICE, NATIONAL AND LOCAL.

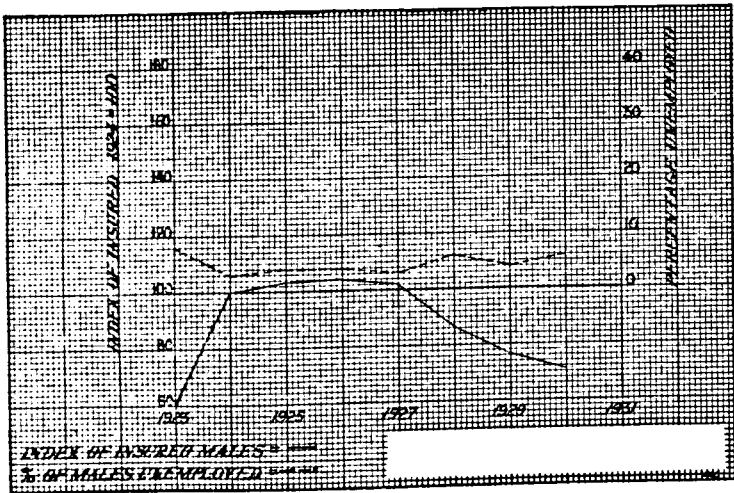
Index of insured persons and percentage unemployed 1923-30.



GAS, WATER AND ELECTRICITY.

Index of insured persons and percentage unemployed 1923-30.

Males only.



C. Building and Associated Industries.

(i) *Employment.*

It has been found convenient to group together under " Building and Associated Industries " the various allied trades : Building and Contracting ; Wood-working and Furnishing ; Brick Manufacture and Pottery. These are chiefly trades which thrive when building thrives. Bricks and tiles, for instance, are needed to build houses, and it is no use building houses if they are to be empty of furniture. As one evidence of the interdependent movement of these trades, it may be noted that each records an increase in employment from 1924 to 1930 ; and as a group they are unique in this respect among the nine groups of industries of this area.

The increase of employment in Building from 1924 to 1930 was 31 per cent., a considerably greater expansion than is shown in the country as a whole. This high rate of growth has no doubt been due largely to the construction activity fostered by Government subsidies and to the extensive development of Corporation Housing Estates on Merseyside.

The " Index of attraction " given in Table 5 appended to this section shows that Building has in recent years attracted many more new recruits among adult males than the average industry, and effectively disposes of the belief that labour is rigidly prevented from entering this trade.

Much the same position is found in the other trades within the group. Each has exercised a considerable power of absorption of adult male labour. The expansion in Furniture making is marked by a 25 per cent. increase in employment of all types from 1924 to 1930. In Sawmilling and Box-making the increase during the same period was 12 per cent. Other associated industries similarly advanced, the whole group being one of the more prosperous sections of Merseyside industry during the period under review.

With this basis of fact, it will be necessary to enquire into the causes of the remarkable expansion shown, and to discover whether it is likely to continue (see graphs, pp. 131-3).

(ii) *The Aim of the Enquiry.*

As in the case of many other industries the development of Building depends primarily on conditions external to its own enterprise. The two chief divisions in the industry are :—(1) factory or business construction ; and (2) house building. Of these, the first is peculiarly sensitive to the general state of trade. The amount of construction undertaken for trade purposes probably fluctuates more widely than the average level of trade itself ; new offices, factories and communications are essentially " boom requirements " and their construction is reduced to a minimum when trade declines.

As to the second main activity, house construction, since the War ended, building, of all industries, has been the most subject to

public enterprise and the expenditure of public money. This increases its exceptional dependence on outside factors and renders it unique in one respect—the absolute impossibility of forecasting its condition after the completion of existing housing schemes.

Despite the overriding importance of these external and indeterminate conditions, there is one way in which influences within the industry may substantially affect its development, namely, through the reduction of building costs. There are strong grounds for the belief that, were it possible to reduce the cost of new houses, the demand for the houses would increase at least in proportion. Householders have as a rule a definite sum in mind for expenditure on rent, and, were rents to be reduced, more money would be spent on house-room. If the hypothesis were taken that every householder sets aside an absolutely unalterable amount of his income for rent, then any fall in rents (say, due to a fall in building costs) would lead to an *exactly* proportionate increase in the demand for house-room. Although this hypothesis cannot represent precisely the existing position, it is no doubt a fairly close approximation to it; and at least it indicates the significance of the factor "cost" in any consideration of the future of the building industry.

TABLE 5 (III).

Incidence of Unemployment in Different Industries and their Relative Attraction for Labour.

Industry.	Numbers Insured in 1930.				Unemployment Index. (Mean 1923-1930.)		Index of Industrial Attraction. (Numbers Insured in 1930 relative to 1924.)			
	Men.	Boys.	Women.	Girls.	Males.	Females.	Men.	Boys.	Women.	Girls.
Building and Contracting	24,160	1,560	800	10	91	87	128	101	101	—
Oilcloth, Brushes, Watches, Instruments, Toys.	3,860	400	1,400	350	143	124	119	88	94	84
Furniture, Upholstery ..	2,230	300	450	110	68	103	120	137	93	—
Sawmilling and Machined Woodwork.	2,030	270	320	40	86	156	103	118	71	—
Bricks, Pottery, Cement, Glass.	1,000	100	100	—	83	—	119	—	—	—

TABLE 6 (III).

Percentages Employed in each Industry by Sex and Age, 1924 and 1930.

Industry.	Numbers Employed in 1930.				Year.	Percentages Employed.			
	Men.	Boys.	Women.	Girls.		Men.	Boys.	Women.	Girls.
Building and Contracting ...	18,320	1,420	280	10	1924	90	8	2	0
					1930	92	7	1	0
Oilcloth, Jewellery, Instruments	2,140	360	1,150	320	1924	58	8	27	6
					1930	54	9	29	8
					1924	66	13	18	3
Furniture, Upholstery ...	1,770	440	370	100	1930	66	16	14	4
					1924	72	9	17	2
Sawmilling, Woodwork, etc. ...	1,670	240	260	40	1930	75	11	12	2
					1924	75	9	13	3
Bricks, Pottery, etc. ...	780	90	60	—	1930	84	10	6	0
					1924	75	9	13	3

Accordingly, the whole emphasis of that section of our Survey which relates to building has borne upon the question of costs. An enquiry addressed to those actually engaged in the industry must inevitably be concerned for the greater part with internal conditions: and of these the most significant are—the cause and extent of the recent fall of building costs; and the prospect of a still further decline in the future.

The method of enquiry adopted in the case of Building has been, as for most other industries, to circulate a questionnaire to all building firms in the district employing a staff of more than 50 persons and to follow this up by personal enquiries whenever special points of interest were raised in the replies.

With the aid of the answers received to these questions and information gathered in personal interviews, together with detailed figures supplied by Municipal and State Departments, sufficient data were collected to throw some light on the question which forms the ultimate object of this enquiry, namely, the employment capacity of the industry in the coming five years.

An attempt will be made to show:—(1) The extent to which the future employment capacity of the industry is likely to be influenced by *factors affecting building costs*; (2) The degree of activity likely to result from the *housing schemes of Local Authorities*.

(iii) *The Recent Fall in Building Costs.*

The following figures have been kindly supplied by the Ministry of Health, showing the changes in building costs since 1924 for the whole of England and Wales, and for Merseyside, distinguishing between tenements and houses.

Average cost per superficial foot of all houses in contracts let by, or in direct labour schemes of, local authorities in the Merseyside Area during 1924, 1925 and 1930, and also for England and Wales as a whole during the same years:—

	Merseyside Area.			England and Wales.		
	1924.	1925.	1930.	1924.	1925.	1930.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
All working-class dwellings.	11 8½	11 9	9 0	10 4½	10 10½	8 11½
Houses	10 10½	11 8½	8 11½	10 3½	10 10½	8 10½
Tenements	16 9½	16 9½	14 0	15 11½	13 1½	12 3½

These figures indicate that, for England and Wales as a whole, the cost of working-class dwellings fell about 14 per cent. from 1924 to 1930. For the Merseyside Area the decline during the same period was 18 per cent. for houses and 17 per cent. for tenements.

This evidence, as regards houses, is supported by further data from a local source. The Liverpool Housing Department has supplied the figures below, showing that from 1924 to 1930 the fall in the cost of houses per superficial foot, in Liverpool, was about 17 per cent.

Year.				Average Cost of Houses per superficial foot. (Liverpool.)	
				s.	d.
1920	...	...	..	17	6
1924	...	..	...	11	2
1925	...	..	...	10	9
1930	...	..	...	9	3
1931	...	...	...	8	11

The estimates received from private building firms in response to the questionnaire showed reductions in building costs varying from about 14 per cent. to 25 per cent. It may be assumed, therefore, that both for private contracts and for municipal schemes the cost of working-class dwellings as a whole fell not less than 17 per cent. from 1924 to 1930.

The significance of such a fall is that it *may* have given rise to an increase in the demand for houses, an increase which would continue to influence activity in the industry in future years. But it can only have had this effect if the 17 per cent. reduction was greater than the general decline in wages during the same period.

From 1924 to 1930, money wages fell probably not more than 1 or at most 2 per cent. (The Ministry of Labour index of wage rates in December 1924 was 70 to 75 per cent. above the level of July 1914, and 70 to 74 in December 1930). During the same time unemployment increased 5.7 per cent. In effect these two percentages together fall far short of the 17 per cent. estimated minimum decline in the cost of houses. If account is taken, further, of the effect of unemployment insurance, it may be inferred that building costs fell considerably more than total working class income, and that the effect of the fall was and will be to stimulate somewhat the demand for houses.

(iv) *Causes of the Fall in Building Costs.*

The chief interest is to discover whether the decline recorded in the past is likely to persist. If the existing low level of costs is maintained, demand may be expected at least to show no decline from the present position. If a further decline in costs may be anticipated, demand will probably expand still further. It is necessary to analyse the recent movement, therefore, with a view to discovering its underlying causes.

(v) *Cost of Building Materials.*

There appears to be no official or other publication in which the prices of materials of construction are quoted for the Merseyside Area. The opinion of employers in this area is unanimous, however, that a substantial decline has taken place in such prices, and that this has been without question the outstanding cause of the recent fall in building costs.

But reliable information exists showing the extent of the fall in the cost of materials used in *public* construction. The Ministry of Health has communicated the following statement showing the percentage reductions from 1924 to 1930 in the various costs involved in the erection of dwelling houses by or under contract from local authorities in Merseyside.

	Per cent.
Materials	21·58
Labour	12·03
Overheads and Profit	17·64

Since the fall in the price of materials has been of such predominating importance in the last seven years, enquiries were made of contractors to discover whether in their opinion the fall has been due primarily to the general depression of trade and foreign competition, or whether it has resulted from special factors such as standardisation, rationalisation or other concerted policies likely to yield a continuous decline of prices. The opinion of contractors is that, although there has been some progress in the standardisation of building materials in recent years, there is as yet no comprehensive movement either for standardisation or for economy through co-ordination among producers of construction materials. Moreover, there is a fairly early limit to the reduction of prices by standardisation. Such things as doors, window frames, and timber supplies generally have been produced in standard forms for many years; but in the case of most requirements such as bricks, slates, cement, lead and iron, little *economy* is possible simply by producing these things to standard specifications. Economy comes only when standardisation permits the machine to take over work previously done by hand.

The widespread impression among contractors is that the recent fall in the cost of materials has been due almost wholly to the two general factors which have affected the trade of the whole country. In the first place, there has been a general shrinkage of demand due to the universal slump; this has broken up effectively any selling agreements that may have existed among producers to maintain prices. Secondly, foreign competition has increased and now affects substantially all the main building materials. Timber, lime, cement, roofing materials, lead, iron, oils and chemicals of all kinds can be secured from abroad at prices which have obliged

British producers constantly to lower their quotations. And, in view of world conditions, the prices of these materials are at as low an ebb at they have been at any time since the War.

All influences considered, the prospect for the immediate future is that some recovery, rather than a further decline, will take place in the prices of materials. With the expansion of demand there will be a lifting of the pressure of competition both at home and from abroad, and prices will tend to rise to a point at which producers secure a more adequate profit margin.

The significant general conclusion is that a further reduction in the cost of building may not be expected from that factor which has been the chief cause of the movement up to the present, and that if the prospect of a continued reduction is to be established, this can be only through some other main element in cost—the cost of labour, overheads or profit.

(vi) *The Cost of Labour.*

The figures of the Ministry of Health, referred to earlier, showed that whereas for England and Wales the labour cost per superficial foot of dwelling houses fell only about 8 per cent. from 1924 to 1930, the labour cost on Merseyside fell 12 per cent. during the same period. This difference was made possible because in the Merseyside Area wage agreements are reached by independent machinery. The employers' organisation for this district is known as "The Liverpool, Birkenhead and Wirral Districts Building and Allied Trades Employers' Association", and this meets and adjusts its labour regulations with ten workers' organisations representing different trades in the building industry.

The operative clause in the agreement relating to wage reductions for this district states that:—

The reductions in wages during the three years' period of the existing working rules are as follows:—

			<i>All Craftsmen.</i>	<i>Labourers.</i>
1 May, 1930	...	...	½d. per hour.	½d. per hour.
1 May, 1931	...	...	½d. per hour.	No reduction.
Total	...	...	<u>1d. per hour.</u>	<u>½d. per hour.</u>

This provision remains in force until 1 May 1932. Thereafter it will be necessary to establish new regulations; and, although predictions cannot be made with confidence, it may be noted that the present trend is downward, that the trade depression has deepened in the last two years, and that Liverpool rates of wages are said to be generally higher than those prevailing elsewhere.

Satisfactory relationships exist between the two economic groups. There is little complaint of limitation of output or of restrictive labour regulations, except in the case of the overtime rule which

involves application by employers to a joint committee for permission to work longer than the standard hours. It seems improbable that any change in labour regulations would materially reduce the labour cost of construction.

Apart from the reduction of wage rates, there thus appears to be no means of reducing the cost of labour directly. The substitution of machinery for labour, to be discussed elsewhere, might have this effect indirectly.

(vii) *Overhead Charges and Profit.*

The reduction in overhead costs and profit in the Merseyside Area has been roughly proportionate to the reduction in the whole cost of houses, that is, about 17 or 18 per cent. The implications of such a change are not easily assessed, since certain forms of economy, such as the substitution of capital for labour, just mentioned, would result in an *increase* in overhead charges. Probably the 17 per cent. reduction has been due chiefly to the lower cost of capital equipment and to a slightly lower profit margin on a lower money turnover. It is doubtful whether any substantial part of the movement has been due to changes in organisation or the increased size of business units, for reasons to be indicated below.

(viii) *Increase in the Size of Building Firms.*

The opinion was general among contractors interviewed for the purpose of the enquiry that a building firm cannot safely expand beyond an employment capacity of about 300 men. After such a point, the work of organisation becomes too heavy for a small management, and for various reasons large managements are less economical. In support of this view it is worth noting that among firms on Merseyside employing 50 or more workers the average number of insured workers was between 200 and 300,* and incidentally it may be mentioned that the last bankruptcy of note was that of one of the largest firms in the district.

The managerial task is one involving great attention to detail. Each contract gives rise to large numbers of minor decisions, all of which require the judgment of a responsible manager. After contracts have been made, re-adjustments are frequent, arising out of such considerations as weather, foundations, changes in works regulations or building methods, which, again, require managerial judgment. In the course of building, the following processes are involved:—architectural planning and design, quantity survey, contract by builder, excavating, concreting, drain-laying, bricklaying and masonry, carpentering and joinery, tiling, plastering, glazing, electric installation, gasfitting, painting and decorating. Every contractor, although directly managing only a limited number of these processes, must at least know sufficient of each to safeguard himself against the blunders of sub-contractors and to preserve coherence in the general plan of the contract. With such a wide field to

control personally, a builder cannot be expected to undertake many extensive contracts or to expand beyond the limits which experience has so far shown to be most reasonable and profitable.

The expansion of a firm by an increase in the number of managers reaches early limits for the reason that, unless each manager can place absolute reliance on all others, they are as a group compelled to check one another's decisions, and in so doing they lose time. Moreover, the work of each is not such as may be discussed once weekly around a conference table, but involves decisions which are both spontaneous and final. Hence, little simplification of administration is possible merely by multiplication of management.

(ix) *The Amalgamation of the Various Trades.*

Similar difficulties impede the amalgamation of firms in *different trades* into one large construction unit. *Prima facie* it would seem that the economies to be derived from co-ordinating trades and processes, avoiding delays in construction, spreading work over the "wet" season, and reducing supervision would be so great as to outweigh any disadvantages there may be in amalgamation. But there are several countervailing difficulties, as the experience of those firms which have progressed towards such amalgamation shows.

In the first place, although a contractor can and does know sufficient of all associated trades to co-ordinate their activities and exercise control, this is a different matter from promoting such trades. To conduct and be responsible for them all would involve intimate knowledge of such things as electrical installation, wood-carving, colour-mixing, graining and sign-writing, and of the qualities of materials required for the fine arts subsidiary to the trade. Even where the contractor achieves confidence in himself in these respects, it does not follow that architects and customers will share his confidence. Frequently a contract is let to a general contractor on the understanding that he shall employ other firms for certain specified branches of the work; his own men and material then remain idle, and the overhead costs involved for these branches of work are incurred with no return.

The conduct of each trade requires, in fact, a specialist; and the combination of such specialists into one financial unit, though yielding economies in some directions, produces a less free, spontaneous, elastic system than a group of separate units.

The problem of organisation appears to have been solved in America, not through amalgamation, but through the introduction of yet another trade. The responsibility for carrying out contracts for building in that country rests on an individual known as the "Building Organiser." It is he who receives the plans and specifications from the architect; and once the plans have been handed over it is he who takes the whole responsibility. His supreme function which justifies his intervention is to gain complete knowledge

of the efficiency of subordinate firms for different types of work, and to adjust their time schedules so that their rhythm is perfect throughout.

Apart from the adoption of a form or organisation, not necessarily of this order but capable of focussing the responsibility for construction on one pivotal unit, it is difficult to imagine in what way the building industry could be "rationalised" so as to yield economy in production. The present system under which the architect retains a partial responsibility during the whole period of construction and delegates the rest of it to a number of independent units which have no co-ordinating point is not conducive to swift and efficient building; yet it is not easy to invent a suitable form of organisation to replace it. Possibly the amalgamation of architects with contractors would meet the need; but tradition is against such a change.

For the purpose of this enquiry the conclusion may be accepted that the possibility of securing a general reduction of overhead charges in the immediate future through either an increase in the size of firms or the association of firms in different trades is negligible.

(x) *Replacement of Labour by Machinery.*

Superficially it would seem that a revolution is taking place in building methods, owing to the extensive development of machinery. Among inventions recently added to the recognised plant of the trade are:—steam excavators and grabs; air compressors; brick-making machinery; mechanical hoists and steel scaffolding clamped to the structure; electrical mortar and concrete mixers and distributors; improved cranes; circular diamond saws, and rubbing, polishing and planing machinery for masonry; artificial stone, machine-mixed; machine tools for mouldings, tenoning and morticing in joinery work; paint sprayers; machines for producing tiles and other roofing; motor conveyors and tipping wagons. In scarcely any department of building has machinery failed to show its value. Yet the advance, so far, has not *on the average* been great—a condition for which several reasons may be given.

The first is that no machine has as yet been found for carrying out the chief operation in building, namely, that of assembling the structure itself. The process is still, and is likely to remain, a hand-and-brick affair. Machinery can touch only the fringes of this main structural task.

A second reason is that most of the machinery involved is exceedingly expensive. Since the average firm in the industry generally is small (having an employment capacity of less than 100 men) the majority have not the means to buy the full complement of machines. Even if they could afford the machinery, they could not keep it all regularly at work, and it would not prove economical.

A possible indirect means of overcoming this difficulty, which is identical with that experienced in agriculture, would be to develop a subsidiary trade of machine lending or letting, or a co-operative system of common ownership. There is no evidence, as yet, however, that such methods could be widely applied.

(xi) *Transport Costs.*

It is generally recognised by contractors that mileage rates for road traffic are higher than railway mileage rates. But there is an increasing tendency among them to rely on road traffic, because it gives greater guarantee of speedy and punctual delivery—an imperative need when a whole contract may be held up by the failure of one load to arrive—and because less careful packing is required when goods are sent by road, there being no shunting nor inexpert handling during the journey. It was suggested from one quarter that a "cash on delivery" system, coupled with closer co-ordination between Carriers and Railway Companies, would increase railway turnover.

(xii) *Interest Costs.*

Information was received showing that the building industry suffers certain disadvantages in securing credit facilities, and is seriously affected whenever the rate of interest is high. A builder as a rule has no liquid assets which are suitable as security against loans, and he has no produce against which to draw bills. In consequence he may be compelled, in order to secure bank accommodation, to provide security in the form of deeds of mortgage, involving a preliminary inquisition into the firm's position and the attempt to answer questions sometimes unanswerable (e.g. the future profit on a contract). There is thus no swift method of securing new credit; and even after the credit has been allowed, the nervousness of lending banks and the constant enquiries they felt obliged to make transmit a sense of uneasiness to the borrowing firm. The results are cumulatively adverse, inasmuch as those firms which are strong enough to avoid borrowing, and the banks are left with only the insecure firms to support.

The level of the interest charge is also an important consideration. When a contractor requires aid from the bank it is usually to meet an exceptional and unforeseen contingency such as the failure of a customer to pay on a large contract, or the sudden expansion of the firm through its having secured several contracts simultaneously. Thus, since the capital outlay is large and varying, the rate of interest which the bank charges is a most important factor in costs and in the degree of risk that a builder can take when competing for contracts. A high overdraft rate may thus be reflected in a higher cost of building even though the overdraft is not actually used.

(xiii) *Long Period Interest Rates and Rents.*

In the attempt to reduce the cost of houses, with a view to stimulating demand, there are two entirely separate sets of factors to be considered. There are, on the one hand, the factors which may lead to a lowering of the structure's initial cost, and, on the other hand, there are those which may reduce the percentage which the tenant must pay, by way of rent, on this initial cost.

The rent percentage is composed partly of interest on the cost of the structure and the land, and partly on the cost of upkeep of the structure and depreciation. The one may be 5 per cent., the other 3 per cent., making a total of 8 per cent. on the initial cost of the structure.

Any factor which leads to the reduction of this 8 per cent. will be fully as significant a means of stimulating the demand for houses and of expanding the building industry as the factors which reduce the initial cost of the building.

Thus a fall in the long-period rate of interest will have a strongly invigorating effect on the building industry. If the rate fell from 5 per cent. to 3 per cent., investors of capital would be prepared to invest in buildings for a 3 per cent. net return. Rents would fall by 25 per cent. (from 8 to 6 per cent.) of the initial cost of the houses—an enormous change to the prospective tenant.

Similarly if more lasting and weather-proof materials could be found such that the cost of upkeep and depreciation of houses fell to 1 per cent., exactly the same effect would be produced for the tenant. With the lowering of rents more and bigger houses would be demanded, and the building industry would prosper.

These additional, potential influences are mentioned here rather with a view to indicating the difficulty of making a forecast of the future condition of the industry than of assisting the forecast. Although it is clear that the most significant single action which the Government could take, if it desired to expand the building industry, would be to adopt a monetary policy which would permit permanently low interest rates, yet it would scarcely seem possible to take into account any prospective change in rates in the attempt to predict the future condition of the industry. Such a movement is as speculative a prospect as is the discovery of some material which will double the life of a building without increasing its cost.

In the attempted forecast, those factors which bear solely on the rent-percentage will be ignored, and attention will be confined to those which may affect the initial cost of the structure. In respect of the latter a summary of the findings is as follows :—

Building Materials, having fallen in price extensively in recent years, so that little if any profit remains to producers, may be expected to show some recovery as trade generally improves.

Wages have recently fallen, and may continue the downward trend. *The size of the business unit* has not recently increased. A reduction of costs from this form of rationalisation is not to be expected. *The amalgamation of firms in different trades* is beset with much difficulty and on balance yields little economy. Cost reduction through this process may be ignored. *The continued substitution of machinery for labour* may favour a decline in costs, but the extent of the movement is likely to be slight.

Since building materials account for 50 per cent. of the total cost of a house, due weight must be given to their probable movement. Their anticipated upward turn must be regarded as likely at least to balance any fall in labour costs through the reduction of wages or the introduction of machinery. The final conclusion is, therefore, that the change in building costs in the future is likely to be only slight, and more likely to be upwards than downwards. For practical purposes it would seem reasonable to assume that, so far as private enterprise is concerned, house-building may not be expected to increase during the next few years as a result of a change in costs. Its condition is likely to depend almost wholly on circumstances external to it.

(xiv) *Number of Houses Built since 1924.*

In the past the amount of public building undertaken has varied widely from year to year, and, except in 1929 when trade improvement led to more active private building, has been responsible for marked fluctuations in the amount of employment given in the industry. The following Table, based on data supplied by Local Departments, permits a comparison to be made between subsidised construction programmes and total employment for the district :—

		<i>Number of Houses Constructed.</i>						
		1924.	1925.	1926.	1927.	1928.	1929.	1930.
CITY OF LIVERPOOL—								
Public Enterprise ...	88	491	3,102	5,728	2,440	1,411	1,169	
Private Enterprise ...	640	1,156	1,736	1,567	824	1,171	1,189	
BIRKENHEAD—								
Public Enterprise ...	230	272	268	550	372	208	128	
Private Enterprise ...	198	191	272	177	166	192	79	
BOOTLE—								
Public Enterprise ...	2	98	74	182	305	346	356	
Private Enterprise ...	—	—	—	—	—	—	6	
WALLASEY—								
Public Enterprise ...	23	77	260	244	22	23	300	
Private Enterprise ...	480	380	95	112	270	151	116	
Total ...	1,661	2,665	5,807	8,560	4,399	3,502	3,343	
Total relative to 1924 ...	100	160	350	515	265	211	201	
Index of Employment...	100	120	136	162	128	133	131	

(xv) *Future construction.*

The Local Departments were not able to forecast with assurance their programme for the period 1931-35. Prior to the economy legislation of the National Government, there was some expectation of an expansion in both public and private building, the average number of houses to be erected annually from 1932 to 1935 being estimated at over 5,000. Were such a programme to be maintained, there would be a prospect that, in spite of the decline in trade construction, employment in the building industry would remain about as high as in 1929 and 1930.

The inability of the authors of the present Report to forecast the future trend of employment in the Building Industry does not imply that the figures are lacking on which a forecast can be made. If the Government has fore-knowledge of the amount of the subsidy to be granted for housing in the coming years, and the approximate burden to be thrown on Local Authorities through the recent Economy Act; an estimate should be possible of the prospective level of Building activity. The value of attempting such an estimate cannot be too much emphasised in view of the fact that on Merseyside, as in the rest of Great Britain, the Building group of industries employs a high proportion of the total insured working population : 10.2 per cent. on Merseyside.

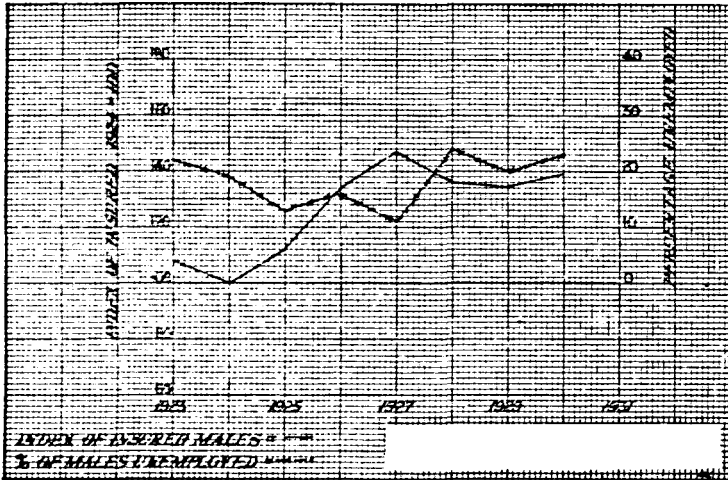
With a view to creating employment, and putting other considerations on one side, public money is generally held to be more effectively expended when used to subsidise private enterprise than when used to finance public works directly launched by the State. In the one case only the difference between the demand price and the supply price has to be met out of the public purse, whereas in the other the whole supply price has to be paid. A special plea might therefore be made for the continuance of a high building subsidy as a support to the labour market.

If it is difficult to forecast the effect of public expenditure on building activity in the immediate future, it is still more difficult to give a quantitative estimate of the effect on Building of the general recovery of trade. Two points may, however, be recalled in conclusion. The mobility of labour is not restricted so far as entry into Building is concerned. The industry has in the past expanded at an exceptionally swift rate, e.g. 62 per cent. on Merseyside from 1924 to 1927. It should be one of the first industries during a revival to absorb, not only its own unemployed, but also workers from other occupations. The second thought is that Building is pre-eminently a "prosperity" industry. When trade, generally, expands, a much more than proportionate expansion may be expected in trade construction. Expansions would be definitely assured in this particular industry, were long-term rates of interest to fall during the period of revival.

BUILDING AND CONTRACTING.

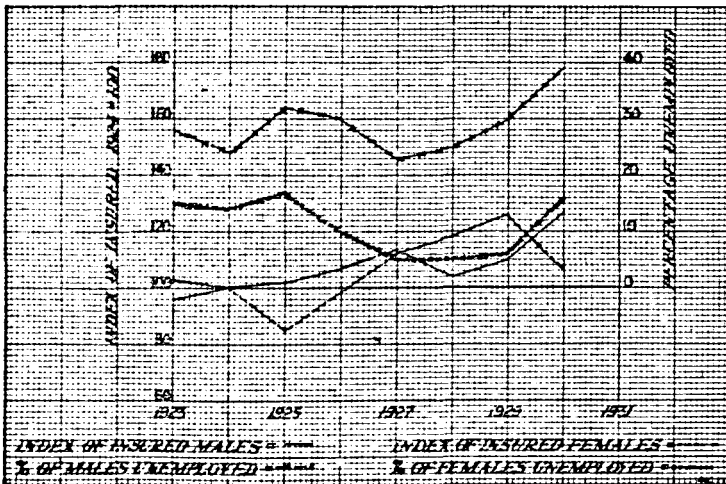
Index of insured persons and percentage unemployed 1923-30.

Males only.



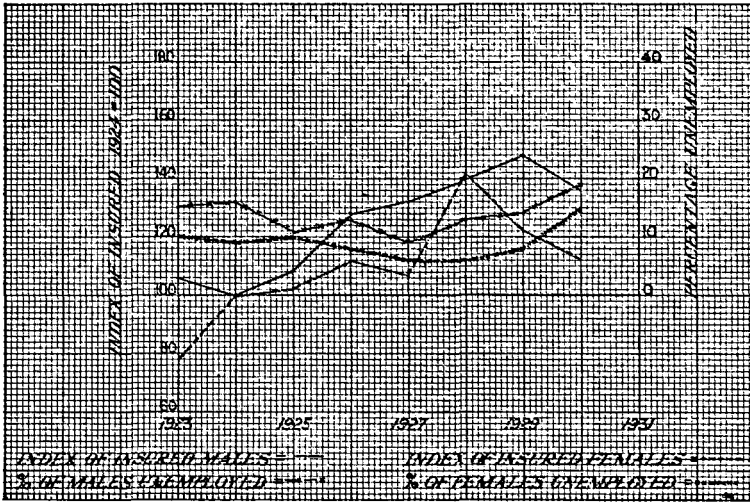
OILCLOTH, BRUSHES; WATCHES, CLOCKS, JEWELLERY; MUSICAL INSTRUMENTS; TOYS AND GAMES.

Index of insured persons and percentage unemployed 1923-30.



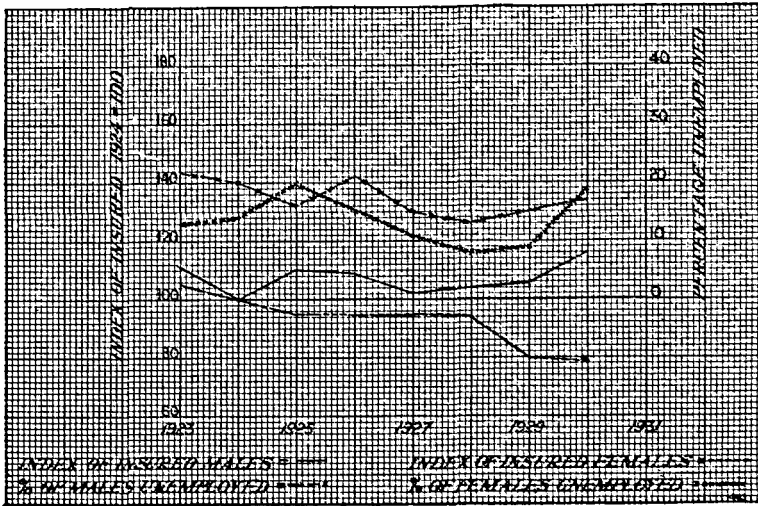
FURNITURE, UPHOLSTERY, ETC.

Index of insured persons and percentage unemployed 1923-30.



SAWMILLING, MACHINED WOODWORK ; WOODEN BOXES AND PACKING CASES ; OTHER WOODWORKING.

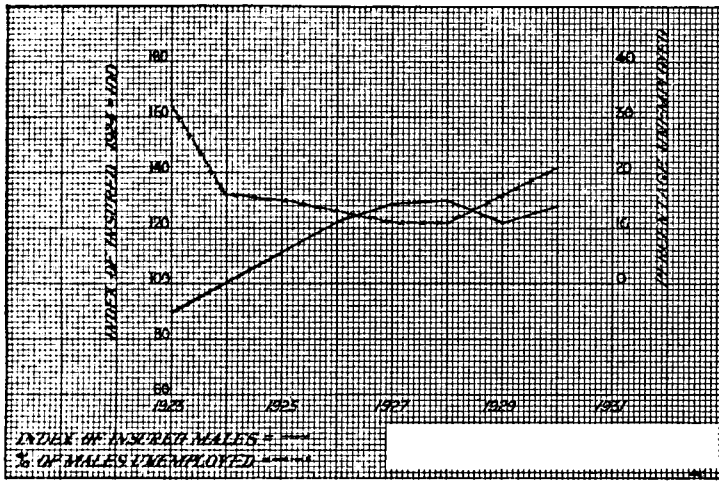
Index of insured persons and percentage unemployed 1923-30.



BRICKS, POTTERY, CEMENT; GLASS, ETC.

Index of insured persons and percentage unemployed 1923-30.

Males only.

**D. Manufacturing Industries.**

The Manufacturing industries of Merseyside employ altogether about 29 per cent. of the insured employed persons in the area. As a group they are therefore extremely important. Yet the largest industry in the group employs not more than 15,000 insured persons or about 5 per cent. of the whole on Merseyside. There are as many as 18 more industries having a normal employment roll of over a thousand.

The variety is extreme, Metal Industries working in the same area as Textiles; Cattle Food with Scientific Instruments; Soap and Oil with Cigarette and Rope production; Brass, Copper, Tin, Zinc, Lead, Rubber, Cotton, Silk, Wool, and general Chemical manufacture using the same docks as Food, Drink, Sweets, Toys, Jewellery, Stationery and Paper manufacture.

Apart from the fact that they are all engaged in that part of the process of production which lies between the extraction of the raw material and the distribution of the final product—i.e., the part termed "manufacture"—no distinguishing feature can be found common to the group. They are not a group in any sense beyond their association with the same phase, or cross-section, of the productive process.

Hence, in order to give a picture of this branch of Merseyside activity, it will be necessary to consider it in small divisions and give a separate account of each. In the ensuing pages, a brief statement will be made of the changes which have taken place in four main sub-divisions—(1) Metal Industries and Engineering; (2) Food, Drink and Tobacco; (3) Textiles; and (4) Miscellaneous; Oils, Soap, Chemicals, Rubber and Paper manufacture.

Thereafter, in a concluding note, some suggestions will be given as to the prospect of recovery of Manufacture as a whole; and recent evidence will be given of new development and of the advantages offered by Liverpool for the establishment of new industries.

Metal Industries and Engineering.

(i) General Position.

Under the general title "Metal Industries and Engineering" may be included the associated trades of Metal work proper, *i.e.* the manufacture, melting, rolling, and working of all metals; Constructional and General Engineering; the various Electrical Industries; and the Construction and Repair of Motors.

The group, thus composed, employs on Merseyside about 6.3 per cent. of the insured employed population; the first three of the above sections number nearly 6,000 each; and the fourth section, 1,700.

As a whole the group has considerably expanded since 1924, mainly due to the development of the Electrical Industries, which include Radio and the production of domestic electrical apparatus. The advance in these industries has been partly offset by a decline in Constructional Engineering and Repairs.

TABLE 5 (IV).

Incidence of Unemployment in Different Industries and their Relative Attraction for Labour.

Industry.	Numbers Insured in 1930.				Unemployment Index. (Mean 1923-1930.)		Index of Industrial Attraction. (Numbers Insured in 1930 relative to 1924.)			
	Men.	Boys.	Women.	Girls.	Males.	Females.	Men.	Boys.	Women.	Girls.
Misc. Metal Industries	4,400	510	1,800	540	70	134	106	115	101	82
Electrical Industries ...	3,600	530	1,910	340	62	76	146	161	133	110
Engineering and Constructional Engineering;	5,600	560	770	130	98	161	79	79	85	—
Railway Carriage, Tramcar building.										
Construction and Repair of Motors, Cars.	1,630	250	150	—	64	—	81	96	—	—

TABLE 6 (IV).

Percentages Employed in each Industry by Sex and Age, 1924 and 1930.

Industry.	Numbers Employed in 1930.				Year.	Percentages Employed.			
	Men.	Boys.	Women.	Girls.		Men.	Boys.	Women.	Girls.
Misc. Metal Industries	3,520	440	1,390	500	1924	59	7	26	8
					1930	60	8	24	8
Engineering and Constructional Engineering.	4,400	500	580	110	1924	78	9	12	1
					1930	79	9	10	2
Electrical Industries	3,120	480	1,740	290	1924	53	7	34	6
					1930	55	9	31	5
Construction and Repair of Motors, Cars.	1,340	210	140	—	1924	81	11	8	0
					1930	79	13	8	0

Although the various sections of this group are mutually related, the progress of each is determined by factors peculiar to itself, and a true picture of the group is possible only through an examination of each section (see graphs, pp. 139-140).

(ii) *Miscellaneous Metals.*

This branch of industry, comprising Steel Melting, Iron and Steel Rolling, the manufacture of Brass, Copper, Zinc, Tin and Lead, Cutlery, Wire, Engineers' Tools and Apparatus, showed an increase in employment of 8 per cent. from 1924 to 1930. Accompanying this increase there was a more than proportionate tendency for new recruits to enter the industry, so that, at the end of the period, despite the expansion, unemployment was as high as 19 per cent.

Idleness in the shipyards and the fact that millions of tonnage is laid up has reacted on the steel industry, with the result that there is little demand for steel plates. With this slackness has come intensified competition from Japan and Belgium in the sale of crude steel. The market in India is said to have been damaged on account of the boycott, and in Australia and Argentina because of the adverse exchange and currency difficulties.

Foreign competition has increased in recent years, and Belgian steel, in particular, has been produced, it is reported, 5 to 10 per cent. below the British selling cost. The market for British output is being preserved only by rebate schemes and special agreements with engineering firms in this country and by sales at unremunerative prices abroad. The opinion of some producers, before this country went off the gold standard, was that a tariff of 10 per cent. would be adequate to safeguard steel. There was no unanimity on this point, however, among those in touch with the steel industry.

It has been suggested that considerable economy would be effected were there a centralised rolling arrangement whereby rollings of various sections would be concentrated at certain mills and the changing of rolls thus minimised. Moreover, the machinery of some sections of the heavy steel industry is said to be capable of improvement and modernisation, and of adaptation to a wider range of manufacture, when the customary market shrinks.

More favourable conditions are reported among other industries in the Miscellaneous Metals section. No depression is reported in Tin Smelting, where there is an almost complete absence of foreign competition. The export trade is said to be expanding and the number of employees engaged has increased. Since employment in this Metals group as a whole has expanded 8 per cent. from 1924 to 1930, it is evident that some industries in it must be sufficiently active to enable them more than to offset the misfortunes of the Steel Industry.

(iii) *Constructional and General Engineering.*

Owing to the large size of the individual contracts involved in Constructional Engineering, fluctuations in its activity tend to be very wide. Employment in this industry has been declining on the average since 1924; a sharp increase in unemployment in 1930 raised the percentage to over 20.

In many respects this industry resembles Building and is affected by the same types of influence. There are firms in the industry which depend almost wholly on work subsidised by the Government, and expect to be seriously damaged immediately their existing contracts on Merseyside are completed. Their position will then depend upon general business revival; and it is said that owing to the depth of the depression the revival will have to go a long way before such firms can embark on large capital expenditure.

Constructional Engineering is much influenced by conditions in the Steel industry. In so far as the difficulties of this industry drive down the price for steel, constructional works tend to benefit; yet stability of relationships between the two groups is considered to be equally as important as low steel prices, and continuous efforts have been made by the chief engineering firms to establish a permanent agreement with British steel producers. In recent years the agreement has taken the form of a rebate scheme under which firms which undertake to use *only* British steel in their constructional work receive a substantial rebate on the cost of the steel. The difficulties of firms which adhere loyally to the agreement are, however, great. It is said that, on the one hand, British mills sell steel abroad more cheaply than they sell at home, so that the British constructional firm is defeated by rivals overseas; and that, on the other hand, it is defeated in the home market by British engineers who refuse to join the rebate scheme and who use cheap foreign steel.

There is no question that the departure from the gold standard will colour the situation differently both for the steel industry and for the adherents to the rebate scheme. Automatically, the price of Belgian and other European steel increases 20 per cent. or more. The Steel Industry thus receives its safeguard. Loyal engineering firms are no longer ousted by those who use foreign steel, since that steel is no longer cheap. Abroad their contract prices fall by 20 per cent. in terms of foreign currency, and they thus tend to

recover foreign custom. The prospects both for steel producers and for engineering firms are therefore made substantially brighter by the recent reversal of the country's monetary policy.

(iv) *Electrical Industries.*

The rapid expansion of the Electrical Industries, marked by a 52 per cent. increase from 1924 to 1930 in the number of employed workpeople, is due very largely to the development of the Radio industry. The expansion has apparently been far from uniform throughout the group; for in spite of the general rate of growth there was still unemployment to the extent of 12 per cent. in 1930.

As might be expected, the "attraction index" for this group shows a high rate of recruitment, the new demand being largely for male labour. There appears also to have been some replacement of female by male labour during the period under review.

Wireless manufacturing is largely a seasonal trade carried on from August to March—a further important factor contributing to the 12 per cent. unemployment figure in 1930, since that figure is based on a June return. During the remaining months some firms employ only 50 per cent. of their full-capacity labour. It is thought that when the industry has had time to adjust itself to a demand whose fluctuations can be foreseen, it will be possible to eliminate seasonal unemployment by the development of associated lines of manufacture. The coming of television is expected to help in this as in the general expansion of the industry.

A further cause of the recent rapid development is said to be the efficiency of the hire purchase system; 50 per cent. of the output of some firms is marketed by this method. The administration of the hire purchase system has apparently become an independent profession; it is undertaken by specialised financial houses which assume all the risk, pay the ordinary wholesale price in a lump sum to the manufacturer, and collect the monthly payments from the consumer.

International competition has so far not seriously affected Merseyside wireless producers, though there is some fear of the invasion of home markets by Americans. The devaluation of the £ is thought likely to delay this encroachment. Likewise it will assist British producers to penetrate foreign markets. Tariffs have been to some extent an obstacle to foreign sales; but the chief barrier has been uncertainty about *patents*. Innumerable patents and royalty rights exist abroad, and the British producer has no knowledge of these until he is prosecuted for infringing them. It has been urgently recommended that the Department of Overseas Trade should publish a descriptive list of foreign patents affecting the Radio Industry, so that a more certain and vigorous policy might be pursued by British producers in promoting their foreign sales.

Another important section of the Electrical Industries group is the Automatic Telephone supply. The employment provided by this section has tended to remain fairly stable, since its custom

comes chiefly from Governments or other public authorities whose requirements do not vary widely. Some decline of trade may, however, be expected in the immediate future, owing to the financial embarrassments of many Governments, especially overseas. Other reasons for an expected fall in foreign demand are :—(1) the reduced purchasing power of currencies in Australia and New Zealand; (2) foreign control of capital resulting in the diversion of contracts from this country; (3) the desire of certain previously non-manufacturing countries to establish industries within their own borders.

Two cases have been quoted in which large sums have been spent by a British manufacturer in advertising new electrical or other domestic inventions and introducing them to British consumers, only to have their market stolen by foreign competitors who, being saved the initial cost of advertising, were able to sell at lower prices. The case for a tariff in such instances seems *prima facie* strong. Presumably, only a general tariff on all manufactures with relatively high British costs, would meet the requirement, since the degree of protection afforded to each industry could not easily be made to vary accordingly to the amount spent on advertising.

All factors considered, the prospects for the Electrical Industries are most promising. The year 1930 was one of intense general depression. The year 1924 was one of rising prices and trade recovery, unemployment in the country being at one period below a million. Yet, despite this general change, the Electrical Industries on Merseyside employed in 1930 half as many workers again as in 1924. The number was rather lower in 1931, the index being 143 relative to 100 in 1924. Early expansion is to be expected, however, with a recovery of trade. These are pre-eminently the days of electrification. Modern inventions, both for trade and domestic use, increasingly involve the introduction of electrical appliances and accessories, and new electrical machines appear almost daily on the market. Hence, whatever may happen to the rest of the business world, it may reasonably be predicted that the Electrical industries will prosper.

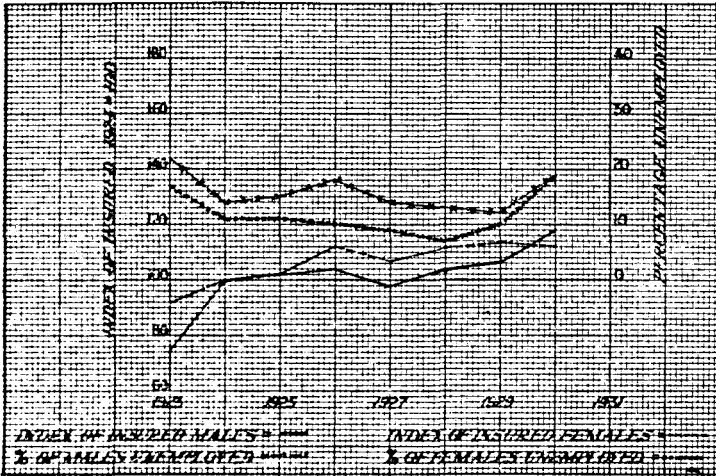
(v) *Construction and Repair of Motors, etc.*

Since only about one-tenth of the working force of the "Metal Industries and Engineering" group on Merseyside is engaged in the Construction and Repair of Motors and allied trades, changes occurring in the latter section do not much influence the trend in the whole group. The 15 per cent. decline in employment in this section, leaving 18 per cent. of unemployment in 1930, by no means offsets the strong advance made in Electrical Engineering.

Detailed information as to recent changes in the amount and character of the employment given in the Construction and Repair of Motors and allied trades is to be found in the graphs and tables appended to this memorandum. Similar details are given for each of the other three sections just examined.

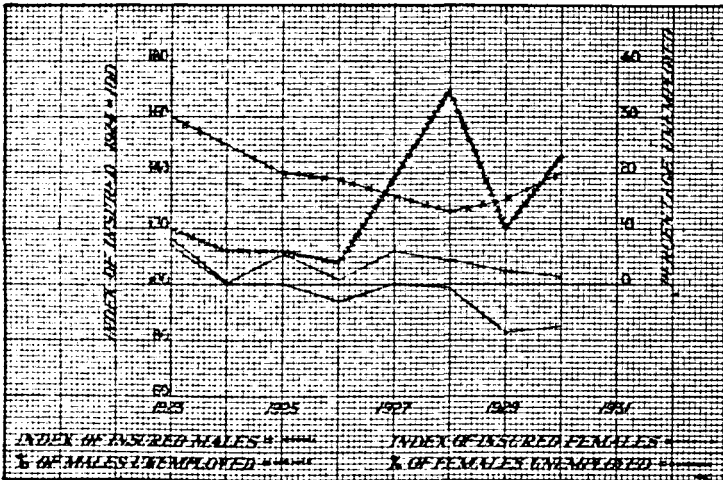
MISCELLANEOUS METAL INDUSTRIES.

Index of insured persons and percentage unemployed 1923-30.



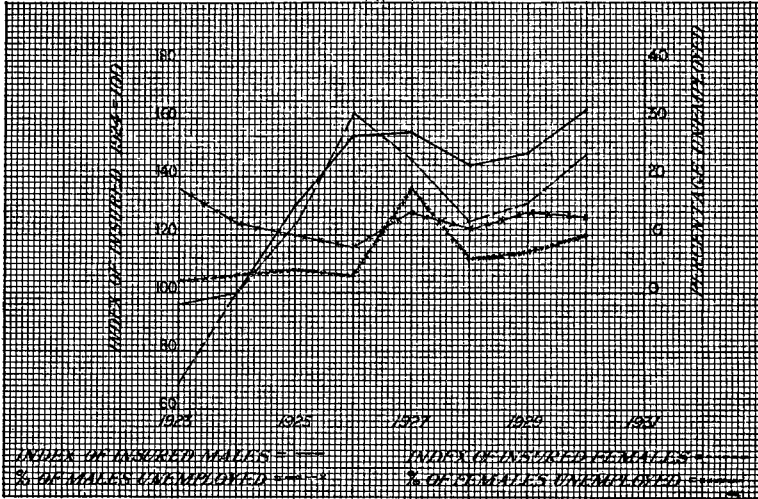
CONSTRUCTIONAL AND GENERAL ENGINEERING.

Index of insured persons and percentage unemployed 1923-30.



ELECTRICAL INDUSTRIES.

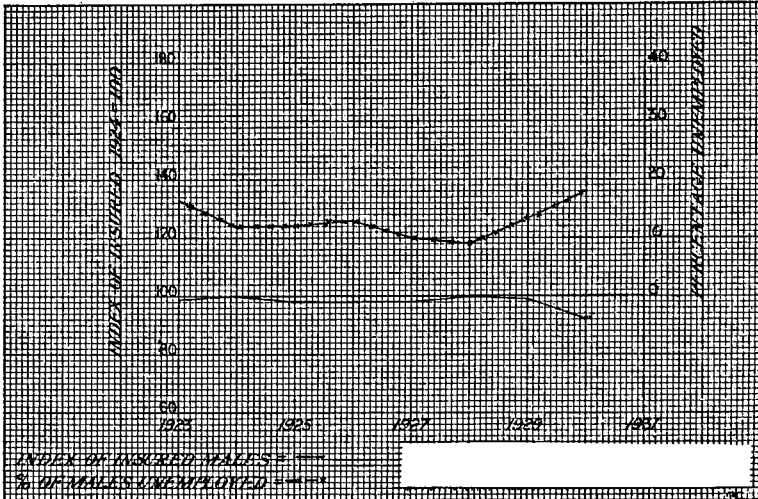
Index of insured persons and percentage unemployed 1923-30.



CONSTRUCTION AND REPAIR OF MOTORS, CARTS, ETC.

Index of insured persons and percentage unemployed 1923-30.

Males only.



Food, Drink and Tobacco.

(i) *General Position.*

The Food and Provision group of industries form an important section on Merseyside, employing nearly one-tenth of all the insured workers in the area. Numerically, the group is thus about as large as that of Building and Construction.

As might be expected in view of the inelastic demand for food and drink, these trades have shown little fluctuation, considered as a whole, during the period 1924 to 1930. The Bread, Biscuit and Cake industries had the same employment roll at the end of the period as at the beginning. And although there was a decline in the Drink and Confectionery trades, this was counterbalanced by an improvement in Tobacco and Milling.

Within the group there have been varying fortunes for the different sections owing to new habits of diet and changes in fashion. It is said that meat consumption is falling, whilst fruit is much more favoured. Bread is less used since the War, because the reduction of hours of work has made sandwiches for the working-man's breakfast unnecessary; the meal is taken at home. Confectionery is tending to replace bread, neither being now baked at home.

(ii) *Baking and Biscuit Making.*

Bakers say that their sales of biscuits have been reduced owing to distress in the coalfields where previously there had been a strong market. In the biscuit trade, moreover, competition from overseas is increasing. The manager of one large firm stated that there had been a growth in the demand for cheaper varieties of biscuit on the part of those who used to buy the more expensive. On the other hand, the introduction of new machinery had had the effect of bringing prices down. For this section of the food group, including the making of bread, biscuits and cakes, there was an unemployment percentage of 13 in 1930 despite the fact that no contraction in employment had occurred as compared with 1924.

(iii) *Sugar and Confectionery.*

Sugar refining and the various associated trades are flourishing on account of the special assistance given by the Government. The production of sugar is said to have increased by 2,000 tons per week since 1924, this expansion having indirectly favoured other local trades, since large quantities of coal, water and jute sacks are required in sugar production. Taking Sugar, Cocoa, Confectionery and Other Food together a decline of 7 per cent. in employment was recorded between 1924 and 1930. Unemployment rose rapidly in 1930, the average for the year being 21 per cent., an indication that these lighter foods are highly sensitive to fluctuations in trade.

(iv) *Milling.*

In Milling, employment capacity rose 7 per cent. from 1924 to 1930; but in recent months this industry has been severely injured by the dumping of foreign flour in Liverpool; it is stated that mills have been closed in Liverpool, Wrexham and Ellesmere Port.

TABLE 5 (V).

Incidence of Unemployment in Different Industries and their Relative Attraction for Labour.

Industry.	Numbers Insured in 1930.				Unemployment Index. (Mean 1923-1930.)		Index of Industrial Attraction. (Numbers Insured in 1930 relative to 1924.)			
	Men.	Boys.	Women.	Girls.	Males.	Females.	Men.	Boys.	Women.	Girls.
Bread, Cake, Biscuit making.	4,000	730	4,930	890	68	74	86	109	96	66
Sugar, Confectionery, Other Food.	4,850	190	4,150	920	50	171	90	53	95	96
Tobacco	1,790	110	4,050	790	27	79	122	—	91	73
Milling	2,820	200	660	50	58	89	97	93	125	—
Drink	1,820	100	870	70	58	149	70	—	93	—

TABLE 6 (V).

Percentages Employed in each Industry by Sex and Age, 1924 and 1930.

Industry.	Numbers Employed in 1930.				Year.	Percentages Employed.			
	Men.	Boys.	Women.	Girls.		Men.	Boys.	Women.	Girls.
Bread, Biscuit making	3,280	660	4,440	840	1924	39	5	45	11
					1930	36	7	43	9
Sugar, Confectionery, etc.	4,060	180	2,900	820	1924	52	3	37	8
					1930	51	2	37	10
Tobacco	1,700	110	3,650	780	1924	22	2	62	14
					1930	27	2	59	13
Milling	2,440	190	580	50	1924	79	6	14	1
					1930	74	6	18	2
Drink	1,560	90	680	60	1924	71	4	23	2
					1930	65	4	28	3

(v) *Cattle Food and Oilcake.*

In the Cattle Food and Oilcake industry, there has been a reduced demand for manufactured food stuffs owing to the fall in price of important raw foods such as maize. Farmers are making use of these raw materials dumped in this country at exceptionally low prices.

(vi) *Drink and Tobacco.*

The Drink trade has suffered most in this group, probably on account of the high level of unemployment in the area. It is interesting to note that whereas drinking has declined, smoking has

expanded. In the case of tobacco, however, the level of activity is not so much an index of demand on Merseyside as of a general demand over a much wider area. Some of the figures for this group may be seriously misleading if it is not borne in mind that the factories established on Merseyside are often branches of large firms serving the whole of the United Kingdom, and that the reason for their being in Liverpool is not that this area provides them with a market, but that it offers an excellent site for manufacture. This reservation is important in the consideration of industrial statistics embracing any firms with interests and customers in other parts of the country. The expansion in the Tobacco industry, measured by the number of insured employed, was 12 per cent. over the period reviewed. In the Drink Trade the decline was 23 per cent., affecting less than half as many workers.

(vii) *Movement of Labour.*

Further evidence of the movement of labour among these trades may be drawn from an examination of the graphs and tables appended. From the graphs of employment it will be seen that the group has not in general attracted to it large numbers of new recruits. Unemployment has been relatively small in each constituent industry except among women and girls engaged in the manufacture of Confectionery, Chocolate and Other Food, and in Drink. Where unemployment is low the numbers entering the industry might be expected to rise above the average; this is found to be so for men engaged in the manufacture of Tobacco and for women (700 only) attached to Milling; but elsewhere, either the conditions of employment have not proved attractive or, as a matter of policy, vacancies have not been filled by the management as they occurred, for the indices of industrial attraction are on the whole below normal.

There was a marked decrease in the number of girls seeking work in Bread, Biscuit, etc. making, and in the manufacture of Tobacco, from 1924 to 1930. Table 6 indicates that in the former trade girls and men may have been displaced to some extent by boys and women, whilst in the latter men appear to have displaced girls and women. In Milling and in Brewing, on the other hand, women appear to have taken the places of men.

(viii) *Rationalisation.*

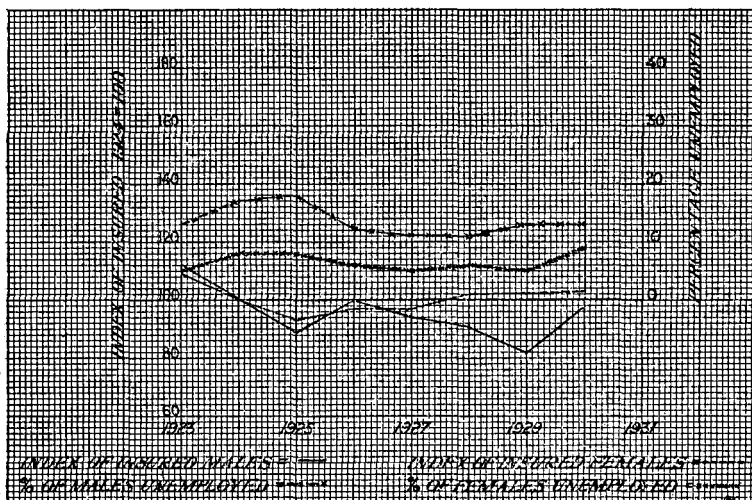
This group of industries is said to be one in which there is considerable scope for rationalisation and for the increased use of machinery. Already the process has begun in Milling, with unemployment as a consequence. One large firm in the area claims to have the latest and finest plant for Biscuit making that is available, and big improvements have been introduced in the machinery for the manufacture of cigarettes.

(ix) *The Future.*

In general, it may be said, that the Food and Provision Industries reflect, directly and sensitively, the movement of trade and employment over the area in which the industries are established, but that their fluctuation is never as extreme as that of average trade. Hence, just as the depression in these industries has been certain but not severe in 1930 and 1931 (relative to that experienced generally), their recovery will be equally certain but not extensive during any period of prospective trade revival. The industries likely to recover most are Confectionery, Cocoa and other light foods, and Drink. Flour Milling may continue in depression in view of the intensity of foreign competition; though, again, recent monetary events should ease the position for those mills which still remain in operation.

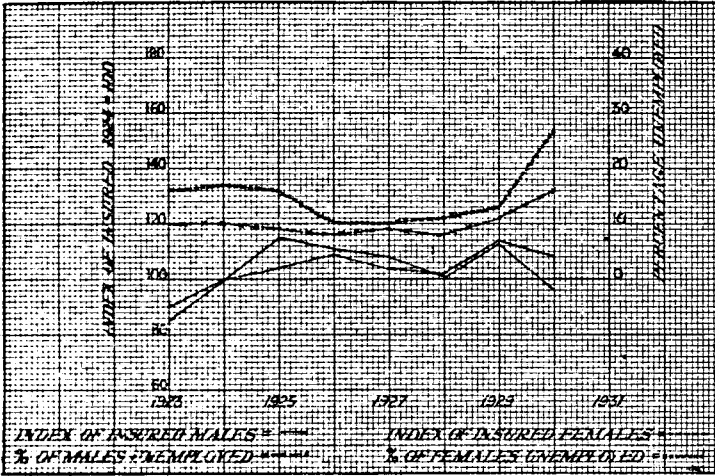
BREAD, BISCUIT AND CAKE MAKING.

Index of insured persons and percentage unemployed 1923-30.



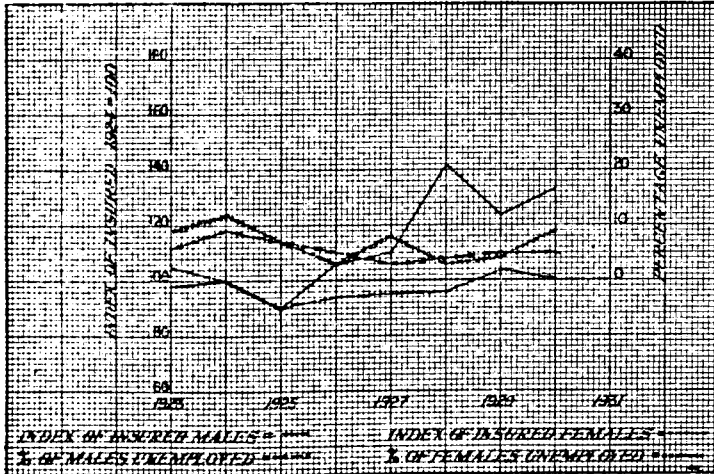
SUGAR, CONFECTIONERY, AND OTHER FOODS.

Index of insured persons and percentage unemployed 1923-30.



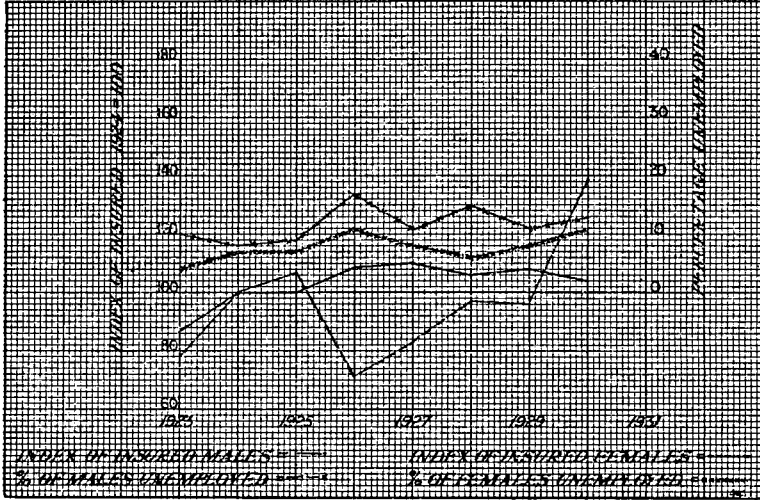
TOBACCO.

Index of insured persons and percentage unemployed 1923-30.



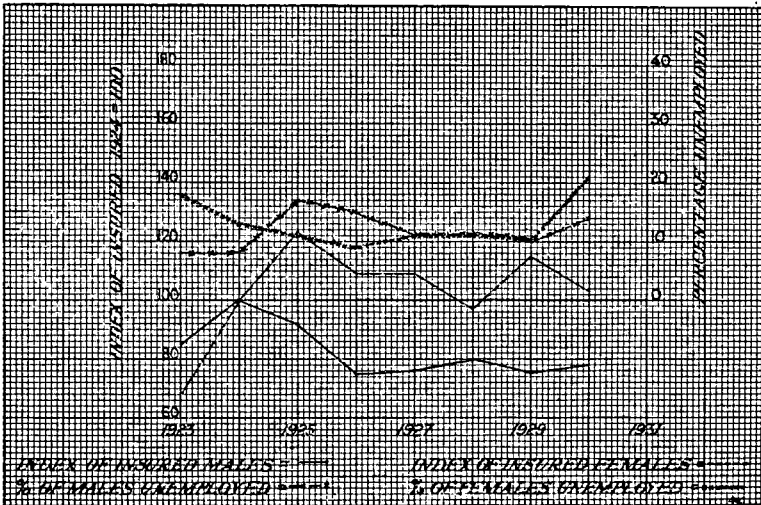
GRAIN MILLING.

Index of insured persons and percentage unemployed 1923-30.



DRINK.

Index of insured persons and percentage unemployed 1923-30.



Clothing Industries.

(i) *General Position.*

If artificial silk be excluded, the Clothing and Textile Industries have as a group suffered more severely than others among manufactures on Merseyside. Unemployment, in 1930, was as high as 21.0 per cent. for this group, even including the new silk industry.

It is difficult to discover causes, or factors, which may be termed "general," but a common feature among all the industries concerned appears to be the failure of their market to expand, coupled with intense competition both at home and from abroad to secure a share of this restricted market. The demand for clothing appears to be elastic in the sense that, when in depression incomes are reduced, expenditure on clothing is one of the first items for economy. Since, added to this, there is a widespread tendency to simplify clothing and produce ready-made wear by machinery, the difficulties of producers in this industry are abnormally great. With demand contracting, and output per man increasing, not only do profits dwindle, but unemployment enormously increases.

This indicates the general background in relation to which the various separate industries may be examined.

(ii) *Clothing.*

In the Clothing Industry there has been a steady continuous decline since 1925. Its staff of insured persons has since that year been reduced by about a quarter.

Here, especially, foreign competition has played a part in the decline of Merseyside enterprise. The home market is being gradually eaten away through the importation of ready-to-wear goods, at exceedingly low costs, from Germany, Poland, United States, Japan and Russia. Local buyers are reported to be developing an increasing bias in favour of foreign articles.

Thus, for this industry, regardless of changes which may take place in general trade, there are difficulties ahead. More important, perhaps, than the recovery of British trade, is the restoration of world markets, so that foreign producers may be no longer driven to sell here at distress prices. But in view of the depreciation of Sterling, the industry of this country is likely to recover in advance of, and partly at the expense of, world industry.

(iii) *Textiles (excluding Silk).*

Next in size in this group of industries is the manufacture of Textiles, employing about 3,600 insured persons. The plight of this section is even worse than that of Clothing. It has suffered, similarly, a steady decline since 1925; and in 1930 it had an unemployment roll of 31 per cent.

The depression in this group is no doubt largely due to the decline in Shipping and Transport, since the chief articles manu-

factured are jute bags and sacks used in the carrying trade. There appears to be little manufacture of textiles in the usual sense of the term.

(iv) *Leather Goods.*

Here again foreign competition is encroaching on a restricted British market. France, Germany, and America are reported to be selling boot leather here below the cost of production to British factories; and British factories are selling at between 10 and 12 per cent. below pre-war prices. Abroad, the French and American markets have been protected by tariffs, and therefore the British manufacturer cannot retaliate.

The competition strikes British leather production at two points. First, there is the invasion of the final market: the market for leather footwear, by Czecho-Slovakia in particular; and the market for canvas shoes, by Belgium and Japan. To the extent that these attacks drive the British boot manufacturer out of the market, British leather manufacturers suffer, since foreign boots are made of foreign leather. Secondly, there is the direct attack on the leather market itself. Here the chief rivals are Russians, who are said to be selling at about 10 to 25 per cent. below British firms. The position is so serious that one leather firm has stopped production and is buying and re-selling Russian rough and dressed calf. (All statements in this section refer to the period when the gold standard was still in operation).

One consequence of this severe and long-continued competition is that there is much excess capacity in the industry. One tanning yard capable of turning out 3,000 hides per week, completed in 1921, has never had a hide through it.

It is not surprising, therefore, that an unemployment figure of 19 per cent. is found in this industry in 1930. Although the industry has been adjusting itself for many years to an increasing foreign encroachment on the home market, the increase of unemployment to 19 per cent. is fairly recent. In 1928, unemployment was less than 10 per cent. for both men and women.

(v) *Artificial Silk.*

The one break in the clouds for this group of industries is the rapid widening of the market for artificial silk. Liverpool has shared the advantages of Lancashire in being chosen as a suitable base for the establishment of the silk industry. In 1924 there were no firms producing silk in this area; by 1930 there were two firms giving employment to 2,600 persons. Recruitment has been rapid, even during the depression; and in 1929 unemployment was at the relatively low figure of 8 per cent.

The Tables included below show that Artificial Silk has provided much new employment for women and girls, but that, in all the other industries comprised in this Clothing and Textiles group, women have been steadily replaced by men.

TABLE 5 (VI).

Incidence of Unemployment in Different Industries and their Relative Attraction for Labour.

Industry.	Numbers Insured in 1930.				Unemployment Index. (Mean 1923-1930.)		Index of Industrial Attraction. (Numbers Insured in 1930 relative to 1924.)			
	Men.	Boys.	Women.	Girls.	Males.	Females.	Men.	Boys.	Women.	Girls.
Clothing	1,560	180	3,100	810	56	61	83	54	63	78
All textiles (not Silk) ...	1,270	110	3,420	490	78	250	105	—	73	78
Tanning, Leather Goods ...	2,190	260	240	120	61	133	97	76	52	—
Silk	1,240	20	1,150	350	—	—	—	—	—	—

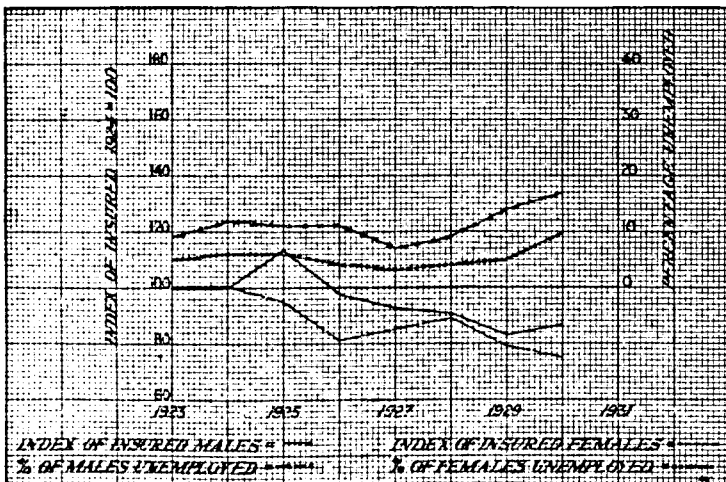
TABLE 6 (VI).

Percentages Employed in each Industry by Sex and Age, 1924 and 1930.

Industry.	Numbers Employed in 1930.				Year.	Percentages Employed.			
	Men.	Boys.	Women.	Girls.		Men.	Boys.	Women.	Girls.
Clothing	1,280	160	2,750	780	1924	22	4	62	12
					1930	26	3	55	16
All Textiles (not Silk) ...	1,060	90	2,000	430	1924	20	2	69	9
					1930	30	3	55	12
Tanning, Leather Goods ...	1,770	230	180	100	1924	72	11	15	2
					1930	78	10	8	4
Silk	970	20	890	320	1924	44	1	40	15
					1930	—	—	—	—

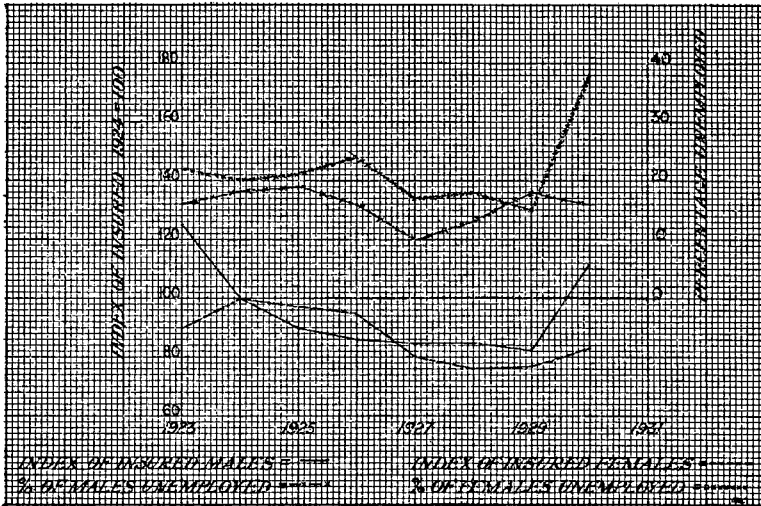
CLOTHING.

Index of insured persons and percentage unemployed 1923-30.



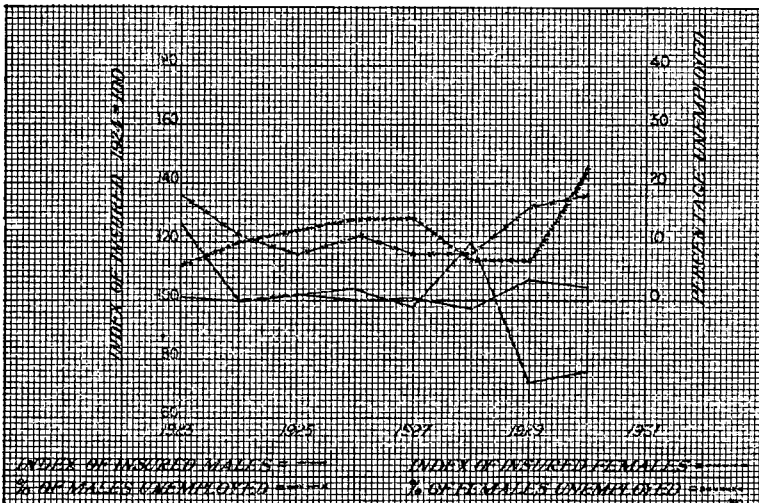
ALL TEXTILES
(not silk.)

Index of insured persons and percentage unemployed 1923-30.

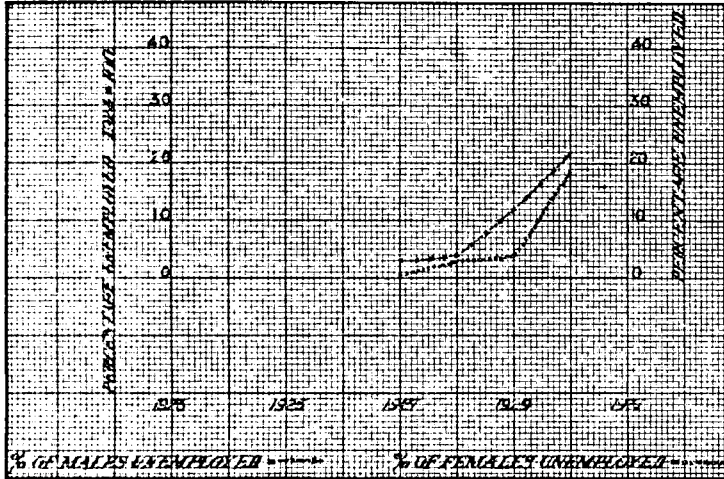


TANNING, LEATHER GOODS, BOOTS, ETC.

Index of insured persons and percentage unemployed 1923-30.



Percentage unemployed 1927-30.

**Miscellaneous Manufactures.**(i) *General Position.*

Nine per cent. of the total insured employed persons on Merseyside are occupied in manufacturing industries not so far considered. This remaining group comprises the production of Oils, Soap, Chemicals, Rubber, Printing and Paper, and other miscellaneous goods; some sections of the group may be interrelated, but there is no general distinguishing feature common to all. Hence we shall again be committed to a description of conditions industry by industry.

(ii) *Oils, Soap, Paint.*

The inclusion of Port Sunlight in the Merseyside Area makes the Oils, Soap and Paint group the most important under "Miscellaneous Industries." It employed 10,300 males and 4,200 females in 1930, of which nearly 500 were boys and over 800 were girls.

Unemployment was relatively low throughout the period 1924 to 1930, and at the end was only about 9 per cent. This small percentage was maintained despite a steady fall in the employment index, there being 5 per cent. fewer insured persons employed in 1930 than in 1924. The graph appended to this section shows especially a decline in the "attraction index" for females.

Probably the reason for the low figure of unemployment is partly that Lever's soap works have reached a stage of organisation similar to that of a Municipal Department or a Railway, and control the

recruitment of new labour rigorously so that the labour turnover is very slight and a reduced capacity for employment is met by a cessation of recruitment rather than by dismissals.

The decline in employment has been due probably to rationalisation, improved machinery, and, in general, scientific management. It may have been caused partly by the transfer of business from Merseyside to other areas either in this country or in Holland.

The future of the industry on Merseyside cannot be forecasted, since the amount of business undertaken here is determined arbitrarily by large combines whose operations are world-wide. An increase in general prosperity should enhance considerably the demand for oils, soap and paint, but it is not known how much of the greater demand will be supplied from Merseyside.

(iii) *Chemicals and Rubber.*

As in the case of Oils, and Soap, the production of Chemicals and Rubber Goods on or near this area is carried on by branches of firms having a much more extended market than the Merseyside-Lancashire area. In general, firms in this group are attracted here on account of the transport facilities and ample labour supply. Sea transport is essential to the development of a wide market when the materials used are great in bulk; and the ports in the neighbourhood of Liverpool provide a ready attraction for firms or branches of firms dealing in such goods as Chemicals and Rubber.

One disadvantage which a town may incur through being the home of local branches is that the activity of such branches may rise and fall more swiftly and to greater extremes than that of single independent firms. Single firms must keep producing at a relatively high level, or sink. Local branches of large firms may be used for specialised work producing at full capacity for a time, then lying idle. Temporary and permanent "shut-downs" are much more practicable to a firm with many factories than to single factory firms.

TABLE 5 (VII).

Incidence of Unemployment in Different Industries and their Relative Attraction for Labour.

Industry.	Numbers Insured in 1930.				Unemployment Index. (Mean 1923-1930.)		Index of Industrial Attraction. (Numbers Insured in 1930 relative to 1924.)			
	Men.	Boys.	Women.	Girls.	Males.	Females.	Men.	Boys.	Women.	Girls.
Oil, Soap, Paint, etc. ...	10,980	470	3,730	840	44	79	93	81	66	103
Printing ...	3,690	520	2,250	520	42	93	102	102	99	101
Chemicals ...	2,040	90	990	270	76	77	73	—	67	161
Rubber ...	1,000	80	1,140	340	85	113	183	—	133	220
Paper Manufacture, Stationery.	410	10	410	170	49	141	93	—	50	—

TABLE 6 (VII).

Percentages Employed in each Industry by Sex and Age, 1924 and 1930.

Industry.	Numbers Employed in 1930.				Year.	Percentages Employed.			
	Men.	Boys.	Women.	Girls.		Men.	Boys.	Women.	Girls.
Oil, Soap, Paint	9,890	460	3,340	820	1924	64	3	29	4
					1930	68	3	23	6
Printing	3,220	480	1,960	480	1924	54	7	32	7
					1930	52	8	32	8
Chemicals	1,680	80	900	250	1924	58	4	35	3
					1930	58	3	31	9
Rubber	830	70	930	320	1924	33	4	54	9
					1930	39	3	43	15
Paper Manufacture, etc. ...	370	10	290	150	1924	31	3	54	12
					1930	45	1	35	18

These considerations may to some extent account for the marked fluctuations in employment in the Chemical and Rubber Industries. In Rubber manufacture, in spite of an increase between 1924 and 1930 of 66 per cent. in the number of insured persons employed, there was a 16 per cent. unemployment roll at the end of the time. The graph given below shows exceptionally wide fluctuations in unemployment for the whole period among both men and women. In the production of Chemicals the variations are less extreme, but there was a decline of 16 per cent. during the period in the number of insured employed, and unemployment in 1930 was as high as 14 per cent. In both industries there appears to have been some displacement of women by men and girls.

Again, it is difficult to forecast the future of such industries, since much depends on arbitrary decisions unrelated to the local market or to general trends in trade.

(iv) *Printing, Stationery and Paper.*

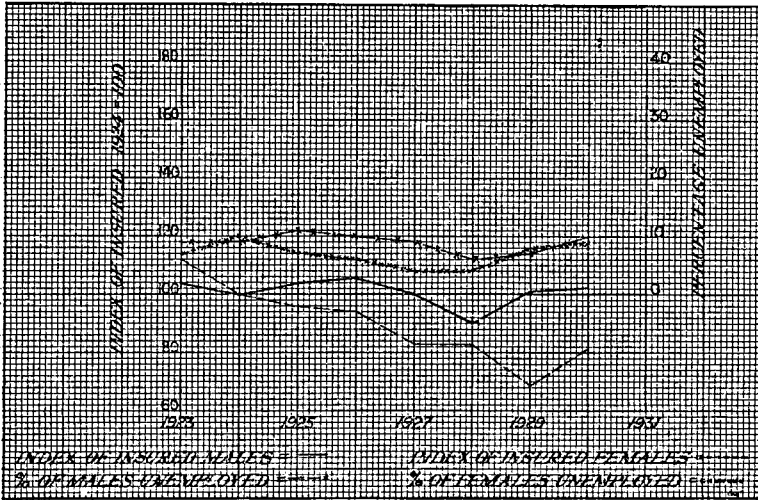
Firms engaged in Paper, Stationery, and kindred manufactures employ about 400 males and an equal number of females. Under this head comes the making of cardboard boxes, paper bags, cartons, wrapping paper, paper board as well as cheap envelopes, but there is little stationery in the ordinary sense of the term. There has been a great increase in the sale of cooked and other foods and confectionery neatly wrapped in cartons and sealed paper, which created a demand for such wrappings up to 1930. Among males there has been very little unemployment but there was a steep rise among females in 1930. Here again men and girls have to some extent replaced women.

A much more important industry numerically is that of Printing, which employs some 6,000 persons. Owing to the nature of the demand, activity in this industry tends to remain very stable. Both the local market, provided by newspapers and business, professional and social agencies, and the wider market, provided by publishing firms, tend to contract and expand only gradually. Thus it is found that employment increased steadily, though slowly, from

1924 to 1930, the increase for the whole period being 8 per cent. And until the last year in the period unemployment remained below 10 per cent.

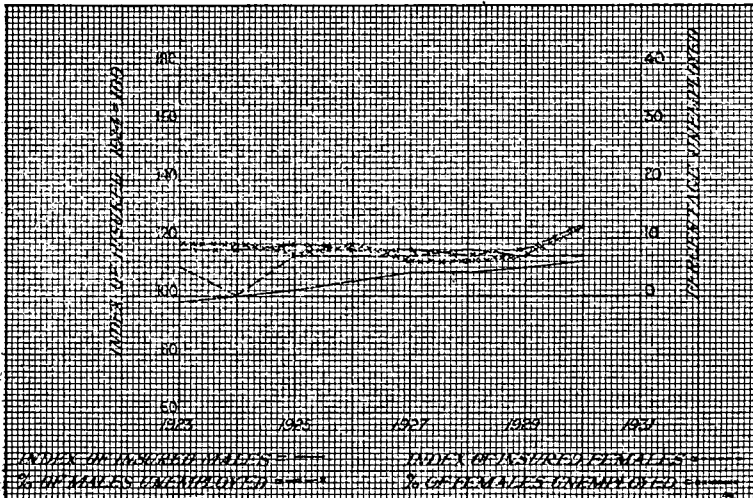
OIL, SOAP AND PAINT.

Index of insured persons and percentage unemployed 1923-30.



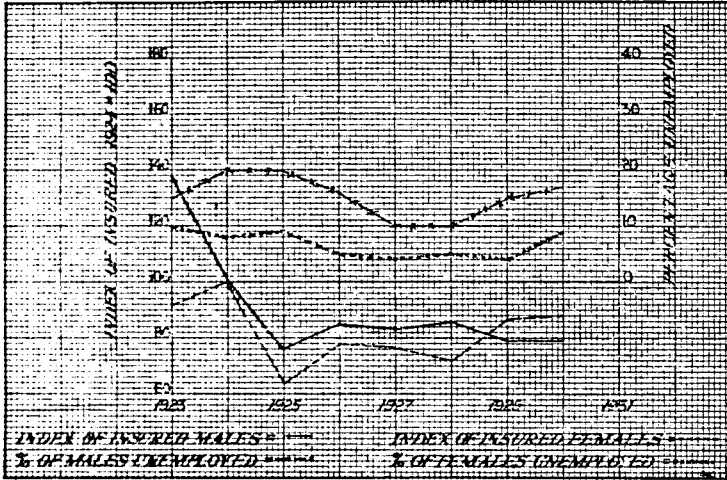
PRINTING.

Index of insured persons and percentage unemployed 1923-30.



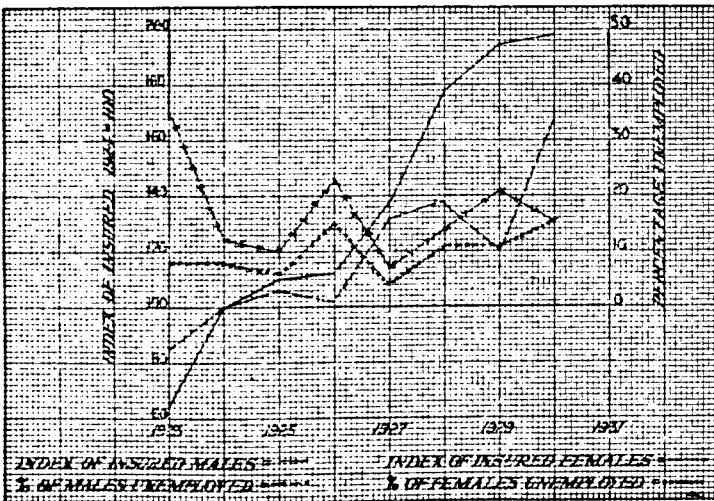
CHEMICALS.

Index of insured persons and percentage unemployed 1923-30.



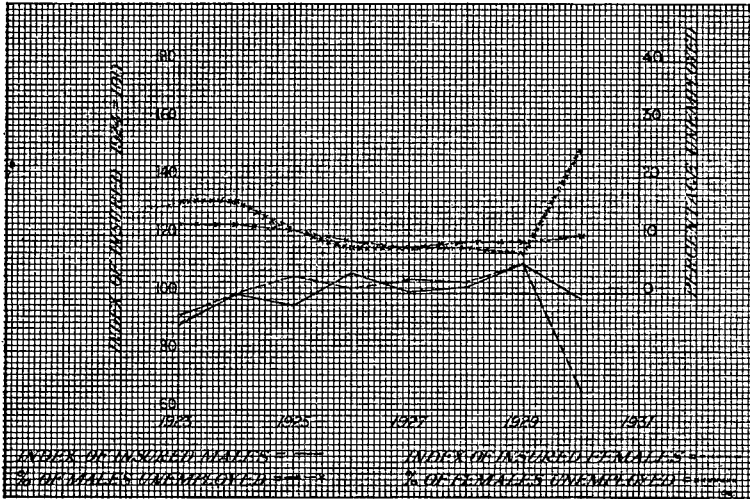
RUBBER.

Index of insured persons and percentage unemployed 1923-30.



STATIONERY AND PAPER MANUFACTURE.

Index of insured persons and percentage unemployed 1923-1930.



Footnotes to Part II. § III.

A. Shipping and Associated Industries.

- * Figures issued by the Mersey Docks and Harbour Board.
- † Based on figures given in the "Annual Statement of the Trade of the United Kingdom."
- ‡ Annual circular of the Liverpool Cotton Association.
- § "East India Wool Auctions," September series 1931, published by the Liverpool Wool Brokers' Association.
- || "Reports on Current Economic Conditions" (Royal Economic Society).
- ¶ Based on figures given in the "Board of Trade Journal."
- ** Figures provided by the Board of Trade.
- †† There has recently been an agreed reduction in the standard wage of dock labourers from 12/- to 11/2 a day.

Casual Labour at the Docks.

- * Report of Enquiry into Casual Labour in the Merseyside Area, p. 38.
- † Ibid. p. 44.
- ‡ Ibid. p. 51.
- § Ibid. p. 46.
- || Ibid. See graph opposite p. 62 of Mr. Hanham's Report.

B. Transport.

- * "Railway Returns" 1927, p. 209, and 1928, p. 119. Cotton conveyed at "Station to Station" rates only.
- † The figures were kindly supplied by the City Engineer of Liverpool.
- ‡ Ministry of Transport Traffic Census, 1928.

§ Ministry of Transport Traffic Census, 1925 and 1928 (quoted in "The Future Development of S.W. Lancashire". Regional Planning Report), Appendix C, p. 155.

|| Figures obtained from Ministry of Transport Traffic Censuses kindly supplied by Borough Surveyor of Birkenhead.

¶ These figures are taken from the "Home Market Analysis" (1931) of the Society of Motor Manufacturers and Traders, pp. 24-25.

** Royal Commission on Transport, Final Report, p. 83.

General, Government and Public Utility Services.

* During the years 1924 to 1928, inclusive, it appears that employees in the tramways service of Liverpool Corporation were incorrectly classified in the returns sent up to the Ministry of Labour and it is uncertain to which group they were allocated. The figures given, therefore, under the heading of Local Government and Public Utility Services must be accepted with caution, although it seems fairly clear that recently the number of workers in Gas, Water and Electricity has decreased while the number on Trams and Buses has increased through the development of motor bus transport.

C. Building.

* This is based on the returns supplied by the Divisional Office of the Ministry of Labour.

§ IV.

(1) **The Field for Expansion.**

One of the most pertinent replies to the enquiries made as to the future of Merseyside industry was that no forecast was possible on the basis of conditions prevailing locally. The causes of the depression here are at least nation-wide, and in some cases, international. The future of this area will depend on the power to reverse these causes. Liverpool is the highway between the North of England and the outside world. As such its prosperity is influenced by all factors that affect the flow of world trade: exchange rates, tariffs, banking policies, and international and political conditions.

Although, clearly, it is the Transport and Distribution services that are most dependent on this "flow" and on national and international policy, Manufacturing industries in Merseyside also reflect the wider policy and conditions. Substantially all the industries serve a much wider market than Merseyside itself, and it is not possible to predict the condition of these industries from factors affecting Merseyside only.

The most significant change in recent policy is, as has been shown in the discussion of the separate manufactures, the abandonment by this country of the gold standard. Among the export industries which directly benefit are Metals, Constructional and General Engineering, Electrical appliances, Oils, Soap, Paint, Chemicals, Tobacco and Textiles. Among the "unsheltered" industries competing with foreign imports direct advantage will accrue to Construction of Motor parts, Milling, Sugar, Biscuit and Confectionery, Clothing, Tanning, Leather, Artificial Silk, Rubber,

Stationery and Paper. The only firms which will not benefit directly are those which fall within the "sheltered" group of trades: e.g. Drink, Motor repairs, and Printing, but even these may expect to gain from the increasing activity around them. In general, therefore, given some improvement in world conditions, Merseyside manufacturing industries as a whole may look forward to a period of steadily advancing trade in which the field for new expansion will gradually widen.

(ii) New Industries.

It has been noted that, although no common feature can be found which distinguishes all the manufacturing industries on Merseyside, there are certain conditions in this area which favour the establishment of industries of certain types. Owing to the existence of sea transport, Merseyside is a peculiarly advantageous site for all firms which deal in heavy materials; port facilities such as it possesses are indispensable to such firms if they are to serve wide markets and compete effectively with foreign trade. A further important advantage is the high degree of mobility of labour in the area—a condition which yields two results. In the first place, new industries settling here can secure at once an inflow of workers of all ages and both sexes who, though not highly specialised, have been trained in various occupations and are able to adjust themselves comparatively quickly to new conditions. A second result is that the surplus of labour which is formed in periods of trade depression is a reserve for all industries in the area. If there is an unemployment problem, it is a problem for the whole enterprise of Merseyside. If there is a benefit from a labour reserve, it is a benefit which spreads to all firms and industries, old and new.

The new industries which have come into this region have thus selected it as a site because they produce heavy goods or need the services of a not highly specialised but adaptable labour supply. In round numbers, 70 firms, each employing 20 or more insured workers, have started on Merseyside since 1924 and still (1931) remain active. Of these about 60 firms, employing altogether 7,000 workers, are engaged in some kind of manufacture.*

The firms which provided most employment belonged to the Clothing group. They were 17 in number, and included two firms engaged in the production of Artificial Silk, which alone employed nearly 2,600 workers. The industrial group with the next largest number of firms (16) was Engineering and Metals, including the manufacture of Electrical appliances; but these were in general smaller in size, employing altogether some 1,000 workers, a total exceeded by about half the number of firms (9) in the Miscellaneous group, producing Oil, Paint, and Chemicals, Paper and Printing. Twelve firms in Building and associated industries and nine

engaged in the manufacture of Foodstuffs provided employment for 881 and 796 persons respectively.

The new firms which employed most adult males were classed under the following industries, in order of importance: Clothing, Miscellaneous Manufactures, Building and Associated Industries, Electrical and Metals; those which employed most adult females were classed under Clothing, Food, Electrical and Metals, Miscellaneous Manufactures; those which employed most juveniles were classed under Clothing, Electrical and Metals, Food, Building and Associated Industries.

In so far as the past can be a guide to the immediate future, it would appear that there should be further scope on Merseyside for the successful employment of women and girls in light industries such as the manufacture of foodstuffs and apparel. The expectation of probable openings on Merseyside is confirmed at several points by the answers received from firms in direct reply to enquiries. The possibility of expansion in Clothing and Textiles has been mentioned by several firms, though in this field it is evident that the present intensity of depression must temporarily place a check on development. The Boot and Shoe industry would be favoured, it was said, by the existence of tanneries in Liverpool. Furniture has been suggested by the managers of one or two multiple stores who point out that timber is one of the largest of Merseyside imports. New Hosiery and Millinery firms have prospered in this area. A ready market is said to be available also for printer's ink, cardboard and box material; the demand for boxes, in cardboard and wood, should be considerable in a distributing area.

As one evidence of the adaptability of Merseyside labour and enterprise, a firm whose main wares are polish, cleaning materials, etc., has successfully included the manufacture of toy tea sets in its field of production. Manufacturers of wireless and electrical components have similarly adjusted themselves to the changes resulting from invention and have steadily expanded. "Adaptability" is probably the keynote distinguishing both the labour and the capital facilities of the area. This is emphatically the opinion of the representative of a large new firm in the Artificial Silk industry, of whom special enquiries were made. The report from this industry is worth quoting, because it effectively summarises the considerations, favourable and otherwise, which on balance influenced the choice of Liverpool as a site:—

1. The existence of suitable buildings.
2. Ready access to raw materials, and the importation by water transport of wood pulp.
3. Proximity to the chemical industry.
4. The absence of auxiliary trades, such as the production of packing cases, owing to the insufficiency of local demand.

5. Labour not generally accustomed to factory conditions, but very adaptable.
6. The relatively high cost of labour.
7. An abundant supply of labour capable of being trained.

Great as are the natural advantages of Liverpool for many new industries, discrimination is needed in advertising its benefits. It was urged by one observer that it would be a mistaken policy to attract industries requiring highly skilled or highly organised labour here, since they would tend to add to the population without absorbing the class already present and in need of employment. The type of industry most desirable is that which will engage and train the large number of unspecialised workers already here. It would be peculiarly helpful if foreign industries which are contemplating the establishment of factories in England, on account of tariffs and the exchange position, could be attracted to Merseyside; but as a condition of their successful establishment, they should be of the type that is not dependent on great skill or specialisation. Similarly, Merseyside is an excellent site for branches of large decentralised firms, since, not only does it give every facility for transport, but it also provides a large market at the factory door and stands at the threshold of one of the most densely populated areas in the world.

Given also a national policy that will favour the exports of Northern England, and stimulate the production of textiles, coal and machinery, Liverpool should again be the busiest thoroughfare in this country. It offers exceptional advantages to all port industries and all industries requiring transport by sea.

Footnote to Part II, § IV.

* The figures relating to new firms have been obtained by analysing data received from the North Western Divisional Office of the Ministry of Labour based on the annual exchange of insurance books by firms on Merseyside. As all firms do not exchange these books in bulk the figures probably give a less favourable impression than the facts warrant.

§ V.—SURPLUS OF LABOUR.

(i) "Normal" Unemployment.

One question of considerable importance which we were asked to investigate was that of the surplus of labour in the Merseyside Area. To this question there are two parts: an attempt must first be made to estimate the normal labour requirements of industry in the area in order to get some idea of the present surplus; we must then enquire what are the prospects that the present surplus can be absorbed within the next few years. The estimate of the surplus is made in this section. The prospects of absorbing the surplus are discussed in § V of Part I of the Report.

In considering the principles which should govern the first estimate, it is relevant to point out that these Surveys are being conducted only in areas which are regarded as depressed areas. The presumption is that, apart from the recent world slump in employment which has been experienced by all districts and countries alike, conditions in other areas might be regarded as normal in comparison with conditions in those areas which are defined as depressed. If that be accepted, it is clear that we need only choose a really typical non-depressed area, and assess the labour requirements of different industrial groups there at a date prior to the incidence of the world depression, in order to have some kind of standard for measuring the surplus of labour on Merseyside. Now the area that most readily suggests itself, both by reason of its size and its relative prosperity, as suitable for this purpose is that of Greater London. As a striking proof of its prosperity it may be mentioned that the authors of the chapter on Unemployment in Vol. I of "The New Survey of London Life and Labour" come to the conclusion that "in the trades for which comparison can be attempted," unemployment in 1929 in London was "probably somewhat less and certainly not more than in the three years just before the War."* It is pointed out that the year 1913-14 was not a particularly prosperous year for London; nevertheless, even allowing for that, one can still safely assert that few large industrial centres could boast so good a record in 1929.

In the volume to which reference has just been made figures are given of insured and unemployed male workers in the chief London industries compiled from the records of the Ministry of Labour.† It has been possible to assemble these in groups corresponding to those defined in Tables 1 to 6 of this Report and then to find the percentage of males unemployed in Greater London in 1929 in each group. Figures for separate industries are not given for females in the Survey volume but, at the same period, only 3 per cent. of insured females in all industries combined were said to be unemployed.

It is suggested that under present conditions these percentages may be regarded, in most of the groups concerned, as the ideal minimum of normality. If a similar standard of employment could be achieved within a few years of 1931 on Merseyside there would certainly no longer be any justification for scheduling it as a depressed area. On the contrary, it may be argued, indeed, that industrially London is so particularly fortunate in many respects that the standard set in that neighbourhood of England in 1929 is too ideal to be practical for Merseyside; we require an upper limit of normality as well as a lower limit. A not unsuitable upper limit is provided by calculating the percentages of insured workers who were wholly unemployed in the same groups of industries in Great Britain and Northern Ireland.‡

TABLE 7.

Estimate of "Normal" Unemployment on Merseyside on the basis of that experienced in 1929 in

(A) Greater London and (B) Great Britain and Northern Ireland.

Industries associated with:—	"Normal" Unemployment Percentages.				Percentages in Previous Column applied to Insured Workers on Merseyside.				"Normal" Unemployment (Mean of A and B).	
	Males.		Females.		Males.		Females.		M.	F.
	A.	B.	A.	B.	A.	B.	A.	B.		
I. Shipping and Ship-building.	22·6	22·0	3·0	3·6	19,100	18,600	70	80	18,850	70
II. Transport and Distribution.	4·9	6·4	3·0	3·2	3,430	4,480	1,130	1,210	3,950	1,170
III. Building and Furnishing.	8·7	8·9	3·0	4·3	3,250	3,330	100	140	3,290	120
IV. Metals and Engineering.	4·2	6·4	3·0	4·4	740	1,120	180	270	930	230
V. Food, Drink, Tobacco.	4·6	6·3	3·0	5·3	790	1,080	510	910	940	710
VI. Clothing, Textiles	7·6	6·1	3·0	4·6	490	400	340	520	450	430
VII. Miscellaneous Manufactures.	4·0	4·5	3·0	3·5	740	830	340	400	780	370
VIII. General Service	5·1	6·1	3·0	4·3	1,700	2,030	510	740	1,870	630

In Table 7 are shown the percentages of unemployed males among all insured males in each industrial group in Greater London and in Great Britain and Northern Ireland, including, in the latter case, only males who were wholly unemployed or casually employed. § Corresponding percentages are given for females for the country as a whole, but for London the same percentage (based on all industries combined) is taken throughout. These percentages are applied to the totals of insured workers in each industrial group on Merseyside in order to arrive at an estimate of what might be regarded as "normal unemployment", i.e. the number of workers in each group who might be expected still to remain unemployed, even supposing that we could look forward within the next few years to a removal of both (i) the weight of international depression which affects all areas, and (ii) the more localised depression which has settled upon Merseyside in a peculiar degree.

On examining the percentages of unemployment in London and Great Britain one is struck by (1) the similarity of the A and B figures in the same groups, and (2) the very marked difference between the figures for males in Group I, and the corresponding figures in the other groups. As to this difference, Group I contains a large element of casual labour, namely, dockers, which is a very important element on Merseyside, and the figures deserve special consideration. ||

In view of the likeness between the percentages in the two areas adopted as upper and lower standards of normality it seems reasonable to strike an average between them in order to arrive at a

rough estimate of the numbers which we might expect to find unemployed on Merseyside, (1) in normal times and (2) assuming Merseyside was not a "depressed area". The result, defined as "Normal Unemployment" is shown in Table 7. The difference between the figures so obtained and the actual number of unemployed workers in 1931 will give the surplus of labour in each group. This surplus is shown in Table 8. We can then proceed to consider what part of this surplus is due to the recent international slump, and, having estimated that, the balance will be taken as the surplus due to those conditions which are responsible for the depression peculiar to Merseyside. The estimate of this latter surplus is one of the objects, and its existence is the only justification, of the present Survey.

(ii) Unemployment since 1929.

The additional unemployment that has arisen on Merseyside since 1929 may be taken as a rough measure of that part of the labour surplus which is due to recent developments as opposed to more purely local factors. When the figures are analysed on this basis (see Table 9) we find that, with some slight variation between different industries, the total surplus of labour due to the world depression is about twice the magnitude of that due to those conditions which have resulted in Merseyside being labelled as a "depressed area". Since Merseyside has only shared the experience of the rest of the country—and indeed the rest of the world—in its recent and most serious decline in employment, it is fair to assume that if the rest of the country, and the world, recovers, Merseyside should recover to the same extent. In that event the only labour surplus left would be the 25,000 odd workers peculiar to Merseyside. Moreover, one-third of this number is found in Group I, which includes dock labourers, a class which should receive special treatment. We are therefore left with some 17,000 workers in the remaining groups, and of these, again, one-third are to be found in Group II and over one-fifth in Group III.

(iii) New Entrants into Industry.

Having arrived at an estimate of the surplus of labour on Merseyside in 1931, and having examined its nature and its distribution over different industrial groups, the basis is provided for the discussion which concludes Part I of this Report. But one other rather serious matter remains to be considered. As the population of Merseyside expands, the number of newcomers seeking work also increases and more than counterbalances the number of elderly workers who retire to make room for them. According to figures based on estimates supplied to the Ministry of Labour by

Local Juvenile Employment Committees, the number of new entrants into industry over the five-year period 1932 to 1936 may be put down in round numbers as 51,700 boys and 41,800 girls in the four Boroughs of Liverpool, Bootle, Birkenhead and Wallasey, and the two Urban Districts of Waterloo and Seaforth and Bebington and Bromborough, which take in nearly the whole of Merseyside.¶ If at the same time we consider the number of occupied persons of both sexes who will reach the pensionable age of 65 during the same five years, basing our estimate on the Census of 1921, we have some 14,800 men and 2,600 women.** Hence, subtracting those who pass out of employment from the new recruits who seek to enter employment for the first time, we have an estimated net increase over the next five years in the numbers seeking work of 37,000 males and 39,000 females due to the growth and decay of population alone. These numbers together are about three times the total estimated surplus of labour (shown in Table 9) which differentiates Merseyside from areas that are not depressed.

TABLE 8.

Estimate of Labour Surplus on Merseyside in 1931.

Industries associated with:—	Numbers Unemployed in 1931.		Estimated Normal Unemployment.		Estimated Surplus of Labour.	
	Males.	Females.	Males.	Females.	Males.	Females.
I.—Shipping and Shipbuilding	43,400	440	18,850	70	24,550	370
II.—Transport and Distribution.	16,970	5,250	3,950	1,170	13,020	4,080
III.—Building and Furnishing	11,780	700	3,290	120	8,490	580
IV.—Metals and Engineering...	5,180	1,390	930	230	4,250	1,160
V.—Food, Drink, Tobacco ...	3,200	3,720	940	710	2,260	3,010
VI.—Clothing, Textiles ...	1,560	2,890	450	430	1,110	2,460
VII.—Miscellaneous Manufactures.	2,920	1,690	780	370	2,140	1,320
VIII.—General Service	4,850	3,780	1,870	630	2,980	3,150

In times past economists looking into the future would not have been alarmed by these figures; judging from their experience they would have said that new industries would arise and old ones would extend their operations in step with the increase in population so that all this new labour would be absorbed. But under present conditions one cannot regard such an influx of additional labour without some degree of dismay unless preparations can be made beforehand to provide it with work.

TABLE 9.

Analysis of Estimated Labour Surplus on Merseyside, 1931.

Industries associated with:—	Total Estimated Surplus of Labour.		Estimated Surplus due to Recent World Depression.			Estimated Surplus due to Local and other Conditions.		
	Males.	Females	Males.	Females.	Total M. & F.	Males.	Females.	Total M. & F.
I.—Shipping and Shipbuilding.	24,550	370	16,210	270	16,480	8,340	100	8,440
II.—Transport and Distribution.	13,020	4,080	8,160	3,120	11,280	4,860	960	5,820
III.—Building and Furnishing.	8,490	580	4,790	470	5,260	3,700	110	3,810
IV.—Metals and Engineering.	4,250	1,160	2,890	920	3,810	1,360	240	1,600
V.—Food, Drink, Tobacco.	2,260	3,010	1,390	2,370	3,760	870	640	1,510
VI.—Clothing, Textiles.	1,110	2,460	560	2,000	2,560	550	460	1,010
VII.—Miscellaneous Manufactures.	2,140	1,320	1,250	970	2,220	890	350	1,240
VIII.—General Service ...	2,080	3,150	1,710	2,360	4,070	1,270	790	2,060
	58,800	16,130	36,960	12,480	49,440	21,840	3,650	25,490

Footnotes to Part II, §V.

* The New Survey of London Life and Labour ; Vol. I, p. 353.

† Ibid. p. 356.

‡ The figures required for this calculation were taken from the Ministry of Labour Gazette. It seemed reasonable to leave out of account those workers who were only temporarily stopped because they could scarcely be regarded as surplus labour. In theory a certain proportion of them might be so regarded if the occasional work which all get could be replaced by permanent work for a portion of their number, but it is not a simple matter to organise work in such a way as to avoid any necessity for occasional employment. Moreover, granting that the omission of this group has the effect of reducing the apparent unemployment, there is a counterbalancing error on the other side, for whereas, in comparing Merseyside with London, we should be comparing a depressed with a singularly non-depressed area, in taking the whole country as a standard, unemployment will be somewhat exaggerated since Great Britain and Northern Ireland are made up of areas both depressed and otherwise.

§ The casually employed are not distinguished from the wholly unemployed for separate industries.

|| See Part II § III A, pp. 87-91. Although workers who are temporarily stopped are omitted in the determination of the percentages for Great Britain account is taken of casual workers both in Great Britain and in London.

¶ It has been assumed, on the basis of the experience of the Juvenile Employment Committees, that 90 per cent. of the boys and 75 per cent. of the girls attaining the age of 14 during the years 1932 to 1936 would be available for industry.

** It has been assumed, on the basis of figures obtained in a random sample of nearly 7,000 families in the course of the Social Survey of Merseyside, that 90 per cent. of males and 14 per cent. of females of age 60 to 64 are occupied.

§ VI.—SUPPLEMENTARY REPORT RELATING TO
MERSEYSIDE B AREAS.

(BARROW - IN - FURNESS, SOUTHPORT, ORMSKIRK,
FORMBY, HUYTON AND ROBY, ELLESMERE PORT.)

Insured and Employed Workers, 1923-1931.

The six areas covered by this section, defined as Merseyside " B ", have been treated apart from the rest of the district included in the Survey, because they fall outside the area defined as Merseyside " A " to which the main employment tables relate.

In discussing the employment figures for Merseyside " B " areas, only industries which are of some importance in one or more of the six areas are separately distinguished: the rest are lumped together under the heading " Other Industries." It will be possible to get a fairly satisfactory idea of the position in the chief industries in these combined areas if we compare the movement of their employment indices, referred to the year 1924 as base, with the movement of the corresponding indices for Merseyside " A ". The indices for the six combined areas are exhibited in Table 10 and the figures with which they are to be compared are given in Table 3 (p. 46). Where the movement is the same in character in both tables it calls for little comment, since what has already been said about conditions in Merseyside " A " will to a large extent be true for the neighbouring " B " areas.

Engineering.—This is the most important industry in the " B " areas, comprising nearly 10,000 employed workers in 1931 or more than twice as many as were employed in the same industry in the rest of Merseyside. Practically all were engaged in Barrow-in-Furness. The trend of the employment index has been more favourable than in the rest of Merseyside ending at 103 in 1931 as compared with 78 in the " A " areas.

Distribution.—Rather more than 7,000 insured workers were engaged in distribution, mostly in shops; over 4,000 were in Southport and nearly 2,000 in Barrow-in-Furness. The steady upward trend of this employment index has been almost parallel to that for the Merseyside " A " areas except that its recent rise has been somewhat more gradual. On the other hand the index rose in the " B " areas between 1930 and 1931 from 133 to 136, whereas in the " A " areas it fell from 150 to 140. There is probably not quite the same degree of competition for trade in the " B " areas as in the " A " areas.

TABLE 10.—DISTRIBUTION OF INSURED AND EMPLOYED WORKERS IN CERTAIN AREAS AND INDUSTRIES.

(AREAS : BARROW-IN-FURNESS, SOUTHPORT, ORMSKIRK, FORMBY, HUYTON AND ROBY, ELLESMERE PORT.)

Industry.	No. Employed in 1931.	Index of Employment (No. Employed in 1924=100).								
		1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.
Engineering	9,875	88	100	97	101	136	123	137	120	103
Distributive Trades	7,113	112	100	110	115	119	129	130	133	136
Shipbuilding	4,103	24	100	122	95	102	113	148	103	128
Hotels, Laundries, etc.*	3,680	99	100	115	107	109	115	115	118	117
Building	3,549	88	100	98	102	104	98	94	116	99
National and Local Government Service... ..	859	95	100	90	90	79	72	81	104	104
Motor Repairs and Manufacture	851	52	100	98	99	112	84	81	66	53
Coal Mining	582	152	100	123	202	102	81	84	60	83
Oils, Grease, etc.	560	9	100	94	120	172	210	232	258	245
Railway Service	461	76	100	94	86	94	82	80	85	42
Paper Making	458	101	100	106	102	106	114	116	112	100
Cement	404	76	100	111	93	87	92	82	89	85
Chemicals	389	160	100	103	86	88	111	147	302	280
Dock Service	381	83	100	125	165	149	129	112	106	126
Boots, etc.	366	91	100	132	111	165	179	197	204	196
Bread†	265	—	—	—	—	—	—	—	—	—
Cotton	219	97	100	96	71	112	105	121	103	116
Other Industries	8,925	100	100	108	99	100	94	98	92	98
Total	43,040	89	100	106	104	114	110	117	111	107

* Entertainments and Professional Services are also included in this section.

† New Industry in Ormskirk.

Shipbuilding.—This industry is confined entirely to Barrow, where some 4,100 insured workers were employed in 1931. Judging from the employment index there has been distinctly less depression in Barrow than there has been on Merseyside. Even in 1931 the index stood as high as 128 while on Merseyside it had fallen as low as 44.

Hotels, Laundries, Entertainments and Professional Services.—This mixed group of activities accounts for 3,680 persons in the combined areas, nearly all of them located in Southport. The index of employment rose from 100 in 1924 to 115 in 1925, then it declined somewhat until 1928 when it was back at the same level. By 1931 it had moved slightly upwards again to 117. The index in the "A" areas stood at 123 in 1931.

Building.—Over 3,500 insured workers were engaged in this industry, of which 1,570 were located in the area of the Southport Exchange, about half that number in Ellesmere Port, and rather over 1,000 elsewhere. The employment index has been less variable in these areas than in the Merseyside "A" areas, probably because building here is more dependent on private enterprise. The figure rose to 116 in 1930 but fell to 99 in 1931. In the "A" areas the index was 124 in 1931.

Taking other industries in the order of the number of insured workers for whom they provided employment in 1931, the index of employment rose between 1924 and that date from 100 to 104 for National and Local Government Service (859 workers); it fell from 100 to 53 in Motor Repairing and Building (851 workers); it fell to 83 for Coal Mining (Ormskirk: 582 workers); it rose to 245 for Oils, Greases, etc. (Ellesmere Port: 560 workers). All other industries employed fewer than 500 workers in 1931.

A few notes follow concerning conditions in Barrow, Ellesmere Port and Ormskirk, which are, industrially, the more important of the six areas defined as Merseyside "B".

BARROW-IN-FURNESS.

(i) Introduction.

Barrow is a well laid-out town with wide modern streets. It had a population of 66,000 in 1931 which was nearly 8,000 less than in 1921. The drop is due chiefly to the depression in iron and steel and shipbuilding in recent years, although it must be remembered that both these industries developed abnormally during the War. A gradual revival of the town's trade took place after the post-war slump, which affected Barrow seriously. The number of insured persons employed rose from 13,000 in 1923 to over 21,000 in 1929 since when the number has again fallen to about 18,000 in 1931. Barrow has suffered from its situation and distance from the industrial areas of the North of England. The road communications in particular are difficult. It is about ten

miles further from Preston by road than by rail. The main road to the North from Preston via Lancaster has been greatly improved in recent years but the branch road from Levens Bridge to Barrow—save at the Barrow end—is still far from satisfactory for heavy road traffic despite recent widening. A road to Lancaster parallel with the railway would be of immense benefit to Barrow.

There are complaints in Barrow of the lack of development of the docks. The increasing use of large vessels has made it impossible for many ships to enter at all tides over the sill. One big Oil Company is moving its oil tanks elsewhere at the present time for this reason. It is a common saying in the town that the dock walls are kept up by the weight of water within them and that they would collapse if it were removed. Local initiative created the Furness Railway Company which built the docks but, since the amalgamation in 1921, this railway is treated as a side line by the L.M.S. Had the docks been locally owned advantage might have been taken of the favourable terms offered by the Unemployment Grants Committee in 1929-31 to improve it, as was done at Workington by the Corporation and local steel company in co-operation. It is essential that the town should have satisfactory docks if it is to obtain new industries and allow a full development of its present industries.

Apart from these considerations the borough is efficiently managed. It provides cheap electric power which is used by all its industrial concerns. It is making strenuous efforts to obtain new industries and is prepared to offer particular facilities to new arrivals, but so far without success. Experience suggests that many foreign manufacturers making enquiries about factory sites in England are ignorant of the derating provisions and are therefore not attracted to the depressed areas.

(ii) Chief Industries.

Shipbuilding and Subsidiary Engineering.

Shipbuilding has certainly been more successful at Barrow in recent years than in other parts of the country. During the War the number of berths for ships was increased from seven to thirteen and at the present time five are in use. The yards were originally built for the mercantile marine but gradually began to specialize in naval work. Just before the War 99 per cent. of the work was naval. During the War the construction of army equipment and of merchant vessels was added to the naval work and the yards rapidly expanded. Realizing the difficult position which would arise after the War, a committee was appointed to draw up a programme of future development. Since the War a certain number of naval contracts have been fulfilled for foreign powers but other activities have

been more important. A large amount of mercantile work has also been secured.

There has been considerable development in general engineering too in the yards. Machinery for making cement, equipment for electric power stations, electrical winding machinery (for Rand, India and new British collieries), pumps (sixty-four for pumping Nile Delta just finished), cylinders for Bristol aeroplanes, Diesel engines and boiler, bridge and box making are all new forms of enterprise which have been undertaken since the War. The equipment in Barrow has been modernized during the depression and is ready for a trade revival when it comes. Expensive plant and highly skilled labour combine to produce work of exceptional quality which is a great asset in world competition. It would not in fact be remunerative to do unskilled work.

There is an open mind in Barrow upon the question of protection for the iron and steel trade. At the present time under an agreement only British steel plates, etc., are used although castings are still imported. It is pointed out, however, that shipbuilding is carried on in keen competition with foreign builders, and, if the cost of British steel is raised as a result of a tariff, orders from Chile, etc., would probably go elsewhere. It is stated that British shipbuilding has suffered from the strict enforcement of the Factory Acts, which has greatly added to costs, and from the subsidies given to shipbuilding by foreign governments such as Italy.

Iron and Steel—General Engineering.

A company owning several iron mines in Furness and Cumberland opened a blast furnace at Barrow in 1856 and 80 per cent. of the ore used in the making of iron and steel there still comes from the iron mines in the district; ores are only imported from abroad for the making of particular kinds of steel. Costs could be considerably reduced if work were more continuous (only five months have been worked out of the last eighteen). It was suggested that a tariff would increase output and reduce costs here, and, by decreasing the output of foreign steel manufacturers, it would raise their costs and so decrease their competitive power in the world market. It is doubtful, however, whether the costs of British steel could as a result of increased production be so far cut as to compete effectively with the present prices of imported articles. A further rebate scheme to encourage the export of highly finished steel goods on the lines of the present scheme for those who use only British steel plates and girders was suggested. It was argued that it would be greater economy to pay a little more for steel than to support a large number of unemployed workers. The railway companies are criticized for not being more forward in the adoption of steel

coaches. Since going off gold the industry has benefited greatly. Increased orders have been received from South America and from re-rollers in this country.

Other Industries.

Paper making is of some importance. Its employment figures have remained fairly constant over the last ten years. The number of railway employees fell by half between 1930 and 1931 owing to the closing of the local repair shops by the L.M.S. A part of the staff was removed elsewhere. The number employed in the distributive trades has risen steadily since 1923, the figures for 1931 being nearly double those of the former year. Other minor industries have declined. The jute industry, for example, has disappeared.

(iii) Barrow's Attitude to New Development.

As a progressive and up-to-date local authority providing numerous public services Barrow feels aggrieved that the Government should give subsidies to foreign firms and new industries to go to undeveloped areas in the South of England. Such subsidies take the form of official grants towards the building of new housing estates, schools, etc., in the new areas, without which industries would not be tempted to these localities. This assistance is paid for by taxation placed upon the whole country including the depressed areas. Such a policy is regarded in Barrow as a waste of national resources. If the Government is to assist in the work of national development it is suggested that new industries should rather be directed to suitable centres where schools, houses, roads, drains, etc., already exist and are not fully utilized.

ELLESMERE PORT.

(1) Introduction.

Ellesmere Port is a new industrial town, with a population of about 19,000, built at the point where the Manchester Ship Canal enters the Mersey estuary. Its chief advantage, as an industrial area, is, indeed, the excellent transport facilities it offers. It contains already rather more than a score of factories dispersed over a considerable area, and it found employment in 1931 for nearly 7,000 insured workers. There are still plenty of valuable industrial sites available near the Port and the Canal. The principal markets of the north and the midlands are very accessible; road and rail connections are good, and electrical power is to be obtained at a low price. The Stanton Oil Dock makes the locality especially suitable for oil refining.

(ii) Chief Industries.

The industries established in Ellesmere Port are exceedingly diverse in character, and at the present time almost every trade and factory alike is in a state of depression. Not more than 13 per cent. of the insured population were recorded as actually unemployed in June 1931, but several firms are stated to be on the verge of closing down.

The most important industry in the town is the *Manufacture of Steel Plates*, and the two great firms so engaged employ between them over one in three of the insured population. The larger of these firms is said to be working at about two-thirds of its capacity, and to be selling its products at a loss. A great part of the loss is in the export trade, and must be attributed to causes which the upward phase of the trade cycle will do little to remove. The chief customers in the past have been in Australia and South America, where the manufacture of steel plates is now being encouraged by high protective tariffs; India, where, too, with the aid of a duty the great Tata Steel Company has succeeded in capturing the market; and Japan, whose manufactures, again substantially assisted by tariffs, have replaced British products, not only in their own country, but in other markets of the East, such as Siam and the Dutch East Indies. To counteract tariffs, branch factories have been established by British firms in South America, but, while the advantages of this to Great Britain are by no means negligible, they naturally give employment to few British subjects. The remaining markets, where a good deal of steady trade is still retained, are South Africa, Denmark, Norway, Finland, and the smaller Baltic States. The departure of Great Britain from the gold standard, has, it appears, reduced British export costs in terms of Sterling approximately to the level of those of her chief competitors, but so far the visible effects on the export trade have not been substantial. Some fear was expressed lest any legislative measure should be taken to increase the price of steel bars, which represent the raw material of these firms, and it was stated that any tariff would have disastrous effects on this section of the industry at Ellesmere Port.

After Iron and Steel, *Building and Construction* employ normally the largest number of workers. Here again, trade is at present very slack. A large number of men are employed by a Public Works Contractor on work in the Port subsidised by the Government, but this contract will shortly be completed. The largest building firm has just gone bankrupt, and very little building is being done; it is hoped, however, that the Local Authority will shortly be in a position to negotiate a considerable housing contract.

Another important industry is that of *Oil Refining*, which is carried on by two firms, one of considerable size. Whilst this

industry is not unduly depressed, it reports little activity at present. Part of the by-products of the oil refineries is used by manufacturers of Road Surface Materials, who are anticipating a considerable reduction of production next year, as the result of economy in road construction and maintenance.

The *Docks and Canal Service* normally employ a large number of workers, but they, too, are comparatively idle at present.

One of the few industries in the town still producing at something like the normal rate is *Flour Milling*, which employs between two and three hundred workers. About a year ago, too, a large *Paper Mill* was set up, which is still active. Mention should be made of an *Aircraft Factory* which has been established two years at Hooton, near Ellesmere Port. Though the numbers employed are small, the factory has already made its name in the aircraft world. Butler's record-breaking flight to Australia was made with an engine from this factory.

(iii) Conclusion.

It will be seen that with very few exceptions the industries of Ellesmere Port are at present feeling the effects of the slump very severely. It will be noticed, too, that almost all these industries are engaged in the production of articles used by other manufacturers, whether at home or abroad, and consequently their prospects depend on conditions in other industries and in foreign countries. The only exceptions to the general tale of extreme depression are Paper and Flour Milling, which are industries producing articles of general consumption. There is little prospect of any of these industries being confronted, even in the event of trade revival, with an abnormal increase in the demand for their products; indeed, the steel trade seems unlikely to reach even the pre-1929 position. There is, therefore, no probability of any scarcity of labour in the area. For the ten years after the War there was an influx of labour here of some magnitude, although in certain trades, even in steel, an occasional shortage was experienced. The present supply, however, is likely to meet all demands for some time.

ORMSKIRK.

Ormskirk is a small country town in the centre of the intensively-farmed area of South West Lancashire. Since its absorption of Lathom and Burscough its population is 17,000. There are a number of small industries, of which Engineering (including a brass foundry) is the most important at Ormskirk, and an Ordnance Depot and Flour Mills at Burscough.

No important new industries have been established in recent years, and there is no sign of any industrial development in the near future. The only exceptions are sawmills, which are expanding considerably, and a chip-potato factory, which has not made much progress. Plans were made to start a canning factory, but they have not matured. The large market for potatoes, vegetables, fruit and eggs at Liverpool and Manchester, so close to the district, render a canning factory less advantageous here than in most areas of intensive cultivation.

Burscough is admirably situated for industrial development. Its transport facilities are exceptional. The Liverpool-Preston and Southport-Wigan railway lines cross here, and the Liverpool-Preston road, and the Leeds and Liverpool Canal both pass through it.

Gokhale Institute of Politics
and Economics, Poona 4.

BOARD OF TRADE
AN
INDUSTRIAL SURVEY
OF THE
NORTH EAST
COAST AREA

MADE FOR THE BOARD OF TRADE
BY
ARMSTRONG COLLEGE
(University of Durham)
NEWCASTLE-UPON-TYNE

Crown Copyright Reserved

2

X9.317.N3/4



LONDON
PRINTED AND PUBLISHED BY HIS MAJESTY'S STATIONERY OFFICE
To be purchased directly from H.M. STATIONERY OFFICE at the following addresses
Adastral House, Kingsway, London, W.C.2; 120, George Street, Edinburgh 2
York Street, Manchester; 1, St. Andrew's Crescent, Cardiff
15, Donegall Square West, Belfast
or through any Bookseller

1932

Price 7s. 6d. Net.

AN INDUSTRIAL SURVEY OF THE NORTH EAST COAST AREA.

TABLE OF CONTENTS.

	PAGE
Letter to the Right Hon. Walter Runciman, M.P., President of the Board of Trade	vi
Letter to the President and Council of Armstrong College	vii
REPORT :—	
i.—General Characteristics of the Area	1
ii.—Agriculture... ..	3
iii.—The Coal Mining Industry	5
iv.—The Iron and Steel Industry	11
v.—Engineering... ..	15
vi.—The Shipbuilding and Ship-repairing Industry	19
vii.—Heavy Chemicals	26
viii.—The Printing and Allied Trades	27
ix.—The Building and Allied Trades	29
x.—Food, Drink, and Tobacco Trades	31
xi.—Minor Industries	33
xii.—Transport (including Shipping)	35
xiii.—Public Utilities	40
xiv.—Distributive Trades	42
xv.—Labour	44
xvi.—Effects of the Suspension of the Gold Standard	49
xvii.—The Prospects of the North East Coast Area	51
MEMORANDA :—	
I.—THE GENERAL CHARACTERISTICS OF THE NORTH EAST COAST AREA—MR. G. H. J. DAYSH.	56
II.—THE NATURAL RESOURCES OF NORTHUMBERLAND AND DURHAM—PROFESSOR H. G. A. HICKLING	70
III.—AGRICULTURE—MR. D. H. DINSDALE	76
IV.—THE COAL MINING INDUSTRY—MR. E. D. MCCALLUM:	
i.—Introductory	91
ii.—The pre-war and present position of the Industry	92
iii.—Employment and Unemployment	94
iv.—Factors affecting the situation	102
v.—Measures adopted by the Industry	107
vi.—Prospects of the Industry	117
vii.—Future labour requirements	121
V.—THE IRON AND STEEL INDUSTRY—MR. E. D. MCCALLUM:	
i.—Introductory	122
ii.—Pre-war and present position of the Industry	123
iii.—The position of the Industry 1923-31	124
iv.—Factors affecting the Industry	129
v.—The efficiency of the Industry	130
vi.—Prospects of the Industry	132
vii.—Future labour requirements	133
VI.—THE ENGINEERING INDUSTRY—MR. E. ALLEN:	
i.—Statement of Trades covered and their Distribution in the Survey Area	134
ii.—Employment and Unemployment; the Survey Area and the depression	136

	PAGE
iii.—New firms started and old firms closed down	153
iv.—Production	158
v.—Foreign trade : Imports, Exports, the Trade of the Tyne	165
vi.—Finance	177
vii.—A more detailed study of the five main Engineering Trades :—	
(a) Introductory Note	178
(b) General Engineering	178
(c) Electrical Engineering	191
(d) Marine Engineering	193
(e) Constructional Engineering	196
(f) Stove, Grate, Pipe, and General Iron Founding ...	198
viii.—The problem of Labour Redundancy reviewed	200
Appendix A.—Statistical tables	202
B.—Note relating to Electrical Engineering ...	221
VII.—THE SHIPBUILDING AND SHIP-REPAIRING INDUSTRY—PROFESSOR H. M. HALLSWORTH :	
i.—Introduction	222
ii.—Position of British Shipbuilding since the War	223
iii.—World Shipbuilding	225
iv.—British Shipbuilding	226
v.—North East Coast Shipbuilding	228
vi.—Tonnage built for British and Foreign Owners	232
vii.—Changes in the size of Vessels	233
viii.—Capacity of the Shipbuilding Industry on the North East Coast	238
ix.—Warship Construction	241
x.—Ship-repairing	243
xi.—Changes since 1930	245
xii.—The financial position of the Industry	249
xiii.—Foreign Competition	249
xiv.—Research in the Industry	250
xv.—Post-war changes	252
xvi.—Specialization	253
xvii.—Probable future demand	254
xviii.—Rationalization	264
xix.—Labour in the Industry	267
xx.—Future demand for shipyard labour	271
Appendix—Statistical tables	274
VIII.—(a) THE ORGANIC CHEMICAL INDUSTRIES—PROFESSOR G. R. CLEMO	295
(b) THE PROSPECTS OF THE CHEMICAL INDUSTRY ON TYNESIDE—PROFESSOR H. V. A. BRISCOE	299
IX.—THE PRINTING AND ALLIED TRADES—MR. J. PARKER :	
i.—Introduction	301
ii.—The present position of the Trades	302
iii.—Employment and Unemployment	304
iv.—Prospects of the Trades	310
X.—THE FOOD, DRINK, AND TOBACCO TRADES—MISS C. BRAITHWAITE AND MR. E. ALLEN :	
i.—Introduction	313
ii.—Bread, Biscuits, Cakes, etc.	315
iii.—Grain Milling	317
iv.—Cocoa, Chocolate, and Sugar Confectionery	318
v.—Food Industries not separately specified	321
vi.—Drink Industries	323
vii.—Tobacco, Cigars, Cigarettes, etc.	327
viii.—Salt	329

	PAGE
XI.—THE MINOR INDUSTRIES AND SERVICES—MISS C. BRAITHWAITE AND PROFESSOR H. M. HALLSWORTH :	
i.—The Glass Trades	331
ii.—The Pottery Industry	333
iii.—The Textile Industries	335
iv.—The Clothing Trades	337
v.—Leather and Leather Goods Manufacture	339
vi.—Metal Mining and Metal Manufactures: Lead, Tin, Copper, etc.	341
vii.—Saw Milling, Furniture Making, and General Woodwork	344
viii.—The Fishing Industry	345
ix.—Commerce, Banking, Insurance, and Finance	346
x.—Laundries, Dyeing, and Dry Cleaning	348
xi.—Hotel, Boarding House, Club, etc., Service	349
xii.—Other Manufacturing Industries, and Services not separately specified	351
XII (a).—TRANSPORT (INCLUDING THE SHIPPING INDUSTRY)—MR. C. S. MCLEOD AND PROFESSOR H. M. HALLSWORTH :	
i.—Introduction	353
ii.—Shipping—	
(a) Trade of the world, the United Kingdom, and the North East Coast Ports	353
(b) Shipping dealt with at North East Coast Ports	360
(c) The Shipping Industry	362
(d) Causes of depression	367
(e) Employment	367
iii.—Railways—	
(a) Traffic dealt with	369
(b) Present position	373
(c) Employment	375
iv.—Road Transport—	
(a) General	376
(b) Employment	378
Appendix—Statistical tables	380
XII (b).—WORLD'S DEMAND FOR MERCHANT SHIP TONNAGE — SIR WESTCOTT ABELL	394
XIII (a).—GAS SUPPLY ON THE NORTH EAST COAST—THE NEWCASTLE- UPON-TYNE AND GATESHEAD GAS COMPANY	397
XIII (b).—ELECTRICITY SUPPLY ON THE NORTH EAST COAST—THE NEWCASTLE-UPON-TYNE ELECTRIC SUPPLY COMPANY AND ITS SUBSIDIARY COMPANIES	400
XIV.—THE DISTRIBUTIVE TRADES—MISS E. F. STEVENSON :	
i.—Introduction	411
ii.—Employment and Unemployment	413
iii.—Organization	418
iv.—Expansion and Contraction	422
v.—Conclusions	426
XV.—LABOUR—MR. H. E. R. HIGHTON :	
i.—Changes in the industrial distribution of the population	429
ii.—Changes in the distribution of employment	442
iii.—Unemployment—Labour demand and supply, 1932-36	455
iv.—Mobility of labour	468
v.—Industrial relations	489
Appendix—Statistical tables	493

Armstrong College,

Newcastle-upon-Tyne.

28th December, 1931.

*The Rt. Hon. Walter Runciman, M.P.,
President of the Board of Trade.*

SIR,

By a letter from the Board of Trade dated the 25th March, 1931, the Council of Armstrong College, Newcastle-upon-Tyne, was invited to conduct an industrial survey of the North East Coast Area. At the same time, it was intimated that our enquiries should be directed towards the production of a report which should include :—

- (a) a survey of the present industrial position of the area :
- (b) the prospects of early expansion and new development, having regard particularly to new industrial developments within recent years ; and
- (c) so far as practicable, an assessment of the prospective employment capacity of the various industries in the area as a basis for an estimate of the volume of labour likely to be surplus to the requirements of individual industries within the next few years.

We now have the honour to submit the accompanying report on the above matters.

I have the honour to be,

Sir,

Your obedient Servant,

W. S. MARRIS,

Principal.

Armstrong College,
Newcastle-upon-Tyne.

28th December, 1931.

The President and Council of Armstrong College,

MY LORDS, LADIES, AND GENTLEMEN,

I beg to submit the accompanying Report on An Industrial Survey of the North East Coast Area, which the Council of the College asked me to undertake in March last.

In doing so I desire to acknowledge the great assistance I have received, first, from the members of the Staff of the department of Economics, Mr. E. D. McCallum, Mr. E. Allen, and Mr. H. E. R. Highton, and from a former member of Staff, Miss E. F. Stevenson; secondly, from my colleagues in other departments of the College, Professors Sir Westcott Abell, Hickling, Briscoe, Clemo, Thornton, Hawkes, Granville Poole, Mr. J. T. Whetton, Mr. D. H. Dinsdale, Mr. G. H. J. Daysh; thirdly, from Mr. C. S. McLeod whose services were most kindly lent to us by the London and North-Eastern Railway, and from Miss Constance Braithwaite, of Bensham Grove Settlement, and now of the University of Birmingham; and lastly, from past and present students in the department of Economics, Mr. J. Parker, Mr. E. Davison, Mr. S. R. Dennison, Mr. F. H. Telford, Mr. J. A. Jamieson, and Mr. R. E. Gray.

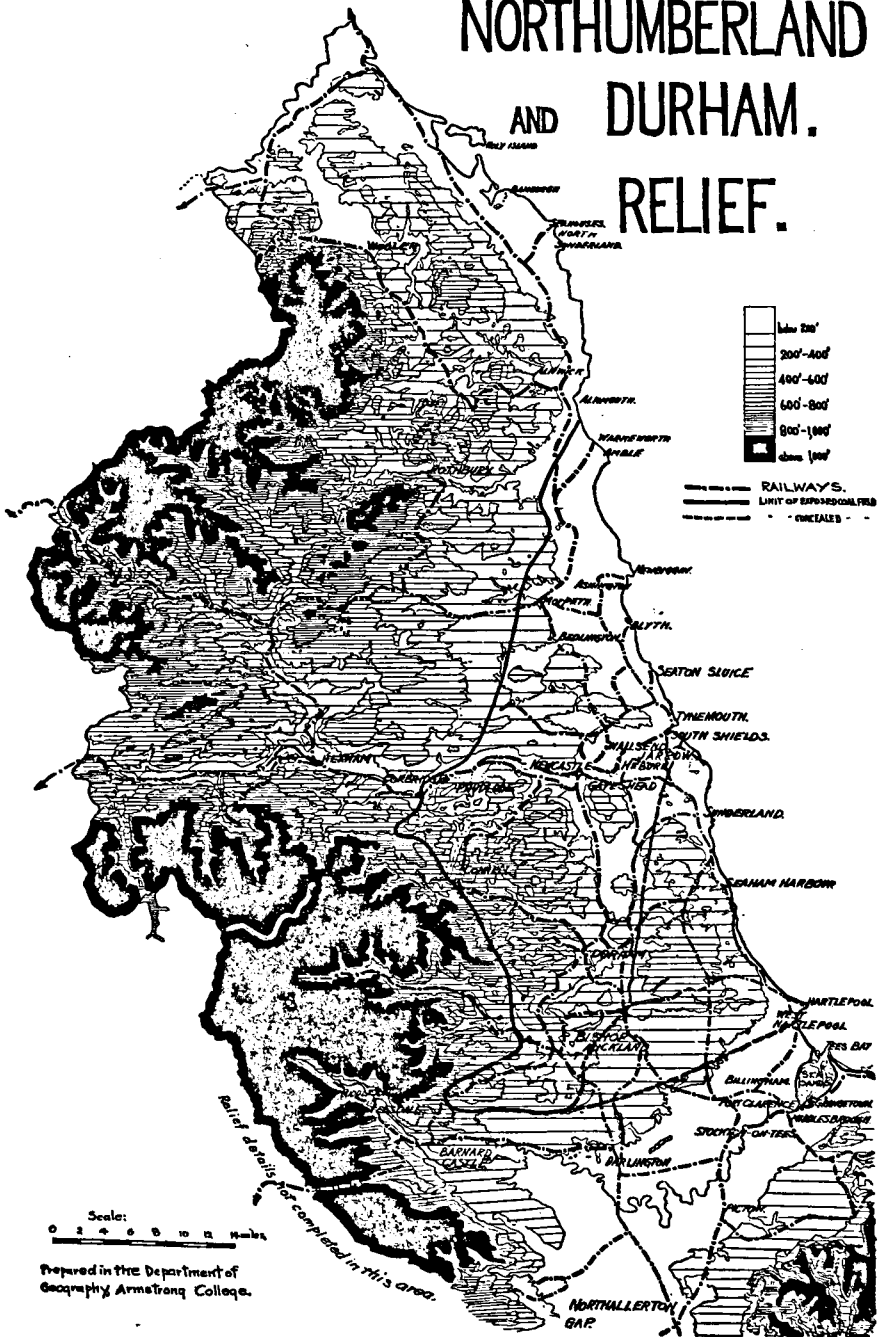
I am also greatly indebted to the many Associations and individuals connected with the industries of the Survey Area who have most willingly furnished me with information.

I am,

Your obedient Servant,

H. M. HALLSWORTH.

NORTHUMBERLAND AND DURHAM. RELIEF.



REPORT.

(i) General Characteristics of the North East Coast Area.

The North East Coast Area forms one of the most clearly defined geographic areas of the country. Its sea border consists of a hundred miles of coast between the high cliffs of the North Yorkshire moors and the limited stretch of plain overlooked by the Cheviots. Its inland boundaries are fixed by physical barriers, the North Yorkshire moors to the south, the Pennines to the west, the Cheviot country to the north and north west.

The geographical and geological features have been all important in the industrial development of the Area. There are three main gateways of communication by land. To the south is the Northallerton gap, through which movement has been easy and communications readily established with the Midlands and the South. There is no alternative economic highway by land from north to south along the East Coast other than by this gap. The main westerly route is through the gap of the Tyne valley, in the lower section of which the communications are highly important as links to colliery workings stretching up the valley. The northern gateway is that between the Cheviots and the sea. Between the Northallerton gap and the Tyne valley, crossings over the Pennines from the central part of the Area are few.

The coast is, generally speaking, a rocky one, and does not provide particularly good natural harbours for shipping. Each of the three great estuaries, the Tyne, Wear, and Tees, has had to be artificially improved to render it accessible and safe for modern shipping. South of Hartlepool the coast is lower, and it is here that we have the only considerable section of low-lying coast with plenty of poorish but level land suitable for factory sites. It is possible that this may have some bearing, as the special report on the geography of the Area points out, on its future development. But it is to be noted that it is a region of sand bars and mud flats, and that reclamation has been necessary in the past, and is still continuing.

The North East Area may be divided into four regions widely different in their character: (a) the moorlands and dales constituting the greater extent of the whole area, but having only a small proportion of the total population; (b) the region of the coal measures which is roughly triangular in shape, and is contained within lines drawn from the mouth of the Coquet to Hartlepool, thence to Woodland in S.W. Durham, and thence back to the mouth of the Coquet; (c) the Tees Valley, the most important agricultural region of the North East, though industrialised in its lower part; and (d) the Cleveland hill country.

It is the coalfield region which dominates the economic activities of the Area. The moorland and dale country is, by reason of its limited agricultural possibilities, a thinly populated region: but the industrial activities of the coal region have reacted upon it. Its limestone provides flux; its sandstone, road and building materials; and its agriculture supplies a part, though as yet only a small part, of the food supply of the industrial population. It is therefore a part of an economic whole.

The industrial geography of the coalfield region is of great importance. Though it forms only about a quarter of the total land area, it contains some four-fifths of the total population. The population is concentrated near the coast. The coalfield consists really of two sections, the surface coalfield, and the concealed coalfield. The latter is in the south east where Permian rocks cover the coal measures. The westward limit of these Permian deposits is indicated by a line drawn from the coast, just south of the Tyne, to Westerton Hill, east of Bishop Auckland. The maximum distance of collieries from the coast is only about 25 miles, and it is estimated that the average distance from pit to port is only about 10 miles. This fact is of the greatest importance to the economic welfare of the Area, since costs of transport from pit to port are relatively low. In this respect, at least, the coalfield is much better situated than, say, the Yorkshire coalfield. One difference between the surface and concealed sections of the coalfield may be noted here. In the former the workings are more widespread and many sections of it are exhausted. In the latter the borings are more concentrated, and the grouping of population is therefore closer at particular points.

The coalfields of Northumberland and Durham have been worked on an extensive scale for a longer period than any others in the country. Although the existing coal reserves are estimated to be sufficient to maintain the present output for a period of from 150 to 200 years, one must not overlook the fact that the best and most easily-won coal is very largely depleted.

Within the coalfield area industries based on the coal supply have developed. Within comparatively recent years a more distinct grouping of the iron and steel centres has taken place, but originally smaller centres were fairly widespread inland. Their situation, as at Consett, appears to have been governed in the first instance by local ore resources in the form of "black band" iron ores of the coal measures. But as demand increased this supply soon became exhausted. Some of these inland centres still survive probably because they are not far distant from the sea, and because of other advantages sufficient to offset the greater costs of transport. Such a centre of the iron and steel industry as that at Consett illustrates the close relationship of coal mining and the associated industries in a region where modern mining methods have

been evolved. In the main, however, blast furnaces are concentrated in the region about Middlesbrough, on Tees-side rather than on Tyneside where the ore is not present.

The degree to which the industries of the Area are linked together is shown by the distribution of the population. Of the ten towns in the Area with a population of 50,000 or over, only one, Darlington, is not a seaport. Three-quarters of the total population of the Area are clustered along the estuaries and the coast lands lying between them. It is in these regions therefore and not in the inland regions, with their more difficult and costly means of communication, that we must chiefly look for future developments of the industrial activity of the Area.

A significant factor in determining the competitive position of this Area relative to other parts of the country in the manufacture of commodities which require a national sale is the remoteness of the Area. The distance between Darlington and Leeds for example is 64 miles and there is no town of any significance, except York, in between. It is apparently cheaper to carry raw materials to more central positions and manufacture there than to manufacture in this Area and then carry the manufactured goods elsewhere. Such activity as has been developed would seem to have been dependent mainly upon easy access to raw materials locally won and on the nearness of the ports to Scandinavian sources of food supplies which has made this Area a food corridor to other areas.

On its geological side the Area possesses natural resources in Coal, Ironstone, Lead and associated ores, Road Metal and Building Stone, Clays and Refractory Materials, Limestone, Cements, Magnesia, Salt, Gypsum, and Anhydrite. These have been exploited to varying degrees and details of this are given later in the special memorandum prepared by the Geology Department.

(ii) Agriculture.

In the special Memorandum on Agriculture, attached to this Report, attention has been directed to certain features in the local agricultural situation which have a bearing on the demand for agricultural labour, to the exclusion of other matters on which we feel that the Ministry of Agriculture and the Board of Agriculture for Scotland already have ample information.

The main factors governing the agricultural demand for labour over the relatively short period since the Great War, may be stated as:—

- (a) the course of prices for agricultural products;
- (b) the consequent reactions upon the prevailing systems of farming in the area with which the Report is concerned;
- (c) the state of prosperity in the main industries of the Area which are the chief source of consumers' demand for the local agricultural output.

The position may be summarised as follows :—

(a) The prevailing type of farming—the mixed dairy and cropping farm—is a relatively intensive system giving a high rate of capital turnover, and catering for local demand for milk and dairy produce, mutton, poultry produce, and potatoes, and also supplying the needs of local industries (mainly collieries) for hay and oats. Barley and wheat are grown to a small extent as dictated by rotational needs.

(b) During the post-war period the prices of cereals have declined in greater ratio than the prices of livestock and livestock products, and consequently there has been a reduction in the arable acreage, accompanied by an increase in the number of livestock carried.

(c) Agriculture is an industry peculiarly susceptible to the depressing influences of a falling price level because of the long economic lag in production. The tendency induced by falling prices therefore, has been an increased emphasis on farming enterprises giving quicker capital turnover, viz. : milk production, fat lamb production, and egg production. The development on these lines is not to be interpreted as an indication of the absolute prosperity of these enterprises, so much as a choice of the lesser evil.

(d) While attention must be directed to falling price levels as the primary cause of the readjustments which are taking place, it has not been considered necessary to deal with the fundamentals in the price situation itself. The world-wide appreciation of gold and the disturbances arising out of post-war reconstruction are dealt with in the Report of the Macmillan Committee on Finance and Industry, and it is sufficient to stress here the peculiar susceptibility of British agriculture generally to the depressing effects of these factors.

(e) The increase in the number of livestock, especially of dairy stock, has enabled the agriculture of the Area to maintain the volume of employment at a level which compares very favourably with the level of agricultural employment in other parts of the country, and also within the Area in recent years.

(f) The number of *regular workers* engaged in agriculture in those districts where the mixed dairy and cropping farm is dominant (the major part of the Survey Area) shows a slight *increase* over the post-war years, while the number of *casual employees* has *declined*.

(g) In this connection the significance of the Agricultural Wages Committees on the one hand, and the customary long term wages agreements on the other hand, must be borne in mind. The former tends to stabilise the farm wages bill at a high level, while the latter compels the farmer to seek relief in

reducing the number employed, and casual labour is the obvious channel through which the burden of wages can be eased.

(h) A further point of significance is the exclusion of agricultural labour from the scope of the Unemployment Insurance Acts. No precise measure of the influence of this factor is available, but it is probable that it has a restricting influence on the recruitment of new supplies of labour in the industry, although, of more recent years, this tendency has been limited by the weakness of the general demand for labour in the Area. It has been limited also to some extent by the unwillingness of employers to turn off men for whom no alternative employment is available. The latter consideration might be removed if unemployment insurance were applied to agriculture.

(i) In the industrial area covered by the whole Survey there is, therefore, no serious problem of agricultural unemployment. The annual statistics summarised in the tables appended to the Memorandum show that the changes in farming systems, while involving a decrease in the arable acreage, have resulted in increased regular employment at the expense of casual labour. The future prospect must depend very largely upon the extent to which the prices of agricultural produce recover as a result of changes in monetary and fiscal policy, and also upon the extent to which consumers' demand within the Area is strengthened by improvements in the general industrial situation.

(j) The probable effects of the suspension of the gold standard are difficult to assess. Competitive imports such as eggs, bacon, cheese, and butter are not likely to rise much in price because the countries from which the bulk of the imports are purchased have themselves suspended the gold standard. Imported feeding stuffs on the other hand, have already risen in the order of 10 to 15 per cent. and it may be that, on balance, the final position of the farmer is not likely to be improved by the departure from the gold standard.

(iii) **The Coal Mining Industry.**

The coal mining industry is the most important single industry in the North East Area. At the 1921 Census 239,000 persons, or 6.5 per cent. of the 898,000 persons who were engaged in industry on the North East Coast in that year, were employed in the coal mining industry, and on the average of the five years 1923-30 (omitting 1925, 1926, and 1928) 224,000 persons, or 32.0 per cent. of the insured population, were recorded as attached to the industry. The Census of Production figures show that the value of the net output of all the trades of the North East amounted in 1924 to £85.5 million, and of this amount the coal mining industry contributed no less than £38 million, or 44.5 per cent. In brief,

approximately one-third of the occupied population of the Area is directly connected with the business of coal production, and the industry accounts for 45.0 per cent. of the value of the physical output of the Area. In 1921 according to the Census the proportion of the occupied population of Great Britain engaged in coal mining was 6.7 per cent.; in July, 1930, according to the Unemployment Insurance figures, the percentage of the insured population was 8.8. The North East Coast is thus much more dependent upon the coal industry than is the country as a whole.

On the average of the five years 1909-13 the joint output of the Northumberland and Durham section of the Northern Coalfield amounted to 54 million tons annually, or 20 per cent. of the average annual output of the country, while on the average of the five years 1925-30 (1926 excluded) it amounted to 48 million tons annually, or 19.5 per cent. of the country's coal production. Although the North East has thus maintained its position relatively to the rest of the country, it is producing on the average 6 million tons less per annum than in the pre-war years. In the meantime the world's annual coal production has increased from 1,078 million tons to 1,229 million tons on the average of these two quinquennia.

Before the War 21.1 million tons of coal were exported on the average each year as cargoes to foreign countries from the North East Coast ports, but in the 1925-30 quinquennial period the coal exports of the Area have declined to 18.3 million tons annually. Before the War about 3.6 million tons of bunker coal were sent out annually from the Area. In the more recent five-year period the quantity of coal so exported amounted to 3.4 million tons per annum. Thus the total decline in the export trade between the average of the pre-war and recent years amounts to practically 3 million tons per annum. Approximately 40 per cent. of the total production of the coalfield both before and since the War is used for bunkers and cargoes in the foreign trade. Since only about 20 per cent. of the coal production of the country is exported, it follows that the North East is much more dependent upon the export trade than is the country as a whole.

The decline of 6 million tons in the coal output of the Area is accounted for by a reduction of equal amount, namely, 3 million tons per annum, in the export trade, mainly to Russia, Germany, Sweden, Norway, and Denmark, and in the coal consumption of domestic industries. Since there has been an increase of nearly 2 million tons in the quantity of coal shipped coastwise from the North Eastern ports, it follows that there has been a decline of 5 million tons in the coal consumption of local industries. The decline in pig iron production probably accounts for not much less than 4 million tons of this amount.

In the years 1927-1930 the coal industry of the Area provided employment for three-quarters only of the persons who

were employed in it in 1924, and at July, 1931, only 54 per cent. of those who were at work in 1924 continued in the industry. In the period 1925-30 there has been a reduction of 30,000 in the average number of persons employed, as compared with the period 1909-13, and of 55,000 as compared with 1924, the year of maximum recorded employment. Further, although there has been a decline of 35,000 in the total number of persons insured in the industry between 1924 and 1930, unemployment in the industry has been marked, and in every year since 1924, except 1929, the percentage of unemployment in the coal industry has exceeded that of all the industries of the Area considered as a group. In 1931 although there are 41,000 fewer persons attached to the industry than in 1924, the unemployment percentage was 37.8 as compared with 3.9 in the earlier year.

The maximum post-war output for the North East Area was secured in 1929 and amounted to 53.5 million tons. It was obtained with 51,000 fewer workers than were employed in either 1923 or 1924, the post-war years in which coal production came nearest, but still appreciably below, the output of 1929. At the 1929 level of productivity an output equal to that of the maximum which the North East has ever obtained, namely, 56.4 million tons in 1913, could be secured by approximately 198,000 workers, and an output equivalent to that of 1924, a good average year and amounting to 50.4 million tons, could probably be obtained by 177,000 persons, or almost 63,000 fewer than the number actually employed in 1924.

The explanations of the changes in the course of production and employment, which have been recorded, are many. Up to 1924 the coal industry of the Area, in common with the coal industry of the country, benefited from the damage to French and Belgian mines, by the dislocation of German economic life during the last stages of currency inflation, and by the occupation of the Ruhr. Since 1924 the position has been reversed. The restoration of European economic life, the withdrawal from the Ruhr, the return to the gold standard, the domestic trials of 1926 and the effect of Polish competition in the Scandinavian markets, have worked together to eliminate the special advantages which the country and the Area enjoyed in the early post-war years. For a time in 1925-26 the difficulties of the situation were covered up by the operation of a Government subsidy to the coal industry. Since then, however, the industry has had to face the problem of re-adjustment to meet the new conditions, and to add to its difficulties it has had to bear a very considerable part of the burden which has affected the heavy industries of the Area almost continuously from then until the climax of economic and financial uncertainty in the autumn of 1931. Depression in local industries has affected the position of the mining industry. It appears that the industries of the Area have been consuming 5 million tons of coal less annually on the average of the five years 1925-30, than in the five years before the War, and about 1.5

million tons less than in 1924, the best year for employment in the Area since 1923. Even in 1924, however, the coal consumption of local industries was 3.5 million tons below that of the average of the five pre-war years. It is impossible to allocate quantitatively the decline in local consumption, industry by industry, but it is fairly certain that the reduction in the production of pig iron since the pre-war period accounts for the greater part, if not all, of the decline since these years. Since the production of pig iron has been as good on the average of recent years as in 1924, the decline in coal consumption since that year must be attributable to a reduction in the coal consumption of other industries including the coal industry itself. Again, the reduction in the volume of coal exports has been an important factor in the position. The decline in the export trade of the North East in recent years from the 1913 level is accounted for almost entirely by the disappearance of the Russian market and by the reduction in the quantity of coal exported to Germany and Scandinavian countries. The greatest single loss in the coal export trade of the North East is the disappearance of the Russian market, which accounts for a decline of about 2 million tons. The loss in the Scandinavian trade on the average of recent years, amounts to about one million tons, and is attributable entirely to Polish competition in these markets.

The decline of 5 million tons per annum in local coal consumption and of 3 million tons in the export trade has been compensated to the extent of almost 2 million tons in the quantity of coal shipped coastwise as cargo to the South of England, mainly for domestic purposes and for gas works.

The substitution of oil fuel for steam raising and for internal combustion engines, the stationary consumption of domestic coal despite an increase in population, the introduction of mechanical methods for the extraction of coal, and improvements in organization and marketing, have also affected the position of the industry in recent years. Further, in the course of the last few months of 1931 the international financial crisis and the suspension of the gold standard have reacted upon the industry. Opinion upon the effects of these developments varies. In spite of improvements in certain directions the effect on the whole appears to have been unfavourable. The crisis, by dislocating international trade, has worsened the position of the industry, while the favourable influence of the abandonment of the gold standard, in operating as a stimulus to the export trade, has been offset by uncertainties in foreign exchanges, by the suspension of the gold standard in other countries, especially in Scandinavia, and by the imposition of special countervailing imposts in others, particularly in France.

In order to maintain its place as a centre of coal production the coal industry of the Area has been compelled to effect reductions in the terms which it offers to its workpeople, but it has also had

resort to a variety of practices, designed to increase the efficiency of its working. A feature of recent changes in the structure of the industry in the Area has been the gradual concentration of production in fewer and fewer pits. The tendency has been towards the elimination of the poorer and less efficient pits and the concentration of production in the richer and more efficient ones, and in consequence the output per pit has been increased very considerably. Again, it appears that the rate of advance in the application of new technical methods in the mining of coal in this section of the Northern coalfield has been greater than that of the country as a whole. Particulars of these developments are given in the detailed memorandum on the coal industry.

Surprisingly little movement towards amalgamation and grouping has taken place in the coal industry of Northumberland and Durham. Neither the recommendation of the Royal Commission of 1925, nor the advice of the Coal Mines Reorganization Commission, seems to have convinced the colliery owners of the North East of the advantages to themselves and the industry to be obtained from amalgamations on a large scale.

According to the Royal Commission on the Coal Industry (1925) one of the weakest aspects of the organization of the industry was the method of marketing coal to consumers. The passing of the Coal Mines Act (1930) has made the adoption of uniform marketing arrangements compulsory. Although experience of the working of the Act is limited, complaints are frequently expressed about the effect of the scheme in restricting the output of coal and in increasing the effectiveness of the competition of other countries. Improvements in the technique of preparing coal for the market are being made in the Area. It should be observed, however, as is pointed out in the special memorandum on the Natural Resources of Northumberland and Durham, that the practice of mixing together the output of different seams of the same pit may restrict the effectiveness of the competition of the North East with those centres of coal production where the coal from each seam is marketed separately.

There are a considerable number of owners in the Area who are aware of the importance of research in the development of the industry, and in this connection no important aspect of mining practice appears to have been overlooked. Nevertheless, it is worthy of note that in 1926 the Royal Commission on the Coal Industry was of the opinion that the industry's attitude towards research indicated an insufficient appreciation of the question. Scientific workers in the Area are definitely of the opinion that much more could be accomplished by the industry in the development of research work through the establishment of co-operative research on a large scale.

It is difficult to frame any statistical estimate of the effect which these developments have exercised upon the employment capacity of

the industry. Nevertheless, there is little doubt that the immediate consequence of some of them has been to reduce the number of persons who need be employed for the production of a given quantity of coal. This is particularly true of the concentration of coal production and the introduction of new machine methods in the mining of coal. At the 1929 level of productivity, the 1913 output of coal could be obtained by just less than 200,000 workpeople and in consequence, something between 25,000 and 28,000 fewer workpeople would be required than in 1913. Compared with 1924 the difference is even more striking. When allowance is made for the increase in the number of hours worked per shift from $7\frac{1}{2}$ in 1924 to 8 in 1929, the 1924 output could be obtained by 59,000 fewer workers than were employed in 1924.

When all the factors affecting the supply and demand for coal are reviewed it does not seem probable that the average annual production of coal in the Area in the next five years will differ greatly from the annual average of the last five-year period. An average annual production in the region of 50 million tons (the output of 1924) may be expected. On this basis an estimate of the future labour requirements of the industry can be made.

At the 1930 level of productivity, namely, 275 tons of coal raised per person employed, an output of 50 million tons could be obtained by 182,000 persons on the average, while at the 1929 level of productivity, namely, 284 tons per person, only 176,000 persons would be required. To the numbers arrived at on each of these assumptions there has to be added an allowance for the reduction in the length of the working day from 8 hours in 1929 and 1930, to $7\frac{1}{2}$ hours in 1931. When this has been made, the numbers are increased to 194,000 and 188,000 respectively. These figures, therefore, indicate approximately the number for whom continuous employment is to be expected on this purely arithmetical calculation in the course of the next few years.

On the more favourable assumption that the output of the next five years will be as good as that of the five years before the War and of the year 1929, namely, 54 million tons per annum, the numbers required on a $7\frac{1}{2}$ hours' day at the 1930 level of productivity would have to be increased to 209,000 and on the 1929 level of productivity to 203,000. The mean of 194,000 and 209,000 is about 200,000 and it is almost certain that this is the maximum number of persons who are likely to be employed in the coal industry of the North East in any year in the near future.

It is shown in the special Memorandum that the number of persons insured in the industry in the Area has been reduced to just over 200,000 in 1931. It would appear, therefore, that the point is now being approached at which no considerable reduction in the numbers attached to the industry is to be expected. Indeed, assuming that the average annual output in the next five years will amount

to 50 million tons and that this output will be obtained by 188,000 persons, then the number of persons who would be unemployed on the average in these years would be only 12,000 or 6 per cent. of those attached to the industry at the present time. If the numbers attached to the industry show no further decline below the present level of 200,000 persons, this will represent a reduction of fully 40,000 on the numbers who were attached to the industry in 1924.

In conclusion, therefore, it would be unwise, having regard both to the prospects of the industry and to the numbers at present attached to the industry, to say that there is any considerable surplus of labour in the coal industry at the present time. On the other hand, however, if the workpeople who secured employment in the industry in 1924, but who have ceased to be insured in the industry since that year, have not been absorbed into other industries within the Area or transferred to industries outside and are therefore still unemployed within the Survey Area, then the surplus of workpeople available to the coal industry must be fully 40,000 persons.

(iv) **The Iron and Steel Industry.**

The iron and steel industry of the North East Coast ranks considerably below several other industries in importance in the industrial economy of the Area. At the 1921 Census it employed in its heavy branches, i.e. at blast-furnaces, steel-works and rolling-mills, 46,000 persons, or 5.2 per cent. of the numbers who were recorded in the industries of the Area in that year, and on the average of the five years 1923-30 (excluding 1925, 1926, and 1928) 39,000 persons, or 5.6 per cent. of the average number of persons insured under the Unemployment Insurance scheme, in all the industries of the Area, were attached to the industry. If this number is increased to 49,000 by the addition of the 10,000 persons, who are insured on the average of these years in iron ore mining and at coke ovens and by-products works, the proportion of the total insured population which this number represents is still only 7 per cent. The statistics secured from the 1924 Census of Production show similar results. In this case as in the case of the coal mining industry, the North East Coast is more dependent than the country as a whole upon the iron and steel industry. At the 1921 Census only 1.3 per cent. of the occupied population of Great Britain was engaged in the heavy branches of the iron and steel industry, whereas in this Area the corresponding proportion was 5.2 per cent. The Unemployment Insurance figures reveal the same situation. In the North East the proportion of the insured population in these divisions in 1930 was 4.9 per cent. while in Great Britain it was only 1.7 per cent.

In 1913 the production of pig iron on the North East Coast amounted to 3.9 million tons, or 37.7 per cent. of the total output of the country. On the average of the five years 1925-30 (excluding 1926), however, the pig iron production of the Area has

been only 2.1 million tons annually or 30.3 per cent. of the country's output. Thus in the production of pig-iron the North East Coast has declined absolutely and relatively to the country as a whole. The position occupied by the Area in the production of steel ingots and castings reveals the same general tendency. In 1913 the North East Coast district produced 2.0 million tons of steel ingots and castings, or 26 per cent. of the country's production in that year. On the average of the five years 1925-30 (1926 excluded) it produced 1.9 million tons annually or 22.6 per cent. of the average annual output of Great Britain in the same period.

In order to review the present and prospective employment position of the industry it seems desirable to consider together the volume of employment and unemployment in iron ore mining, at coke ovens and by-products works, as well as in the two heavy branches of iron and steel manufacture.

Between 1923 and 1930 there has been a continuous decline in the total number of persons at work in the four divisions of the industry which have just been specified. The over-all decline amounts to 11,000 persons. Between 1924 and 1930 the decline amounts to 8,000 persons. In 1930 the industry provided employment for 79 per cent. only of those who were employed in it in 1924. The collapse of 1931 is measured by the fact that only 58 per cent. of the numbers who were at work in the industry in 1924 were recorded as in employment in June of this year. Although there has been a decline of 12,000 in the number of persons insured in the industry between 1924 and 1931, the percentage of unemployment has been higher in most years in the iron and steel industry than in all industries of the Area taken together. In the best year of the period, namely 1929, the proportion of unemployment amounted to 14 per cent. and in the worst year, 1931, to 42 per cent.

Between 1923 and 1930 the output of iron and steel in the North East Area has, on the whole, been well maintained. In the case of steel production the average annual output of 1.8 million tons is very little less than the output of 1913. In 1927 and 1929 the output of steel ingots and castings exceeded the output of 1913, and was almost certainly as large as the output of the Area in 1917, the year of maximum recorded production. With regard to pig-iron production in recent years the position is not essentially different. Indeed the output of the blast-furnaces of the Area has been remarkably stable. Compared with the volume of output before the War, however, there has been a marked decline.

The decline in the number of persons employed at blast-furnaces, steel-works and rolling-mills has not been accompanied by a corresponding decline in the production of pig iron and steel. Throughout the period, as the detailed report shows, there has been a marked increase in the output per person employed in each of these two principal divisions of the industry. In 1929, an output of

2.35 million tons of pig iron, or 100,000 tons greater than that of 1924, was obtained with fully 3,000 fewer workpeople, and an output of 2.21 million tons of steel, or almost 500,000 tons greater than that of 1924, was obtained by practically the same number of workers, namely 22,500.

On the average of recent years, 1924-30 (excluding 1926) the imports of iron and steel products into the North East Area have amounted to about a quarter of a million tons per annum, while exports for the same period have amounted to 560,000 tons annually. Although there has been some slight increase in the imports of iron and steel during the period, the position of the industry in the Area has been much more affected by the decline in exports which has taken place during these years.

It is unnecessary to investigate here the broad economic and political factors which have affected the position of the industry throughout the period since the end of the War. In the main they are the same as those which have operated in the case of the coal mining industry. In the iron and steel industry, however, an additional complicating factor has been the tariff policy of certain overseas countries. Italy, Japan, China, several South American Republics, India, and Australia have increased their tariffs on certain iron and steel products appreciably above the level which prevailed before the War. All of these countries form markets for iron and steel in which the North East might legitimately have expected to share, and there can be little doubt that the tariff policy which they have adopted accounts, in part at least, for the decline in the export trade of the industry in the North East.

Although the period 1924-30 has been one of stability at a comparatively high level of production, nevertheless, the feeling prevails that the iron and steel industry has not been in a prosperous condition. For this apparent paradox there are a number of possible explanations. In the first place, the productive capacity of the industry is probably considerably greater than the output which has been achieved in any of the past seven years. This is a legacy of pre-war blast-furnace capacity and of wartime extensions to steel-making capacity. In the second place, prices of iron and steel products have risen considerably less since 1913 than prices of commodities in general, and since this relative cheapening of iron and steel prices has not been accompanied by a corresponding reduction of costs in the industry, the business of iron and steel production has tended to be unprofitable. In the third place, the financial structure of the industry in the post-war period has meant that the payment of debenture interest has necessitated heavy withdrawals from reserves so that little has been available on ordinary capital.

There can be no doubt that the iron and steel industry of the North East Area has maintained its efficiency relatively to that

of other iron and steel producing centres within the country. The equipment of the blast-furnaces, and steel works of the North East appears to be considerably better than that of the country as a whole. Considerable extensions and improvements have been made to the equipment of the industry in the course of recent years.

Apart from improvements in plant and the technique of production, improvements have taken place in the organization of the industry in the Area. The most striking of these has been the movement towards the grouping of its most important iron and steel producing companies. There are still opportunities for further movement in this direction. On the other hand, it is difficult to know whether the grouping which has already taken place has come about as a result of the recognition of the economic advantages of the concentration of control, or whether the industry in the Area has been tempted into the movement by the prospects of a tariff to be granted on condition of regional amalgamation.

The importance of research is adequately realised by those most closely connected with the industry, and in recent years there has been a considerable extension of work in this direction.

On the whole, it seems a reasonable assumption that the activity of the industry in the Area will be about the same in the course of the next few years as it has been between 1924 and the present time. On this assumption it is possible to make an estimate of the future labour requirements of the industry. In 1929, the year of maximum production and minimum unemployment since 1923, approximately 29,500 persons were employed at the blast-furnaces and steel-works and rolling-mills of the Area. If to this number is added the 4,400 persons employed at iron mines, and the 3,600 persons engaged at coke ovens in the Area, then 37,500 persons would seem to be approximately the maximum number for which the industry is likely to provide employment in the next few years. In July, 1931, there were 40,300 persons insured in these four divisions of the industry. It would appear, therefore, that there is still room for a reduction in the number of persons attached to it. At present there is an estimated surplus of about 2,800 persons above the numbers likely to be employed in the best year in the near future. This number would represent a rate of unemployment of 7 per cent. on the 40,300 persons insured in the industry in a very good year from the point of view of production. Accordingly, some reduction in the number of persons attached to the industry would seem justifiable. A total of 38,000 persons in the four principal divisions would not be likely to impose any undue restriction on the labour supply of the industry. On this basis, therefore, the surplus number of workers is about 2,000. In the case of the iron and steel industry as in the case of the coal mining industry, if the numbers who were attached to the industry in 1923, the year of maximum employment, are still available, then the surplus is increased by 15,000 to 17,000 persons.

(v) **Engineering.**

Although figures will be given and some analysis made of numerous minor metal-working trades, our main attention is directed to an examination of five trades which in the Area in 1923 covered between them no less than 88 per cent. of the total insured in all the engineering and minor metal-working trades taken together. In 1930 the corresponding figure was 86.5 per cent.

These five main trades are General Engineering, Electrical Engineering, Marine Engineering, Constructional Engineering, and Stove, Grate, Pipe, and General Iron Founding.

Detailed examination of the insurance statistics has revealed that whether the figures considered be those of the insured, the employed, the unemployed, or those of the percentages of unemployment, their movement in the Survey Area is broadly a mirror of their movement in the country as a whole. For both there have been decreases in the insured and the employed in General and Marine Engineering and for both there have been increases in Electrical Engineering, Constructional Engineering, and Stove, Grate, Pipe, and General Iron Founding. There is however over the whole period a persistent tendency for the percentages of unemployment in the different engineering trades to be higher in the Survey Area than in the country as a whole. While there appears to have been a gradual decrease in the gap between the two it is still true that in 1929—the most active year of the late post-war period for Area and country alike—the gap is large. In Marine Engineering, for example, it is 3.7 per cent., in General Engineering 8.7 per cent. and there is a gap even in Electrical Engineering of 5.9 per cent. In the depression of 1930-31 it shows a tendency to widen again and it seems to us that these are clear signs of labour redundancy.

A further disquieting fact revealed by the insurance statistics is, apart from the five trades mentioned, the small proportions or the small numbers absolutely of the country's insured engineering workers and workers in minor metal-working trades in the Survey Area. General Engineering and Marine Engineering alone run into five figures and it is precisely these trades which have declined.

To gauge the trend of production in engineering is a task hemmed in by innumerable difficulties. An attempt has been made to assemble all the available data but either because of the non-existence of important items, or the statistical dubiousness for purposes of comparison of much of what does exist, no complete picture is possible. The data of the Census of Production relate to one year only, the exports of machinery are not sufficiently classified to show the trend of different sections of machinery making: while locomotive exports—almost a complete guide to production in the commercial locomotive making group since most of their work is for export—fail to give a complete picture of production in the Area

by failing to record the activity of the shops of the L.N.E.R. The only data of which an index number can be made are the indicated horse-power figures showing the production of the different marine engine builders of the United Kingdom which are published annually by the Glasgow Herald. These enable us to see not only the trend of production in marine engineering over the period but also to discover the proportionate yearly output on the rivers of the North East Coast. Examination shows that while production in the Survey Area has not maintained the level of activity of 1913 or the high level of 1919 definite recovery has been made in the late post-war period from a mid post-war period decline. This is true also of England and the United Kingdom. They too show recovery from a weak mid-period but in their case the recovery is greater than on the North East Coast. The result is that the proportion of English and United Kingdom work done on the North East Coast tends slightly, but only slightly, to fall.

Within the Survey Area the most important features calling for notice are the stronger position of the Tyne, relative to the Wear and Tees, a tendency for a slightly greater proportion of the Area's work to be done on the Tyne, and a tendency also for a slightly greater proportion of the diminished total of work to be done by firms which are shipbuilders as well as marine engineers as compared with firms which are marine engineers only.

Foreign trade statistics have again given difficulty but except in locomotives, foreign trade does not appear to be of dominant importance. Most firms of course engage in export trade but replies received from business men as to the proportion of work they do for home and foreign account reveal a smallness of the foreign proportion which is surprising. Briefly it would appear that the North East Coast is, on an average over the post-war period, responsible for 1.84 per cent. of the United Kingdom's export of machinery, 22.1 per cent. of its export of locomotives and 6.95 per cent. of its export of carriages and wagons. The tendency masked by these averages is for the proportion of the Area to diminish in locomotives, and carriages and wagons, and for the proportion of exports of machinery to remain below the level of the immediate post-war period but to establish, apparently, a late post-war average above that of the middle part of the post-war period.

Further there is that tendency which has also been noticed in shipbuilding for the division of the export trade to move, on balance, slightly towards the Tyne ports and away from the Wear and Tees.

Financial data are more scanty, more intangible, and more tantalising than even in the case of foreign trade. For a few companies only can data be collected, since only few are of the Joint Stock Company type. While generalization upon such scanty material as can be collected would be merely foolhardy it is yet true to say that the glimpses they give confirm the view that it is in Electrical and Constructional Engineering and Stove, Grate, Pipe, and

General Iron Founding that the greatest level of activity in the post-war period has been realised in this Area. It is by firms in these sections of the industry that the greatest profits have been made.

So far as concerns the particular circumstances of the five trades on which our main attention has been directed their records show considerable dissimilarity. General and Marine Engineering have declined; the other three have advanced. The explanation in the case of General Engineering would appear to be mainly the generally depressed condition of the Area, the loss in armaments work, particularly in the second half of the post-war period, and a decline in foreign orders for locomotive work. In Marine Engineering a sufficient reason seems to be found in a combination of a decline in shipbuilding and an intenser competition due to the entry of firms not previously makers of marine engines.

The explanation of the activity of the three more favoured trades appears, taking them in order, to lie in the gradual development of the use of electricity over the period, the development of electric power systems both here and abroad, and an enterprise and an initiative which have made the electrical engineering firms of this Area known throughout the world. In Constructional Engineering much seems to have depended upon re-equipment and large scale planning by large corporations or municipal authorities here and abroad. This had already received a check before the depression began but with the depression, the cessation of large scale spending, and further troubles either economic or political in their overseas markets the check has become pronounced. Much the same is true of Stove, Grate, Pipe, and General Iron Founding. A large proportion of its work has been upon orders stimulated by the post-war building boom, and upon orders for railway companies. For the reasons given in connection with Constructional Engineering, these have received a check and Stove, Grate, Pipe, and General Iron Founding, too, has declined.

The outlook for these trades, certainly over the next few years, is not one which can be simply expressed. In no instance, however—not even, surprising though it may seem, in Electrical Engineering—can it be said with confidence that the immediate prospects are good. In each the conclusion is that the trade has either a capacity and a labour supply in excess of requirements, or else as in Electrical Engineering that the next few years may bring a decline in its orders.

In General Engineering it is freely admitted that in the subgroup, locomotive engineering, there is excess capacity and that in armaments a decline in orders has occurred which must perhaps be regarded as permanent. The armament firms have, in any case, spent considerable time and money on the development of electric propulsion for ships, and on the development of the Diesel-engined locomotive, road, and rail coaches which appear to be commanding the serious attention of the railway companies. It

is clear then that enterprise has not been lacking. Its appearance is to be welcomed; but it would be foolish to accept this and fail at the same time to see that because of it competition in the locomotive and vehicle world will be both more intense and more complex. Enterprise has also been shown in the developing of coal-cleaning plant, in spring making and other minor specialities, and it is clear that no charge of lack of technical enterprise can be levelled against the Area. It does not seem likely however that developments on these lines will cancel out the losses caused by the decline in locomotive exports and armament work. The virility, technically, is there but the mass is too great and the period we have to consider too short for the heaven to do its work. Further, some work which might otherwise have been done in the Area will probably be done outside. In the next few years there should be a great increase in the Area's demand for coal-cutting machinery. Supplies to meet this demand will however tend to come from outside; outside makers have already strongly established their connections within.

In Electrical Engineering the future is uncertain. It is clear that "grid" work cannot go on indefinitely and it is clear that this has provided them with much of their employment. If no large scale scheme such as railway electrification should be introduced, then it is probable that they will experience a slight decline. They are, however, aware of this. They are already developing new lines to take up the likely future "slack" and the prosperity of the last few years has provided them with adequate profits out of which to finance them. The prospect therefore though one of decline cannot be considered to be as serious for the Area as in other sections of its engineering trades. The firms who lead the industry are in the first rank; their names are world known; the future is, it would seem, to be one of electricity—there is no reason to suppose therefore that they will not be in the forefront of any developments taking place.

In Marine Engineering there is, it would seem, every likelihood of a continuance of the present situation into the next few years. Competition is acute, the position has been made more complex by the fact that firms must, as a rule, hold themselves ready to take orders for either steam or Diesel-engined vessels, and failing co-operation, all that can be expected is a period of intense economic and technical competition in which the weaker will fail.

A similar period of intense competition would appear to be in front of Constructional Engineering, and Stove, Grate, Pipe, and General Iron Founding. Additional firms, though not necessarily new in every respect, have taken up Constructional Engineering work but demand seems to be entering on a period of contraction. Failing co-operation, intense competition is the only result to expect.

Enquiry however both amongst business men and amongst outside impartial and expert observers, leads conclusively to the view that the relative technical efficiency of this Area is being maintained.

No charge, it will be seen then, can be laid against these sections of the engineering industry on the score of technical backwardness. If any charge is to be raised, it is rather that firms are tending to play that individualist game of cut-throat competition which was condemned in the Report of the Committee on Trusts as long ago as 1919. Undercutting—particularly in locomotive and marine engineering—is rife, but while it does not fail to rouse the keenest resentment, it has not yet, it would seem, led to any definite steps being taken to reduce capacity by speedier, less exhaustive, and more deliberate co-operation.

We come now to the problem of labour redundancy. Difficult at all times, difficult in all trades, this is a question which, in engineering at the present time, is perhaps more difficult than in any other. Discussion of these difficulties, however, would expand this note needlessly. It is best then merely to refer to the method of assessment which we have chosen, to show the numbers which it stamps as redundant, and leave it to be accepted or rejected. On the basis outlined in the memorandum, 65,400 persons were insured and 56,835 persons were employed, leaving 8,565 persons unemployed. And this it should be remembered is the number unemployed in what has to be termed a good post-war year. The greater part of them therefore will be redundant. Some, however, must remain to provide industry with that fringe of labour which apparently it requires as a normal feature of its working. The question is—how many? Before the War the average Trade Union unemployment percentage for Shipbuilding, Engineering and Metals combined over the years 1911-14 inclusive was 3.10. These years gave a run of relatively low percentages. If then we grant the Area's engineering trades this fringe of labour in their best year this 3 per cent. is equivalent to roughly 2,000 persons. This means that there must be roughly 6,000 workers in these five trades who will not be needed even in a good year. This is a figure of labour redundancy which we put forward for these five trades taken as a whole.

(vi) **The Shipbuilding and Ship-repairing Industry.**

In no other branch of industry, with the possible exception of the Textile Industries, was the superiority of Great Britain prior to the War quite so marked as in shipbuilding, ship-repairing, and marine engineering. In the middle of the nineteenth century this country was building little, if any, more tonnage than the United States of America. But when iron, and later, steel, instead of wood, began to be used in the construction of vessels, Great Britain came to take a predominant position in the industry. At the beginning of the present century the shipbuilding yards of this country were supplying over 65 per cent. of the world's output of merchant ships, and the percentage just prior to the War was still over 60 per cent. If we include warships the proportion was probably nearer 80 per cent.

In this industry the North East Coast ports take a leading place. Together they constitute the chief shipbuilding centre of Great Britain and Ireland, exceeding even the Clyde in the annual tonnage of merchant shipping launched from their yards. Within the Survey Area itself the industry yields pride of place only to the coal mining industry which, according to the Census of 1921, employed some 25 per cent. of the total workers in all industries in the Area, as compared with some 12 per cent. for the shipbuilding, ship-repairing, and marine engineering industry.

According to the Census of Production of 1924, there were 37,190 persons employed in the industry in the Survey Area, of whom 34,740 were operatives, and 2,450 administrative staff. The total gross output of the firms in the Area amounted to £15,939,000, the net output being £5,996,000, and the net output per head £161.

The five years prior to the War were years of prosperity following a serious slump in 1908 and 1909. The tonnage of warship construction was considerable, and of the tonnage of merchant shipping being built throughout the world for other than British owners this country was constructing some 26 per cent.

The position since the War has changed in several important respects. To meet national needs during the War, and the increased demand for ships in the immediate post-war years, the building capacity both of the North East Coast and of the country as a whole, was considerably increased. On the other hand the demand for new ships after 1921 decreased, whilst the demand for warships since the War has been less than one-third of its former amount. Moreover, British shipbuilders during the War had to concentrate on ships for our own needs, and thus many valuable connections with foreign shipowners were lost; whilst at the same time a stimulus was given to the expansion of shipbuilding in other countries. The task of adjusting itself to post-war conditions has therefore been a difficult one for the shipbuilding industry of this country; and the cost of adjustment, both to capital and labour, has been heavy.

The highest tonnage of merchant shipping launched at the North East Coast ports, taken together, was 1,005,148 tons in 1906, the next highest being 977,278 tons in 1911, and 974,109 tons in 1913. But these are peak figures. In the five years 1900-1904, the annual average was 724,190 tons, in 1909-1913, 770,638 tons, and in the four years 1927-1930—excluding 1926 on account of the General Strike—it was 624,028 tons. In the last four years, therefore, the North East Coast ports show a decline in their average annual output of 13.9 per cent. and 19.1 per cent. compared with the two former periods respectively. The annual average world output in the period 1909-1913, had increased some 20 per cent. compared with that in the period 1897-1901, and had declined less than 1 per cent. in the period 1926-1930; whilst the total annual

average British output for 1927-1930 shows an increase of 5.8 per cent. compared with 1897-1901, but a decrease of 6.8 per cent. compared with 1909-1913. British output has therefore failed to keep pace with world output, her proportion of the output of merchant tonnage having fallen from 65.3 per cent. in 1897-1901 to 61.1 per cent. in 1909-1913, and to 53.2 per cent. in 1927-1930. The proportion in both 1920 and 1921 had fallen to 35 per cent., and it was only 41.8 per cent. in 1922. In 1923-1924 it averaged 53.6 per cent., and in 1929 54.5 per cent. The fact is worth noting that British shipbuilders since 1923 have succeeded in recovering to some extent their pre-war position in the shipbuilding industry of the world. That they have not recovered it to a still greater extent is probably due to the fact that the proportion of world shipping owned by British ship-owners has fallen from about 39 per cent. in 1914 to about 29 per cent. in 1930.

The average annual output from the North East Coast ports in the period 1927-30 has declined relatively to that both of the world and of this country. As the figures given in the Memorandum show, it has declined relatively to the Clyde, though its annual output still exceeds that of the latter centre. The decline has not, however, been uniform at the four centres of the North East Coast. The output at the Hartlepoons is less than half that of the period 1910-1913; that of the Tees is about 40 per cent. less. The output of the Wear is about 25 per cent. less, and that of the Tyne about 10 per cent. less. We may express this in another way and say that of the diminished total output of the Area, the share of the Hartlepoons and of the Tees has decreased, that of the Tyne has increased, whilst the Wear has maintained her proportion. The Tyne is therefore to a greater extent than before the War the chief shipbuilding centre of the North East Coast.

It is difficult to account for this decline in the shipbuilding industry of the Survey Area. The North East Coast is unsurpassed in the building of ordinary cargo boats. The Tyne, the Wear, and the Tees, but especially the Tyne, have established a special reputation for the construction of oil tankers. During the last seven years these ports have built nearly two-thirds of the tanker tonnage launched in this country and very nearly one-third of that of the world. In the building of tankers, therefore, the North East Coast far outstrips the Clyde. Yet in spite of this output of tanker tonnage in recent years, the output of all kinds of merchant shipping from the North East ports is now only some 120,000 tons a year greater than the output from the Clyde, whereas prior to the War their output was some 330,000 tons a year greater. The Area appears therefore to have lost ground in the building of general cargo boats, since the Tyne, though she built the "Mauretania," and more recently the "Monarch of Bermuda," has never been able to rival Belfast or the Clyde in the number of liners built.

It has been suggested to us that part of the decline is due to the fact that some of the shipbuilding yards in the Area have failed to keep pace with the times, and that neither their organization nor their equipment has been kept up-to-date. This may be true of some of the yards on the Wear and Tees and at the Hartlepoons, where many of the firms are private firms, and, compared with public Joint Stock Companies, have experienced greater difficulty in finding the necessary capital for reorganization and new equipment. But it is not true of the Tyne, where the yards are as well equipped and as efficiently organised as any in the country.

Another suggestion is that a reason for the decline may be the loss of a local connection with shipowners, owing to the tendency of shipowning firms to migrate to London. Such a movement from the Hartlepoons has been marked in recent years. We are, however, doubtful whether this would have much effect in diverting orders from the North East Coast. In any case we feel the effect would be but slight.

We are inclined to think that the relative decline of shipbuilding on the North East Coast is chiefly due to the depression in the shipping industry of the Area, since local shipowners are among its best customers; and that the decline is therefore traceable to the diminution in our exports of coal and of iron and steel. Moreover, the loss of our coal export trade with Scandinavian countries has also had its effect, since prior to the War these countries were among our best customers both in shipbuilding and ship-repairing.

The Tyne is practically the only port in the Area of any importance in the construction of warships. The annual average of warship tonnage built on the Tyne during the seven years 1907-1913 was 32,503 tons displacement, whereas the average annual output in the seven years, 1924-1930, was 8,304 tons gross, equivalent to less than 4,000 tons displacement. Thus in recent years the Tyne has built only about one-eighth of its pre-war amount. In the country as a whole, the diminution appears to have been to one-third the pre-war amount. The diminution on the Tyne is therefore much greater than that of the other shipbuilding centres taken together; and this diminution must be taken into account in estimating the future prospects of the industry in the Survey Area, particularly when it is remembered that, ton for ton, a warship employs far more labour than a cargo boat.

The repair of ships is, of course, an important and valuable section of the whole industry; and particularly so on the North East Coast where no less than 25 firms—of whom 13 are on the Tyne—are engaged in ship-repairing. For this class of work the Area offers exceptional facilities, and the fact that the ports of the Area are good bunkering ports helps to bring repair work to the North East Coast. It has been found impossible to obtain any kind of statistics which would enable us to make valid comparisons

of the amount of repair work done in different years. But a comparison of the numbers employed in June each year seems to indicate that a poor year for shipbuilding is not always a poor year for ship-repairing. It is true that 1929 and 1930, as in shipbuilding, appear to have been relatively good years, and 1926 and 1931 poor years, but, in general, we get the impression that there is less variation in the volume of work from year to year in ship-repairing than in shipbuilding; though as one might expect, the variation from month to month may be greater.

Measured by the amount of tonnage *launched* the years 1929 and 1930 were relatively good years in the shipbuilding industry. But if we consider the tonnage under construction, or better still, the tonnage commenced, we find that a marked change for the worse began about March, 1930. A rapid fall occurred in the number of orders received. 1929 and 1930 were, in fact, busy only because in them ships were being completed. At the beginning of 1931 the industry was in a far worse position than it had been in for many years. By the September quarter, the tonnage under construction on the North East Coast was less than one-fifth the amount in the March quarter 1930, and the tonnage commenced less than one-eighth. The percentage unemployment in the industry in the Area, as measured by the June figures each year, rose from an average level of about 30 in the period 1924-1929 to over 70 per cent. in June, 1931. This marked change in the condition of the industry is not confined to the shipbuilding industry of the North East Coast. It is shared by the rest of the country, and indeed by the other shipbuilding centres of the world. But the change is, if anything, more marked in the Survey Area. The percentage unemployment in the industry in Great Britain and N. Ireland was 56, as compared with 70 per cent. in the Area; whilst the tonnage under construction had shrunk to one-fourth its former amount, as compared with one-fifth for the Survey Area. The figures for tonnage commenced during the September quarter show a slight increase over the tonnages for the March and June quarters, and the increase has been greater on the North East Coast than on the Clyde or in the rest of the country. But the increase is a trifling one, and it leaves the industry both in the Survey Area and in the country generally in a most desperate position.

Foreign competition with British shipbuilders, prior to the War, was almost negligible. It is only since the War, and especially during the last six or seven years, that it has become acute. But to-day it is probably true to say that the best continental yards are as well-equipped as our own. In some respects, perhaps, they may be over-equipped. Their method of working, too, differs from our own; and in the adoption of new methods they are, it appears, less hampered by custom and usage to which the workers of the industry in this country attach importance, and which they are unwilling to relinquish. Much of the work is done by unskilled labour, which in this country would be done by skilled labour.

Whilst it may be true that foreign shipbuilders in the past have on the whole attached more importance to research than British shipbuilders—perhaps necessarily so in view of their smaller experience—yet we feel that the industry now recognises that if British shipbuilding is to hold its own in the future increasing attention requires to be given to research work.

Certain changes are taking place in the industry. The use of mechanical appliances is growing. Particular instances are the pneumatic riveter, now becoming fairly general, and a plate-punching machine, which enables one man to do the work formerly done by seven men. A considerable improvement in the methods of cost accounting has also taken place, enabling builders to watch each item of cost far more closely than previously. But, except for certain reductions in the size of the administrative staffs, there appears to have been but little change in the structure and organization of the industry as a whole. Some amalgamation of firms took place on the North East Coast during the post-war boom, but since that time there has been little or no attempt at amalgamation. There has been little tendency to co-operate in a common selling policy; but competition between individual firms, especially at the present time, is very keen; and it is possible that a change is impending, and that in the near future shipbuilders may co-operate in some scheme to prevent undue competition between them.

Swedish and Danish builders attribute much of their success in recent years to the fact that they have specialised in the building of certain classes of ships. In the Memorandum we discuss the question whether a greater degree of specialization might not be advantageous to builders in this country. A certain amount of specialization has taken place in this country, and notably on the North East Coast, especially in the matter of tankers and certain classes of cargo boats. We are inclined to the view that this movement might with advantage be carried further; though the general opinion among local shipbuilders seems to be that this can only be economically done to a very limited extent, especially in the case of the larger firms.

A more pressing problem in the opinion of British shipbuilders is that of the reduction of the output capacity of British yards. It is estimated that our present capacity is at least double that of the probable future demand. Hence the problem in the shipbuilding industry is similar to that in the coal mining or the cotton industry, namely a capacity in excess of requirements. In the Memorandum we describe the method by which the shipbuilders of the country hope to reduce this redundant capacity, and the results they have already achieved. Up to September, 1931, twelve yards had been bought out and dismantled, eight of them on the North East Coast. Seventy-one building berths with a total annual capacity of about half a million tons had thus been eliminated. It is obvious that care will have to be exercised in this elimination of yards if a satisfactory balance between different types of yard,

and between the different shipbuilding centres of the country is to be obtained.

We have attempted, though with many misgivings, to estimate the probable future demand for British-built merchant ships. Our conclusion, based on an argument too long to reproduce here but which is given in the Memorandum, is that the average annual demand in the near future will be somewhere about 1,364,000 tons. Mr. Ayre, the late president of the Shipbuilding Employers' Federation, has recently estimated it at 1,500,000 tons. To this would have to be added whatever warship tonnage may be required. But the amount of this is too uncertain for us to estimate.

On the assumption that the North East Coast can maintain its proportion of British-built tonnage at 45 per cent. we should expect that the annual average demand for merchant tonnage at the North East Coast ports would amount to about 614,000 tons, with a range of from 400,000 tons in a slump year to about 800,000 in a good year.

If this estimate be at all near the truth, we may regard 1924 when 631,000 tons were launched, or 1928 with 641,000 tons as rather better than average years; 1925 when 382,000 tons were launched as a lean year, and 1929 with 679,000 tons as the nearest approach to a good year in the later post-war period.

It is difficult to correlate these tonnages with the number of workers employed in the years in question, since only the June figures are available. But on the evidence before us, which however we feel is very slender, we are inclined to the view that except for abnormally lean years, such as 1923 or 1931, the number of persons likely to be employed in the industry in the Survey Area will range from about 30,000 to about 40,000. If this estimate is approximately correct it follows that in lean years a percentage unemployment figure of about 25 per cent. will still have to be faced, quite apart from the amount of labour which may be regarded as definitely surplus to the industry in the Area.

The figures of insured workers attached to the industry in the Area seem to indicate an appreciable flow into and out of the industry, which, on general grounds, is to be expected. But taking the average for the years 1929 to 1931 we get a figure of about 53,000. There would appear therefore to be a surplus in the Area of about 13,000 workers, even in busy years. We cannot however regard this as anything better than a reasoned guess.

The statistics seem to indicate that proportionately more workers have remained attached to the shipbuilding industry in the North East Coast Area in relation to tonnage output than in the other shipbuilding centres of the country. It is impossible for us to say to what this is due, but it certainly suggests that some pooling of labour in the Area, or at least along the Tyne and the Tees is desirable. We would urge that the scheme submitted to the Ministry of Labour by the Local Employment Committees on Tyneside should be re-examined and an attempt made to induce both the Employers' and the Workers' organisations to give it a trial.

It must be borne in mind that this figure of 13,000 is merely a total of all grades of workers in the industry. It does not follow that there will be a surplus, much less a proportionate surplus, of all grades of labour. The proportion of skilled workers in the industry seems to have remained fairly constant over a long period, but changes in methods are probably causing a change in the proportions of semi-skilled and unskilled workers, the extent of which cannot be inferred from the evidence before us.

(vii) Heavy Chemicals.

In the North East Area in July, 1929, 16,460 persons were insured under the Unemployment Insurance Acts in the heavy branches of the Chemical Industry. This number represented in that year 2.4 per cent. of the total insured population of the Area and 15.7 per cent. of the total number of workpeople insured in the same branches of the Chemical Industry in Great Britain. Although the industry is thus one of the smaller industries of the Area it manufactures a considerable proportion of the total volume of chemicals produced within the country and has developed a considerable export trade in chemical products. The value of chemicals and manures exported from North East Coast ports rose from £1,800,000 in 1913 to £5,388,000 in 1929 and £4,201,000 in 1930. The decrease in 1930 is mainly due to a fall in the value per ton of ammonium sulphate, of which 451,000 tons at a value of £4,304,000 were exported in 1929 and 403,000 tons at a value of £3,105,000 in 1930. Despite changes in the value of money over this period these figures indicate the growing importance of the industry in the Area.

Striking changes have taken place in the course of the years 1923-1931 in the number of persons who worked in the heavy branches of the chemical industry in the Area. Between 1923 and 1929 the number of persons employed increased from about 5,000 to 15,700, but since 1929 the number has declined to 14,000 in 1930 and to about 6,000 in 1931. The increase in employment up to 1929 records the developments which have taken place at Billingham where a very considerable expansion of activity has been undertaken by Imperial Chemical Industries Limited. The decline of 1931 is almost entirely the result of industrial depression at home and abroad. In every year for which data have been supplied by the Ministry of Labour between 1923-1931, except 1929, the number of persons insured in the industry has been appreciably greater than the number for whom it was able to provide employment, and in consequence the percentage of unemployment has been high.

In view of the rapidity with which the industry has expanded on Tees-side in recent years and the fact that there is no available estimate of the probable limit of its expansion, it is impossible to form any trustworthy estimate of the probable future labour requirements of the industry. In order to enable us to make an estimate of the total labour requirements of the Area however we

have assumed that there is no labour surplus in the chemical industry and that the extent of its need for labour in the near future is likely to be about the same, namely 16,500 persons, as that which prevailed in 1929, the best recorded year.

(viii) **The Printing and Allied Trades.**

The Printing and Allied Trades have been chosen for detailed investigation for three reasons, firstly, because they form a good example of one of the smaller industries, as distinct from one of the very minor industries in the Area's industrial activities; secondly, because they constitute an industry distributed fairly widely over the Survey Area as a whole; and thirdly, because their prosperity depends to so great an extent on the prosperity of the other industries in the Area, since in the main their output is for consumption within the Area itself. Changes in their prosperity should, therefore, reflect in a special way the changes in the prosperity of the Survey Area as a whole.

Although these trades employ only 9 per 1,000 of the total number of persons engaged in the industrial life of the Area they include some 300 firms or establishments, varying in size and equipment from the one-man village printer's business to the firm employing between 300 and 400 workers and using the most up-to-date methods and machinery. The products, moreover, vary from a simple label to a daily newspaper and illustrated magazine. During the last ten or twelve years the technique of these trades, especially of Printing, has made great progress. Motor-driven machinery has been introduced even by firms which could not hope to keep it fully employed; and quite small shops have installed monotype composing machines. In Bookbinding and Paper Box Making too, new and efficient machinery is now in general use. The most important new processes are off-set Lithography—a process of transferring the print to a rubber sheet and thence to paper—and a new development of half-tone illustration. The demand for printed office equipment is growing. Retail trades, however, are reducing their demand for printed catalogues and leaflets and are advertising more extensively in newspapers.

Competition among printers is very keen throughout the Area. There is no foreign competition, and very little with British firms outside the Area. The papermakers have to meet strong foreign competition, with Norway, Sweden, and Finland. With a view to helping its members, the Master Printers' Federation established a staff of cost accountants whose services have been in great demand since 1919; but price-cutting is so keen that in many instances the suggestions proved impossible to carry out.

The trades fall into three groups; (1) Printing, Publishing, and Bookbinding, (2) Paper and Paperboard Making, (3) Cardboard Box, Paper Bag, Wallpaper, and Stationery Manufacture. In 1930 the number insured in all three groups was 9,530, an increase of 1,460 over the number insured in 1923. This rise appears to be mainly

due to the establishment of a new evening paper in 1929 and to a development of Wall Paper Manufacturing in the same year which was not maintained.

Group 1 is much the largest. The total number employed was 4,901 in 1923 and 6,939 in 1930. During this period there was an increase in the proportion of adults and of males employed.

Group 2 employed 1,603 persons in 1923 and 1,518 in 1930. During this period there was some substitution of girls for boys, and an increase both in the proportion of adults employed and in the proportion of men to women.

Group 3 is the smallest. It employed 370 persons in 1923 and 347 in 1930. The number of men and women was the same in 1923, but in 1930 the women were nearly twice as numerous as the men, and there was a marked increase in the proportion of girls to boys. This change does not occur in group 1 and group 2. They are mainly men's trades, in which competition cannot be met by substituting female labour for male.

For all the groups taken together, during the seven years, unemployment percentages have risen. They were lowest in 1929, the best trade year of the seven, and highest in 1930, except for women, whose percentage was 16.5 in 1923, 23.5 in 1924 and 15.7 in 1930. Leaving out 1929, we find less variation for men and girls than for women and boys. This is in accordance with the fact we have already noted; that there was some displacement of boys by girls and of women by men. Unemployment in these trades is much worse in the North East Coast Area than in Great Britain and N. Ireland. In Papermaking it was worse than in Printing, Publishing, and Bookbinding and the divergence between this Area and the whole country is much greater. This is probably due to the pressure of foreign competition together with a fall in local demand.

Even in a period of depression there is always some demand for paper and printing, and thus unemployment has been less in these trades than in the heavy industries. But only a revival of general activity can increase substantially the amount of these products required by industry, commerce, and the public. Until this occurs, there is no hope of reducing the number of unemployed. In fact, in so far as competition hastens the introduction of labour-saving and cost-reducing appliances, unemployment will become more acute. At present, many paper mills are working short-time; and there is a new scheme for the rationalisation of the esparto paper trade, which if carried out will further reduce employment. No trade revival can be expected to absorb the large number now unemployed. In 1929, a comparatively good year, there were 435 insured persons out of work; in 1930 there were 1,026. Even if 500 of those unemployed in 1930 could be absorbed, together with those who will be displaced in the near future, there would still be nearly 550 unemployed persons. Allowing for a floating reserve we estimate the total redundancy at about 450 persons. This number would probably include a considerable proportion of skilled workers.

(ix) The Building and Allied Trades.

It is a commonly accepted fact of post-war experience, that the Building and Allied Trades have been prominent in that favoured group of trades which have expanded. At first sight the statistics of persons insured in these trades in the Survey Area would seem to show that its Building and Allied Trades are no exception. They covered as a group—and this includes Building, Public Works Contracting, Brick and Tile Making, Artificial Stone and Concrete, Clay, Sand, Gravel, Cement, Whiting, and Stone Quarrying—38,680 workpeople in 1924 and 41,940 in 1929, an increase of approximately 8 per cent. To these totals Building made the biggest contribution with an increase of roughly 3,000. Public Works Contracting diminished by roughly 200 persons and the other two recorded just sufficient increases to keep their relative importance in the group roughly steady. Building and Public Works Contracting are thus the two most important sections in the group and the former (68.5 per cent. of the total in 1924 and 70.4 per cent. in 1930) clearly takes the lead. Brick and Tile Making with roughly 4,000 workpeople (10.4 per cent.) at the two dates and Artificial Stone with roughly 1,000 (2.5 per cent.) also at the two dates are of secondary importance, though the former, as is suggested in the memorandum on the natural resources of the Area, might well increase.

The relative strength of this group of trades is also suggested by the fact that it accounted for 5.7 per cent. of the insured population of the Area in 1924 and 5.9 per cent. in 1929 and that at both dates the Area contained 3.9 per cent. of the country's workpeople insured in these trades. It thus increased relatively to other industries in the Area and kept its position relative to the industry in the country generally.

On this showing the position of these trades undoubtedly seems good but examination of the trend of employment in them compels us to revise this judgment. In Building, the number of the insured has, over the period 1923-30, continued to increase while the number employed has declined. In Public Works Contracting variations upwards or downwards of the insurance index have been accompanied by much greater proportionate variations in the employment index. An index of insured persons of 110, 97, and 120 for the years 1927, 1929, and 1930 respectively may be compared with an index of employed persons of 104, 75, and 93. In the other two trades a relative stability of the index of the insured has been accompanied by a downward movement of the index of the employed which in 1930 and 1931 becomes pronounced. This may be summed up in the one statement that whereas there has been an increase of 8 per cent. in the persons insured there has been over the same period a decline of roughly 2 per cent. in the persons employed. This situation, except in Public Works Contracting, has been projected into

1931. Additional circumstances have worked in the same direction to aggravate it further and the result has been that over the last three years the percentages of unemployment have ruled considerably higher than in the early years of which we have record. In Building, an unemployment percentage of 10.9 in 1924 has given place by 1930 to one of 22.6. In Public Works Contracting the increase has been from 22.1 per cent. to 39.6 per cent., and in Brick and Tile Making from 9.62 per cent. to 20.8 per cent. These are higher, sometimes considerably higher, than for the same trades in the country at large. In Public Works Contracting, however, the figures of the insured show an abnormally steep rise which can only be explained by quite recent attempts to provide employment on relief works and which in view of the later policy of restriction of public spending can only be regarded as indicating a considerable excess of labour supply over ordinary requirements.

The question of the future development of these trades would seem to be bound up, therefore, with the explanation of what, taking them altogether, is a late post-war decline. And this is a point which is best discussed by taking each trade separately, for though they have much in common there are also important differences which justify this separation. Building, both here and in the country generally, has declined with the completion of the numerous building schemes developed, with the help of state subsidies, by both municipal authorities and private builders. Apparently the demand for the better type of house has now been met. There are many who think it would be desirable to go on to the building of the smaller and the cheaper type; and the community has been hesitating upon the brink of a further campaign which would involve an attack upon slum clearance, but from which for various reasons, notably for reasons of economy, it has been deterred. Until such building campaigns are started, or until the numerous schemes—both private and municipal—which have been shelved owing to recent demands for economy are taken out again, then it would seem that Building must expect a continuance of the present depression. It has an ample supply of labour to meet such demands, for the persistently high level of the number of its insured workers suggests that it still retains men drafted in to meet the pressure of the early and the mid post-war periods. Unless, therefore, some decline in the number of its insured workers takes place it must be expected that its unemployment percentages will continue to rule high. One factor, extraneous to building itself, might however help. Some of its workers appear to pass fairly readily between building and shipbuilding. Some, therefore, who are at present registered under Building are doubtless of those whom a more thriving building industry pulled in the earlier post-war period from the more depressed shipbuilding industry. And it follows, therefore, that were shipbuilding to revive, there would be a reverse flow from building into shipbuilding and a corresponding reduction in the former's

unemployed. In Public Works Contracting the main cause of the violent fluctuation of the figures appears to be the beginning and then the cessation of a considerable amount of development work. Private undertakings are not now disposed to commit themselves or their capital owing to the uncertainty which is bred by a general trade depression, and public authorities are held back by the restraining hand of economy. It is a form of economic inhibitionism bred of lack of confidence and breeding lack of confidence from which trade revival alone can provide a means of escape.

Much the same conclusion as has already been reached in connection with these two major trades is applicable also to Brick and Tile Making. There is, however, the additional factor of foreign tariffs. 50 per cent. of the output of one large brick making concern ordinarily went, we have been informed, to Italy but a high tariff has reduced this trade almost to zero. In Stone Quarrying and Mining some expansion has been registered by that section producing tar macadam, but the section engaged in quarrying limestone for use in the iron and steel industries has experienced decline. One quarry has been closed and others have either reduced their staffs or are working short-time. In the Artificial Stone section a spurt upwards between 1923 and 1927 has been followed by a decline which, though considerable, has still not been great enough to bring the number of the insured down to the level of 1924. It has left its legacy in the shape of an apparently swollen labour supply and a 1930 unemployment percentage almost three times as high as any other recorded.

There are other forms of activity ancillary to building which might perhaps be recorded—the making of cement, and of whitening, the winning of clay, sand, and gravel etc.—but their numbers are so small and their relation to the main trades of the group so obvious that no point is served by going into any detail concerning them. If the main trades of the group revive they may expect to share too in any activity which may be developed, and this, it would seem, returning to the argument above, must wait upon a return of business and public confidence and a general trade revival.

(x) Food, Drink, and Tobacco Trades.

Partly because they represent a variety which most other trades lack, partly because they expand when other trades generally decline, and partly because they offer a considerable proportion of their total demand for labour to female workers, these industries, in spite of the relatively small total they employ when compared with the basic industries of the Survey Area, are important. Against this, however, has to be recorded the fact that in every case, except the manufacture of salt, the proportion of the insured in these industries to the total insured in the Survey Area is considerably less than in Great Britain and that in most cases the percentage of unemployment in the Area has generally ruled higher

than for the same trades in the country as a whole. The tendency has been however for them to reduce this gap. As a group, but excluding salt, they represented almost 19 per 1,000 of the total insured population of the Area in 1924 and about 21.5 per 1,000 in 1929. Against this, Great Britain showed the greater proportion of roughly 44 per 1,000 in 1924 but declined in 1929 to 42.5 per 1,000.

Excluding salt manufacture, which is important enough to merit separate treatment, they display a power of expansion which they carry well into the depression period and which is a much larger proportionate increase than that registered for the country as a whole. They also display, however, the characteristic Survey Area feature of failure to take employment with them. The figures of the insured continue to increase even when employment begins to show a relative decline which, though taking it below the level established in 1929, means still a level of employment higher than that of 1924. This general increase, however, masks important variations. Not all sections of the group move in the same direction, for the Drink Industries show a persistently sluggish tendency which carries them only 2 points above their 1924 level even in their best year and sees them fall below the 1924 level in the last three years, and the Tobacco section follows them into decline with an index for 1930 of 84 as against the 100 of 1924. The Food Industries not separately mentioned, too numerous to mention would perhaps be the better title, including as it does, fish canning, meat preserving, pickle and jam making and the like and Cocoa, Chocolate, and Sugar Confectionery with jumps relative to 1924 of 71 points and 27 points respectively, provide the main explanation of the rise. Bread and Biscuits, and Grain Milling with the quieter movements of 8 and 7 points respectively follow them upwards. In the main these relative groupings are found also in the indices of the employed. It is significant that the industries which decline or which, as, for example, Bread-baking, only experience a relatively slight upward movement are those which are confined almost entirely to the Area for their market outlet and that those which have a national connection as well as a local connection are precisely those industries which expand. While all would benefit by general trade improvement, it would appear that improvement in Beer Brewing, Grain Milling, and Bread-baking demands as its prerequisite, improvement in the Survey Area.

There are no peculiar disadvantages attached to operation in the Survey Area—except perhaps in the Tobacco Industry which is a good distance from the points of import; and there are also no special advantages except perhaps in the case of fish canning. While there is no reason to expect that this Area will become a specialist food making centre, there are signs that its share of these trades is increasing and, with an improvement in trade, expansion should

be general through all these different sections. While this may reasonably be expected, however, it would not be reasonable to expect that there would be an expansion in employment proportionate to the expansion in sales. Many firms have already stated that they could produce more without proportionate additions to their staff and there is little doubt that with expanding sales and increased receipts firms would be induced to instal machinery from the buying of which the present condition of trade deters them.

In brief, while no reduction in the present volume of labour employed in these sections is likely to occur, it would be definitely unsafe to expect, certainly in the next few years, any considerable expansion in employment even granted a return to better trade.

We must now turn to a consideration of salt manufacture. The validity of separate treatment is apparent from the first two facts to be stated. In 1921 the Survey Area contained 17 per cent. of the workers in this industry in England and Wales, and of its insured workers in 1924, two-thirds were male. It is mainly concentrated on Tees-side and the reason is natural advantage. Though now a large proportion of the industry is engaged in the making of refined salt, the basic fact behind development has been the proximity of the brine wells of the Tees estuary. The two forms of activity, namely the making of coarse and refined salt still go on, but their respective labour demands are very different for whereas in the former, workers are almost entirely males, in the latter a large proportion of females is employed. Depression has hit both sections severely, but the very much higher percentage of unemployment amongst males (47.0 in 1931) as compared with that for females (12.0 for 1931) suggests that it has been felt more severely in the coarse section than in the refined section. It is again significant that it is the latter branch which has the national and in this case an export market and the former branch which is confined to local markets which are heavily depressed. The refined section is thus showing remarkable stability in a period of depression and has thus no need to wait for that return of prosperity in the Area, upon which the coarse section would seem to be particularly dependent. Some labour displacement has occurred, particularly in the refined salt section, and it is clear that greater output could be secured without proportionate increases to staff, but it is to trade depression that the greater part of the unemployment recorded must be attributed.

(xi) **Minor Industries.**

The minor industries in the North East Coast Area include about 54,000 of the insured population. Of these, over 15,000 are in the catering trades (Hotels, Boarding-houses, and Clubs). The woodworking trades and the clothing trades have each over 6,000. Another 6,000 are in a variety of small trades; and the minor

metal trades come next with 5,160. Laundries, including dyeing and cleaning, have about 3,800 insured workers; textiles come next with 3,160, of whom more than half are employed in making rope and cord; glass has rather more than 2,000; pottery has under 1,000. The insured persons among those who are engaged in Commerce, Banking, Insurance, and Finance numbered 2,840 in 1929.

These numbers are not large, and in many cases the proportion of insured workers attached to the industry is less than the corresponding proportion for the whole country. They constitute, nevertheless, an important part of the economic activity of the Area; and some of them may be capable of expansion.

Those in which the numbers insured appear to be growing are the catering trades, fishing, laundries, and woodworking. There is also a considerable rise in the numbers attached to the group of unspecified trades. There is a slight decline in the numbers insured in leather, clothing, glass, and pottery.

Housebuilding contributes to the activity of all the woodworking trades; and recently there have been new developments in furniture making at Walker, Pelaw, and Sunderland. The laundries were largely reorganized about 1923 and have expanded since then. The Co-operative Wholesale Society has a new leather factory which employs about 150 persons, chiefly women; and one old leather-making firm has developed a new manufacture of acid-free dressed skins. There seems to be room for an extension of skin-dressing in the Area, since, a bag factory obtains most of its skins from outside. The decline in glassmaking, an old local industry, is said to be due to foreign competition; but as this is apparently not true for the rest of the country, there may have been some want of enterprise in meeting local demand. Bottling firms certainly get a considerable supply of bottles from outside. But some bottle-makers do well. A glassmaking firm in Sunderland has had great success with a new proprietary kind of glassware.

In textiles, the important products are hemp, rope and cord, which represent 57 per cent. of the insured workers in the trade. No processes for textile manufacture are carried on in the Area; no cotton, jute, or lace is made, and hardly any hosiery or linen. While in the clothing trade the net output per head is stated to be £128 as against £156 for the whole country, in textiles the output per head is stated to be £210 as against £175 for the whole country.

The production of wire and of rope was affected by the scheme of rationalization formed in 1929. In the firms which remained outside the combine there has been some increase of activity, for example, in the manufacture of wire mattresses.

Glass, leather, the minor metal trades, fishing, and woodwork mainly employ men. Catering, clothing, laundries, and textiles are chiefly women's trades. Pottery is roughly half and half. Out of every 1,000 insured women in the Area, about 100 are in catering, and 50.8 in clothing. A large number of women are in domestic service. According to recent figures women formed 51 per cent. of pottery workers, 30 per cent. of glass workers, 24 per cent. of leather workers. Even in fishing a few women are employed. It is generally true that in the North East Coast Area there is a large potential supply of women's labour which could be made available in a great variety of trades.

In these minor industries the percentage of unemployment is high, with a marked increase in 1930 and 1931. It is highest in the group of unspecified industries: 57.3 in 1931. In fishing it rose from 17.2 in 1923 to 32.5 in 1931. In the minor metal trades it was 41.4 in 1931. In the clothing trades which are prosperous in comparison with some other industries, the rise was from 9 per cent. in 1923 to 17.9 per cent. in 1931. In the case of catering, wood-working trades, and fishing an increase in numbers insured has been accompanied by a decrease of employment, which suggests that in these trades there is an excess of insured persons over any possible needs of the industry.

Details of changes in numbers insured and in percentages of unemployment are given in the memoranda dealing with these minor industries. In general we find that the numbers attached to these trades are already sufficient, so that they cannot be expected to absorb additional workers. In some of them there is clearly a redundancy of insured labour. Unemployment in all these trades is much greater in this Area than for the whole country; and there is, on the whole, more indication of contraction than of expansion.

(xii) Transport (Including the Shipping Industry).

The principal questions to be discussed in connection with the three transport agencies of the North East Coast (shipping, rail, and road) are firstly the change in the volume of goods to be carried, secondly the transference from one agency to another and thirdly the effect of such changes on employment.

Available figures seem to indicate that world sea-borne trade has increased by at least 10-15 per cent. between 1914 and 1930. Not only is British shipping carrying a smaller percentage of this increased world trade but also the trade of the United Kingdom forms a smaller percentage of the total. So far as the North East Coast is concerned, the general tendency of recent years has been for imports of food, drink, and tobacco and of manufactured articles to increase, the latter at least since 1924, and for imports of raw materials to decrease. Exports mainly consist of coal and coke, iron and steel manufactures, ships and

boats, and chemicals. With the exception of ships and boats, which show exceptional increases in 1929 and 1930, exports are decreasing in value and in actual quantity, though chemicals still show up well as compared with 1924. Further details of the trade of North East Coast ports are contained in the separate memorandum. We find that the dependence of the Survey Area on the coal and basic industries is expressed in the proportion formed by exports of coal and coke, iron and steel manufactures, and vehicles of all kinds. Any drop in the market for such commodities hits the Survey Area much more severely than the country as a whole, yet we find at the same time that there is little diminution in the imports of food, drink, and tobacco, and of manufactured articles. To these facts may be ascribed the fall in the trade balance at North East Coast ports from £15.12 million in 1924 to £10.60 million in 1929 and to £11.69 million in 1930. If one excludes the value of exports of ships and boats, which we feel do not represent the true present position in the shipbuilding industry, the balance fell from £14.15 million in 1924 to £5.57 million in 1929 and £3.84 million in 1930, but it would not seem that, on a quantity basis, the North East Coast ports are relatively declining.

The shipping tonnage using the North East Coast ports and the employment capacity of these ports depend to a very large extent on the state of the coal export trade and rise or fall with it. In 1930 it is estimated that 40 per cent. (46 per cent. in 1924) of vessels departing from North East Coast ports carried coal and coke in the foreign trade, 21 per cent. (15 per cent. in 1924) in the coastwise trade—i.e., in both years 61 per cent. in all. The corresponding figure for all United Kingdom ports is 19 per cent. Again, while 82 per cent. of all vessels arriving at North East Coast ports arrive in ballast, the similar figure for the whole country is 44 per cent. It is held on the Tyne that a good coal year means a good general merchandise year and this view is borne out by estimates which may be made of the tonnage required to carry general merchandise and agrees with the conclusions arrived at from the figures of imports and exports.

The shipping industry is a mobile one and it is therefore more difficult—if it is not impossible—to deal with the share of the North East Coast in it than it is in the case of the relatively fixed industries, such as coal mining, engineering, or shipbuilding. There are 87 shipowning firms whose main offices are situated in the Survey Area. These firms together own 449 vessels, of a total gross tonnage of 1,471,302, which gives an average of 3,277 gross tons per ship; and the ships are of an average age of 10 years, comparing very favourably in this respect with the rest of the British Mercantile Marine. The firms are, however, in the main small firms. Only 18 of them own seven or more vessels and the great majority own only one to four colliers. The largest firm owns 29 vessels of a total gross tonnage of 139,223. The North Eastern

fleet forms rather more than 7 per cent. of British owned tonnage, whilst the proportion of British trade dealt with at North East ports is about 4 per cent. measured in value, but about 13 per cent. on the basis of the tonnage using the ports.

The number of men employed in the Dock, Harbour, River, and Shipping Services in the Survey Area, as measured in June each year, has varied since 1923 from about 15,300 to about 20,500, whilst the number attached to the industry, as measured in July each year has varied from 22,400 to 28,700. One must bear in mind, however, the tendency of labour in other industries when unemployed, to move to dock and shipping services. From the correlation between employment and the flow of traffic at the docks, we feel justified in estimating that the employment in these services combined will reach 20,000 at least in a prosperous year.

The present depression in the British shipping industry seems to have begun about April, 1930. The position improved very slightly towards the end of 1930, but became definitely worse at the turn of the year and has grown steadily worse throughout 1931. Freight rates have been very slightly better in 1931 than in 1930, but the tonnage laid up both in British and in world ports has greatly increased. In October, 1931, approximately 15 per cent. of both the British and the world's mercantile fleet were lying idle in port.

To some extent the depression in shipping is due to an expansion of world tonnage in excess of demand. World tonnage has increased by no less than 22.4 per cent. since 1920, though British owned tonnage has increased only 10.8 per cent. The increase is therefore in the main an increase of foreign fleets. Prior to the War this country owned 40 per cent. of the world tonnage afloat; to-day she owns only 29 per cent. The United States, France, Greece, Holland, Italy, Japan, and Norway have all considerably increased their fleets. The increase has, in many cases, been dictated by national sentiment and fostered by State subsidies and loans. Apart from this artificial increase, the growth of world tonnage during the last ten years might be considered as normal, keeping pace with the growth of international trade. This view would seem to be supported by the fact that during the period 1924 to 1929, the volume of tonnage laid up idle in port was not abnormally large. We are therefore inclined to take the view that too much stress should not be laid on this growth of world tonnage as a cause of the present depression. The chief causes, it seems to us, are on the side of demand, as shown in a shrinkage of world trade since 1929, partly in consequence of increased barriers to trade in the form of increased tariffs, but chiefly to the slump in world prices, and general monetary instability. If this be so, the present position is but one of the phases of the trade cycle, and therefore a recovery may be looked for, as in 1924, following the post-war depression of 1921-1923.

In this connection we would refer to the Memorandum by Sir Westcott Abell, in which he makes an estimate of the average

demand for world shipping up to 1940. A brief summary must necessarily fail to do justice to Sir Westcott Abell's argument. All that can be said here is that the curve seems to indicate a demand of 59,500,000 tons, excluding tankers, about the middle of 1932, and of 63,400,000 at the middle of 1934. After 1934 he estimates that the demand will remain stationary, or even fall somewhat, for a period of about four years.

So far as the shipping industry of the North East Coast is concerned we find that it is dependent for its prosperity chiefly on the volume of the export coal trade, and to a lesser extent on the activity of the iron and steel trades. Any measures that could be taken to revive these trades would bring a measure of prosperity to the shipping industry of the North East Coast and through it, greater activity in the shipbuilding and marine engineering industries of the Area.

One further point emerges here. If in the near future, the hydrogenation or any other process for the conversion of coal into oil should become commercially profitable on a large scale, a decline in the amount of shipping required may be looked for. Imports of oil into this and other coal producing countries would fall, and with them the demand for oil tanker shipping. Whether this would result in our exporting oil instead of coal it is impossible to say, though we should doubt very much that this would be the case, since there seems little likelihood at present that the cost of production of oil from coal would be less than the price of natural oil.

To measure the extent to which the fall in railway tonnages is due respectively to trade depression, to road competition, to changed demands or to the rationalization of the basic industries which by combination of firms on a large scale both horizontally and vertically has reduced railway haulage, is a task which is well-nigh impossible, yet the combined effect of all factors is clearly shown by the fact that the total tonnage forwarded in the Survey Area fell from 45,563,000 tons in 1924 to 41,690,000 tons in 1930 after rising to 47,598,000 tons in 1929. Measured as a percentage of the total traffic forwarded in the country, the proportion originating in the Survey Area rose from 13.5 in 1924 to 14.3 in 1929 and fell to 13.6 in 1930. It is thus evident that the Survey Area lost in 1930 due to trade depression any comparative advantage it had gained between 1924 and 1929. This may be ascribed to the preponderance of traffics in the coal and mineral classes which form approximately 80 per cent. of the forwardings in the Survey Area, a conclusion which is borne out by the fact that the percentage of employed in the basic industries who were engaged in the Survey Area rose in the same way from 15 in 1924 to 15.6 in 1929 and fell to 15 in 1930.

If we attempt to analyse the fall between 1929 and 1930, we find that shipment coal traffic contributed the greatest actual fall but that the largest proportionate fall was one of 20 per cent. in coal and raw materials for blast-furnaces and steel works. These traffics

are of such a nature that road competition is of less importance than in the case of general merchandise. In the latter we estimate that half the present fall is due to trade depression and half to road competition. It is impossible, however, to single out individual traffics as liable to road competition. All we can say is that the fall is general, nor is this surprising since traffics not hit directly by road competition are just those likely to be affected by trade depression in the basic industries.

When we attempt to carry the position up to date we find that the slump of 1930 took place roughly in March, 1930, and continued till August. By then it appeared as if a new low level had been found but since March, 1931, the world depression is shown to be making an effect on coal shipments. These are still falling though traffic for internal purposes seems to have actually dropped to its full extent by August, 1930, and to be now maintaining the level it then reached.

It is estimated that the London and North Eastern Railway employed 35,550 men in the Survey Area in 1924 and 32,210 in 1930. If we assume that employable capacity can be correlated with traffic statistics, and that 80 per cent. of the total traffic is outside the effect of road competition in the immediate future, while only half the fall in the remaining 20 per cent. is due to road competition, then we may anticipate that the increase over 1930 figures in employable capacity will never exceed 66 per cent. of the fall between 1924 and 1930. This indicates a probable employment of 34,000.

There are no reliable statistics of the amount of traffic going by road, though it has been deduced as a very rough estimate that 1,225,000 tons are now carried per annum in the Survey Area. The competition of road with rail is widespread and general, and there appears to be no sign of its having reached its maximum on the goods side. In this respect conditions do not differ in any marked degree from those existing in other parts of the country. It is increasingly apparent that the whole question of the future relationship of rail and road transport is a national rather than a local problem, and no solution can be found by mere reference to local conditions in a comparatively small area. All the methods which can be adopted by the railways to meet the problem in the way of lowering rates or altering their classification are only scratching the surface.

Increase in goods transport by road has led to a steady increase in the number both insured and employed, though more labour has been attracted than the industry has been able to absorb in permanent employment. An increase of 3,160 persons insured between 1924 and 1931 has been accompanied by an increase of 1,221 persons unemployed and there has been an increase in the employable capacity of the industry of about 1,939. We estimate on grounds discussed in the Memorandum, that the number employed will reach 7,000 by 1936 from its present figure of 6,035.

In road passenger transport, employment is not so haphazard and the industry is better organized. In consequence there has not been the same surplus of supply over demand. Between 1924 and 1931, there has been an increase of 4,280 persons insured, of these, 3,768 have been absorbed and there has been an addition to unemployment of only 512. In this case, however, the saturation point appears to have been nearly reached and employment capacity may be expected to increase from 8,980 to about 9,500, but not further.

(xiii) Public Utilities.

The North East Coast Area is well supplied—at least in its more populous districts—with water, gas and electricity. Water, as is the case throughout the country, is in the hands of *ad hoc* bodies representing large districts. The Newcastle and Gateshead Water Company and the Sunderland and South Shields Water Company in 1927 supplied between them a population of nearly 1,200,000 with about 40 million gallons a day. Large areas are also supplied by the Tees Valley Water Board and the Durham Water Board. Two towns have municipal systems. The amount of water consumed in domestic use is continually increasing, as new houses are built.

The use of gas has increased during the last thirty years in the whole country and also, but in a less degree, in the Survey Area. The consumption per head is also less in this Area, where coal is available at low prices and is generally free to miners. While the consumption for the whole country rose 100 per cent. from 144,000 million cubic feet in 1902 to 290,000 million in 1930, the corresponding figures for the North East Coast are 7,265 and 12,275 million cubic feet, or 70 per cent.

There is a very large number of separate undertakings, some of them being quite small. The most important is the Newcastle-upon-Tyne and Gateshead Gas Company, of which details are given in a separate Memorandum. A few towns have a municipal gas supply; but historically gas has developed as a public utility under private enterprise, hence the numerous gas companies. Some of the undertakings buy all their gas from coke ovens, and the amount used is increasing, thus effecting an economy of labour in gas works. The residual coke made at gas works is exported. Gas is not as important to industry in this Area as it is in districts where the smaller trades are numerous; but it is used in metallurgical heating, in the manufacture of zinc oxide, varnish, glass, and confectionery and in bread-making.

Municipal electricity undertakings are found in many towns to which gas is supplied by companies. A few make their own electricity; but as a rule the undertakings obtain their supply in bulk from the Newcastle-upon-Tyne Electric Supply Company, Limited and its nine subsidiary companies, which are described in a separate memorandum. The Central Electricity Board supplies a certain amount to industry through other undertakings.

In the last ten years there has been a remarkable development of electricity in the Survey Area, both in industrial and in domestic uses. In years of bad trade the fall in industrial demand was largely compensated by an increase of domestic consumption, stimulated by reduction of charges and by the policy of allowing consumers to pay for wiring by instalments. The great increase of small consumers is shown by the striking fall in the average annual number of units consumed per consumer from 590 in 1921 to 382 in 1930. During the same period the total number of consumers rose from 23,000 to 98,000.

The extent to which the various industries in this Area use electricity is indicated in the separate Memorandum. In ship-building, electrification is complete; in iron and steel it may have been checked by the large amount of capital required to effect the change. Nearly all the large collieries are now supplied with electricity; some of them, however, still have their own generating plant. Quarries take an increasing amount as the distribution system extends. In the smaller industries there are indications of new uses of electrical supply. A soap manufacturer is producing a new material, one small company is making zinc oxide, another, sheet steel bracing pieces, another, patent concrete bricks—all these are new activities in which electricity is being utilised. Paper-making, paint-making, woodworking, confectionery making firms, and laundries, are all using electricity. It is reported that many farms now take electrical supply for lighting, heating, threshing, root-cutting, milking and other purposes.

In general, the quantity supplied is increasing, the variety of uses extending, the cost per unit falling. Darlington Corporation sold 15,373,000 units in 1926 at a cost of .55d. and 26,600,000 units in 1930 at a cost of .37d. In Sunderland 21,054,000 units were sold in 1926 at a cost of .84d. per unit, and 37,500,000 units in 1930 at a cost of .63d. In the smaller undertakings the cost is higher, but in all cases except one there is a marked reduction in the later year. Charges are adjusted by a variety of sliding scales and special rates. The usual price for domestic purposes is from 5d. per unit downwards, according to the amount consumed. For prepayment meters the price is 6d. per unit. Power charges range from 2½d. to 1½d. Shop lighting has increased greatly and special rates are often fixed for shops.

The number of persons employed in Public Utilities in the Survey Area is stated to be rather over 7,000, which is about 1.5 per cent. of the total number of employed insured workers. There is no great variation in the number from year to year. Some indication of the relative demand for labour in the three services may be found in the figures given by Darlington Corporation, which supplies all three. In 1925, 727 men were regularly employed, which included 179 for gas, 36 for water, 64 for electricity. In 1931 the number was 883—191 for gas, 47 for water, 80 for electricity. In the Newcastle-upon-Tyne Electric Supply Company and its

subsidiary companies, the total number of employees rose from 1,604 in 1921 to 2,472 in 1930; but the increase was in the salaried workers. The skilled workers numbered 559 in 1926 and 516 in 1930, and the unskilled 871 in 1926 and 888 in 1930. The same point may be illustrated by grouping some of the important undertakings in all three services. Taking 100 to represent the total number employed in each in 1925, we find that during the six succeeding years the highest number for water is 92 in 1931, for gas 137 in 1929, for electricity 127 in 1930. Yet during this period the consumption of all three increased greatly.

Though the Public Utilities are not likely to absorb much additional labour in the near future, they are important as maintaining a steady, though small, demand for men's labour. Very few boys and still fewer girls are employed. Some women are required as clerks and as cleaners.

The percentage of unemployment is much lower than for all trades taken together, and varies from 10.2 to 13.3 in the years from 1923 to 1931. Temporary labour, chiefly unskilled, is always demanded by these trades when new mains have to be laid; and this fluctuating element is probably mainly responsible for the unemployment. Taking into consideration the fact that in all three services output could be increased with little or no increase of numbers employed and the probability of some economy of labour arising from amalgamation or from new methods, we consider that the number of persons now attached to the industry is sufficient for the demands of the next few years. The increased demand will be for temporary rather than for permanent labour and will depend on the extension of the existing systems of supply. This again is influenced partly by industrial development, and partly by the rising standard of health and comfort.

(xiv) Distributive Trades.

The Distributive Trades differ from other industries in that they are engaged in the final stage of production—the placing of products in the hands of their ultimate consumers. This is an activity which can never be arrested; distributive traders compete with one another, but not with other trades, except to a small extent, when they make goods that they sell. As long as every household has some form of income—and this is secured by Public Assistance and Unemployment Insurance—retailers are occupied in selling goods. On the other hand, activity in dealing cannot be regarded as a compensation for depression in productive industry.

The available figures show a large increase in the number of persons insured and employed in the distributive trades of the North East Coast Area between 1923 and 1931. The causes which at first suggest themselves are growth of population or of purchasing power. But in this Area population has increased very little. It is impossible to judge from changes in wage rates and the falls in prices whether purchasing power has declined or not. It

is true that there has been some redistribution of population within the Area, and that such movements are reflected in changes in the number employed in different centres; but this does not explain the increase in the total number employed. In the Memorandum this question is considered at length.

Two points alone are considered here. First, a fall in purchasing power need not cause a reduction in numbers employed. Buying is done more carefully, smaller quantities are taken at a time, cheaper goods are sought for and chosen; such changes do not reduce the labour involved in selling. Again, as time goes on, the variety of goods and services offered to consumers increases; and this change, which brings new demands for labour, is not arrested in a period of bad trade, when every expedient is adopted in the hope of inducing customers to buy more.

In the second place, the organization of retail trading determines the amount of employment. Economies of labour can be effected by the use of modern fittings and by stocking branded goods and packet goods. Apart from such economies, costs cannot be kept down by reducing the number of persons who sell and deliver goods; for such action would drive customers away. Success is achieved by engaging cheaper labour, by skilful buying and advertising, by offering new attractions, by getting trade away from rivals in every possible way. A business which can succeed in all this can prosper even in a period of depression. We have found that though some traders have failed, other firms have done well. In the main, there are three kinds of business which are succeeding now in the North East Coast Area. (1) The well-established, well-managed firm which has regular customers and gives them what they want. (2) The large firm not as yet too large to gain by expansion and able to expand even while trade is bad. (3) The multiple shops financed from outside the Area and economically organized, with the additional advantage that their owners can afford to buy up existing businesses and to wait some time for profits. There is thus a certain transference, the extent of which cannot be definitely ascertained, from one type of business to another type better able to succeed in difficult conditions. The Co-operative Societies, very numerous in this Area, have not lost ground, though they are not developing as they would have done in a period of good trade. There is a great deal of buying, paid for by instalments, from agents, throughout the industrial and mining districts, and the general depression has not checked this; so far as we are able to judge. It is the small retailer who has suffered most.

In general, it is true to say that the number absorbed in the distributive trades depends on movements of population, on general prosperity, and on business organization. It was stated to be 75,000 for the whole Area for 1931. It has increased considerably since 1923; since 1927 the increase has slowed down. We think it unlikely that in five years' time the number employed will be more than 80,000.

(xv) Labour.

In so far as the number of persons engaged in industry is a measure of industrial importance, the North East Coast has been losing ground in the country during the past ten years.

The proportion of the total population of England and Wales living in the Survey Area was increasing during the first twenty years of the present century. At the Census of 1901 it was 6.1 per cent.; in 1911, 6.3 per cent.; in 1921, 6.5 per cent. But in 1931 it had decreased to 6.25 per cent.: the total population of the Area being then 2,500,000.

Based on its coal, iron and waterways, the economic organisation of the North East Coast is of the heavy industry type. As a result the proportion of male workers is greater and of female workers less than the average for the country as a whole. The relatively small number of women and girls in industry is reflected in the fact that the proportion of occupied persons in the population is less than in England and Wales as a whole. In all these respects the position of the Area has been changing since 1921.

The Unemployment Insurance statistics show that while the number of insured males (aged 16-64 years) increased from 604,700 in 1923 to 613,200 in 1931, these figures represented a decline in the proportions of the aggregate for Great Britain from 7.5 per cent. to 6.8 per cent. In the same period the number of insured females rose from 73,380 to 98,840 and the proportion of the aggregate for the whole country from 2.65 per cent. to 2.83 per cent. The total insured population (males and females) increased from 681,120 to 712,090; but relatively to Great Britain as a whole, the Survey Area steadily lost ground, the proportions falling from 6.25 to 5.7 per cent.

During the period covered by the Survey, 1924-1931, the changes in industrial distribution within the North East Coast Area have been considerable. In the great group of industries based on coal, iron and the rivers, there has been a heavy reduction in the aggregate number of insured workers. At the beginning of the period the total number of insured workers attached to this group—Coal, Iron and Steel, Engineering, Shipbuilding, Chemicals, and Shipping and Waterside services—was 437,460; nearly two-thirds of the insured population of the Area. After the industrial troubles of 1926, which hit the Area heavily, the number remained fairly steady, at about 6.0 per cent. less, until the world-slump of 1929-1931, when it fell to about 9.0 per cent. below the 1924 level. In 1931 the proportion of the aggregate insured population of the Area attached to these industries as a group had fallen to a little more than one-half. Inside the group there were great variations. In common with the rest of the country there was a considerable movement away from coal mining and iron and steel manufacturing, which continuously declined throughout the period. Engineering and shipbuilding were more irregular in movement,

but did not lose so much as the former groups until after 1930. The establishment of the Imperial Chemical Industries' works at Billingham led to an abnormal influx to the chemical industry, while the shipping and waterside services gained considerably both in the Area and relatively to the country as a whole. The other principal manufacturing and consumption industries and services all showed considerable increases, most marked in the distributive and catering trades and in passenger and commercial road transport. The latter group appears to have gained largely but not solely at the expense of railway transport.

In employment the fluctuations were, naturally, greater and as the statistics available provide figures only for a date in June in each year, they are less reliable as a guide. In the Area as a whole the number of employed insured workers had almost regained the 1924 level by 1929. But the Area's share of the aggregate employment in Great Britain had fallen from 5.9 per cent. to 5.5 per cent. In every year the percentage of unemployment on the North East Coast has been markedly greater than in the country as a whole. The slump of 1929-1931 hit the Area very heavily and there was a steep drop in the employed insured population of 120,000, or 20.0 per cent.

The movement of employment in the basic industries group presents a dark picture. Employing, in 1924, 376,000 workers, or 63.0 per cent. of the employed insured population on the North East Coast, it suffered severely from the troubles of 1926. In 1929 it was still 8.0 per cent. below the 1924 level. The world depression of the next two years dealt this group as a whole a heavy blow, and at June, 1931, the number of employed insured workers was only 218,180, or 42.0 per cent. less than in 1924. Coal, Iron and Steel, and Shipbuilding suffered very severely; Chemicals employed 9,000 less than in 1929; and for probably the first time in modern industrial history the whole group found work for less than half the total employed in the Area. In the other principal industries and services employment increased generally over the period. The increases in the Distributive (25 per cent.) and Catering Trades (27.5 per cent.) and Road Transport (65.5 per cent.) were remarkable. The 1929-1931 slump, while it brought about a pause in the growth of the lighter manufacturing industries, had no apparent effect on the distributive, catering and transport services.

As a result of this contrasting movement of employment in the heavy industries on the one hand and the lighter industries and services on the other, the employment of insured women and girls increased absolutely and, of course, relatively to men and boys. By 1929 the number in employment was 12.0 per cent. greater than in 1924, and that level was maintained during the general depression of the next two years. More than half of the insured females at work in the Area were employed in the Distributive and Catering Trades.

From the evidence before us of the changes in the distribution of insured workers among the various industry categories and in the movement in employment, it appears that, speaking generally, the great decline in the heavy or basic industries on the North East Coast has moved with the fall in the country at large. They were hit more heavily in the depressions of 1926 and 1929-1931 owing to the relative importance of the export trade; but taken all over, the Area held its own with the rest of Great Britain in Coal, Iron and Steel, Shipbuilding, and Shipping. It seems clear, therefore, that as at present constituted, the prosperity of the North East Coast Area depends largely on the condition of the overseas trade of the country. The expansion in the manufacture of goods mainly for home consumption—furniture; printing and paper; food, drink and tobacco—and in the distributive and catering trades, suggests a relative rise in the standard of life for the mass of the people despite the general depression in trade. It has brought with it greater opportunities for women in industry, in itself an excellent thing, but taken with the decline in male employment it means a net reduction in the Area's contribution to the economic wealth of the nation. In our view it is highly improbable that any expansion of these industries and services can take place on such a scale as to make up for a continued loss in the heavy or basic industries for which the Area is so favourably situated. It is on these that Britain's position in the economy of the world depends. If that goes permanently it seems to us that the general standard of life in the country must fall and with it that of the workers on the North East Coast. If not, then there is no reason for thinking that the North East Coast will be any less able to play its part in the future than in the past. That does not mean that effort should be spared to expand the existing lighter industries and services or to establish new ones. The Area has suffered more heavily than most parts of the country mainly because its economic life has depended on the employment provided by a few industries engaged in producing heavy capital goods and therefore subject to considerable fluctuation even in normal times. Considered as a unit it would gain from the existence of a greater variety of industrial activity and the increased production of consumption goods and extension of these services less subject to periodic fluctuations.

We have been asked to form if possible an estimate of the maximum demand for and supply of labour on the North East Coast during the next five years. As will appear from the discussion of the several principal industries and services in the foregoing parts of this Report there is, unfortunately, no visible prospect of any considerable improvement. The most that is looked for in the basic industries is a recovery to something like the level of 1929. The other principal industries and services may be expected to continue to expand though, it may be, at a slower rate. On

the inadequate data before us, consisting of statistics of the movement in employment during the period 1924-1931 and the collected opinions of employers and others concerned in the various industries and services, we estimate the maximum demand for labour likely to arise in the North East Coast Survey Area during the period 1932-1936, at 622,000 workers of all classes—532,000 men and boys and 90,000 women and girls. 363,500 (including 4,600 women and girls) of these are allocated to the basic industries group. This is not an average but a maximum.

There is no evidence that in the basic industries the demand for skilled labour will materially alter in relation to other classes. Whatever displacement of labour has been brought about by changes in organisation, methods, and processes, does not appear to have reduced substantially the proportion of skilled labour employed. There is little mass-production in the Area and so less room than in other parts of the country for the displacement of skilled labour by semi-skilled automatic machine-minders. Mechanisation has undoubtedly displaced labour by increasing productivity, but the effect appears to have been fairly equally spread over all classes of workers.

Difficult and highly speculative as the above estimate of the demand for labour in the immediate future has been, an estimate of the supply is no less hazardous. Taking into account the movement in the number of insured persons over the past seven years, the decrease in the birth-rate during the years of the War, and other factors the effect of which can be little more than guessed, we venture to estimate as a mean of the movement, during the next five years, a total of about 612,000 men and boys. This is a reduction of 1,250 on the 1931 figure. We have taken a mean, as for the purpose of the Survey we have to relate it to the maximum demand estimated above for which no date can be definitely fixed. The potential supply of women and girls is so considerably in excess of both the present and future demand that any estimate would be as useless as it is difficult.

We do not anticipate any shortage of specialised skilled labour, though the margin here is probably less than for labour in general and if there was a decided boom much in excess of the estimate we have made, a shortage in certain classes of skilled workers might occur.

On the basis of these estimates of the maximum demand and minimum supply in the case of men and boys, 532,000 and 612,000 respectively, there would appear to be a surplus of 80,000. The minimum percentage of unemployment would be 15.0. Allowing a margin of 3.0 per cent. for the normal floating movement of workers, there would be a redundancy of men and boys on the North East Coast in the next five years of about 64,000.

If this redundant population of male workers is dealt with by means of the introduction of new industries or transfer to other

areas, an important factor will be the degree of mobility in the existing industrial population. The experience of the Transfer Scheme and Employment Exchange Clearing Houses in the Area and the analyses we have made of the movement of insured persons inside and into the Survey Area during the past seven years go to show that no exceptional difficulty in this respect should be encountered. Workers appear to move freely enough, provided they are satisfied that it is to their pecuniary advantage to do so. Territorial and industrial mobility is fairly high. Occupational mobility is naturally less. So far as general labour is concerned, change of occupation presents no serious difficulty and is fairly common. Skilled occupations are a more serious problem. The relatively simple and highly specialised character of the heavy engineering and shipbuilding industries on the North East Coast tend to mark deeply the lines of demarcation between the skilled trades, and while territorial and in some cases industrial mobility is fairly common, change of occupation involving entry into another skilled trade is very difficult and rarely occurs.

If the difficulties that may arise in any reorganization of industry in the Area are to be solved, it can only be done by co-operation between employers and employed. The machinery for such co-operation exists. The large proportion of skilled workers and the comparatively small number of large industry groups in the Area has made possible and produced a high degree of organization on the part of both employers and employed. The machinery for settling disputes in the heavy industries, coal, iron and steel, engineering, shipbuilding, and in such services as electricity supply is excellent and on the whole works well. Speaking generally the relations between the two sides are good, better on the whole than in some other areas. But we cannot shut our eyes to the fact that while both parties have a common interest in the industrial prosperity of the Area, each has interests which under the present organization of industry must inevitably come into conflict. Whatever advantages may be claimed for the existing organizations the friction caused by that conflict must be considered a liability to be counted against the assets. The conditions which during the War necessitated the special labour arrangements sanctioned by the Government, still exist and in the present crisis in the economic fortunes of Britain and of the North East Coast in particular, some similar method may be necessary. The experience of certain efforts to secure co-operation in meeting the difficulties of recent years, made by the industries themselves, has shown that even where considerable agreement as to the steps necessary has been arrived at, neither party has been sufficiently assured either of the good-will of the other or of the efficiency of the schemes proposed to protect its particular interests to make co-operation effective. It is, however, a great advantage that on the North East Coast the machinery exists and that the difficulties in the way of using it in co-operative

efforts to remove internal barriers to economic and industrial progress are at least no greater than elsewhere.

(xvi) Effects of the Suspension of the Gold Standard.

Business men in the North East Coast Area appear to have shared in the expectation that the suspension of the gold standard in September, 1931, would affect the trade and industry of the Survey Area in much the same way as it would affect the trade and industry of the country as a whole; that, in short, imports would tend to diminish and exports to increase; and that the stimulus to our export trade would be especially felt in such an area as that of the North East Coast.

In a quite general way this may have been, and probably has been, the case; or at least the tendency has been there. But it is difficult to give any definite evidence in support of this view; and judging from the replies of business men to our inquiries, one can only come to the conclusion that expectations have not been realised to any appreciable extent, except possibly in certain branches of the coal trade.

A large part of the trade through the North East ports has been with the Scandinavian countries, and these countries were among the first to follow our example and go off the gold standard. The value of their currencies in terms of sterling changed but little from their pre-September values, and consequently the effect on trade was negligible. Imports from these countries would appear to have received little, if any, check. The coal export trade seems to be benefitting to a certain extent. The export of coal to Hamburg and Antwerp has increased. Poland is finding it more difficult to compete with the Area since her f.o.b. charges have become practically the same as our own. But we have been unable to reap the full advantage of this change in the position since most of the Scandinavian contracts for Polish coal do not expire until the end of the year; and in the meantime Scandinavian buyers are waiting to see what further change is likely to take place. Probably the most important change lies in the fact that a number of cargoes of coke are now being sent to the U.S.A.; some for the steel works there, and some for domestic heating. The kind of coke the Area is able to supply appears to be exactly the kind required in the States, and we are informed that a considerable volume of orders has been booked for 1932.

The change from the gold standard has also quite definitely helped the coal-bunkering trade. It has brought about a considerable diversion of bunkering from Continental ports to the ports of the North East Coast, prices now being cheaper here than at Rotterdam or the Hook of Holland. Further, a considerable number of cargoes of Durham bunker coal—often as much as 7,000 tons at a time—are being sent out to bunkering stations in the West Indies, which were formerly supplied from the U.S.A.

The coal trade with France shows but little change. We are, however, maintaining the exports allowed us under the French quota system. Shipments of coal to Spain were suspended during the Revolution but are now being resumed. It is anticipated that the coal and coke trade with Canada—hitherto small—will increase in the near future. The freights to Canadian ports from this country are low, since they help the homeward cargoes.

It is probable that the full effects on the coal and coke trade of the North East Coast have not yet been felt. Foreign buyers are possibly holding their hand in the hope that this country will abandon its policy of minimum prices.

In the iron and steel industry it is probable that the change from the gold standard has afforded a certain measure of assistance to manufacturers in the home market, and it is also probable that British makers have had a better chance of competing in certain foreign markets. But the tariff policies of other countries have effectively prevented any increase of our export of iron and steel to them.

The expectation of an increased export trade was fairly strong in the engineering industry, especially in electrical engineering; but, judging from the replies to specific enquiries on our part of some thirty firms, these seem to indicate that there has been but little change during the last three months; and that practically no orders have been received which could be directly attributed to our going off the gold standard. In certain branches of the engineering industry there are special reasons for this. Thus China and the South American Republics have been among our chief customers for locomotives in the past. But these markets have become unsettled through internal troubles in these countries, and this has been sufficient to offset any advantage we might otherwise have obtained by the depreciation in the value of the pound.

In ship-repairing and possibly in shipbuilding, some little improvement is noticeable during the last few months. One of the biggest firms of ship-repairers on the North East Coast has had a certain increase of work recently which it thinks is probably due to the fall in the value of the pound, but the amount so traceable is certainly not large; and probably the same is the case with shipbuilding.

A slight increase in activity is also observable in the case of the shipping industry, but here again it is difficult to measure the increase or to assert that it is due to any one cause. There has been some increase of activity among tramp steamers in cases where freights are payable in foreign currencies, as, for example, in the case of the United States and France; though the gains are partially offset by the increased cost of foreign port dues, owing to the depreciation of the pound.

In certain cases in the Distributive Trades we have found that orders for foreign goods have been cancelled; and this

should therefore increase the demand for goods of British manufacture. Certain retailers, such as drapers, are complaining that the effect of going off the gold standard has been to deprive them of certain lines of goods in active demand, which either cannot be met by British manufacturers or only at a price above that which customers will pay. Such retailers therefore anticipate a diminished turnover as a result of the change.

We are thus compelled to conclude that the benefits which were anticipated by business men in consequence of our going off the gold standard have been realised only to a very limited extent in the North East Coast Area; and that it is impossible from the information before us to measure what the extent of those benefits has really been.

(xvii) **The Prospects of the North East Coast Area.**

The industrial position of the North East Coast has been built up on the four basic industries of coal mining, iron and steel production, shipbuilding and ship-repairing, and marine and general engineering, chiefly of the heavy kind. Her prosperity in the past has depended on these industries, and unfortunately these four industries are among those most severely hit by the post-war depression.

Recent investigation has shown quite clearly that the output capacity both of the coal mines and of the shipyards not alone of this Area, but of the country as a whole, is in excess of present, and as far as can be seen, of future demand, either in home or foreign markets. The problem, therefore, in both these industries is how best to eliminate redundant capacity. The same problem, though possibly to a less degree, confronts the iron and steel trades and the engineering industry.

It is unnecessary here to consider the causes which have led to the present position of these industries. The main facts are already well known. Producers in this country have been handicapped partly because their costs of production have remained high, but chiefly because other countries for both economic and political reasons have been determined to develop their own basic industries. In order to succeed they have been forced in many cases to protect these industries either by the imposition of tariffs or by the grant of liberal subsidies. But though their growth has been an artificial one, and not a natural one, the broad fact remains that not only in this country but in the world productive capacity has outrun demand. This situation shows no sign of changing in the near future, and we have therefore to face the prospect that Great Britain's share in the production of these basic commodities has definitely and permanently diminished. Thus in common with the export industries of the country the industries of the North East Coast have been

handicapped by the growth of nationalistic tendencies abroad. Tyneside has been specially hit by the greatly reduced demand for warships and armaments.

The problem facing the basic industries of the North East Coast is, therefore, one of scaling-down to meet a diminished demand which is likely to be permanent rather than one of expansion. We see no possibility of evading this issue. In this process of scaling down, however, we can see no reason why the North East Coast should not maintain its pre-war proportion of the total output of the whole country. Alike in coal mining, in shipbuilding, in the production of iron and steel, and in engineering we are of opinion that with enterprise the Area can maintain that proportion. On the other hand we see but little likelihood of that proportion being increased; though naturally this will depend on the degree of inventiveness shown by the industrial leaders in the Area. Unless this quality is shown in a higher degree than elsewhere, the most that the Area can hope for is to maintain its pre-war proportion of the total British output. In this respect the North East Coast differs in no material way from other centres where these are the staple industries.

We come now to the other industries of the Area. One marked feature of the North East Coast is its comparative dearth of subsidiary industries. In number and variety it contrasts somewhat strikingly with other great centres of industry. Compared with the four basic industries the amount of employment afforded by them is small, with the possible exception of the chemical industry. The glass and pottery industries which are ancient trades on Tyneside, are now of relatively minor importance in the Area. Apart from such general industries as the catering trades and transport, the chief ones in the Area after the chemical industry are shipping, the clothing trades, sawmilling, furniture-making and general woodwork, the printing trades and the confectionery trades.

In none of these, except perhaps in the chemical industry on Tees-side, do we find any grounds for thinking that they will develop to any considerable extent. A certain amount of expansion in some of the minor industries of the Area has taken place in recent years. This expansion was to be expected. The proportions of the workers engaged in these industries in the Area are less than the proportions in the country as a whole; we think it likely that they will continue to expand. But this expansion will be quite insufficient to compensate for the diminution of activity in the basic industries. Nor can we foresee any expansion of the local shipping industry unless the import and export trade of the North East ports, on which it chiefly depends, increases.

The evidence reviewed in the memoranda attached to this Report suggests in short that in the future the Area is likely to play a less important part in the national economy than it has done in the past. If this be so, it will have to look forward to the establishment of a new post-war equilibrium at

a lower level of activity than that which it established in the days prior to the War. In fact there are signs that the North East Coast Area has already moved some way towards this new position of equilibrium. But the movement is, as yet, not complete, and it will entail the continued migration of workers to other centres of industry.

We estimate that as things are at present there is a labour surplus in the Area of about 64,000 male workers. It is, of course, possible that some of this labour may be so specialised as to be unsuited for other kinds of work, especially those kinds which call for familiarity with lighter mechanical processes. But in the main this is hardly likely to be the case. The majority of the workers should be sufficiently adaptable to undertake other kinds of employment.

It does not follow because the main industries are reduced in size that the productive efficiency of the Area will be less in the future than it has been in the past. It is probable that with smaller but more compactly organised industries productivity will increase, and there are indications that this has, in fact, been happening in the last few years.

The changes in the industrial character and importance of the North East Coast, which we have outlined may, of course, be modified if new industries can be attracted to, or developed within, the Area. Some progress in this direction has already been made. There have been, as the memoranda show, developments in the glass bottle industry, in the ready-made clothing trade, in the making of laminated and other springs, of rustless steel, and of leather goods, in the extraction of copper, and in the production of certain fine chemicals. But these developments are small, and though it is true that the staple industries of to-day had small beginnings, we find it difficult to believe that these new industries will increase to such an extent as to absorb the labour no longer required in the basic industries. One may not overlook the fact that the Area has failed to attract the newer industries which have developed on a large scale in other parts of the country, such as the motor-car industry, or the industries dependent on the progress of wireless broadcasting.

At first sight it is difficult to explain this failure to attract these new industries. The Area has certain features in its favour. It is fairly compact and has a population of some two and a half millions, giving it a large home market. Its communications by road, rail and sea are at least as good as those of any other industrial area in Great Britain. It has land suitable for workshops and factories, with ready access to the sea or to railway lines or to both. Shipping facilities both for imports and exports are good, with regular sailings to all parts of the world. Coal and other raw materials are available. The labour supply is ample and efficient. Why then has the Area not shared in the industrial developments of the post-war period? The question is not easy to answer.

We are inclined to the view that it is because the North East Coast suffers from certain disadvantages as a distributing centre for the products of these new industries. It is somewhat remote from the other centres of population. The West Riding of Yorkshire is some eighty miles away, the industrial region of Scotland double that distance. Though communications are good these distances tend to make transport charges, whether by road or rail, prohibitive. Unless therefore a new industry can take advantage of the facilities for sea-transport, either for its raw materials or its finished products, it can establish itself more economically elsewhere. This makes us doubt whether efforts to attract new large-scale industries to the Area will achieve any marked degree of success.

In our opinion such development as is possible is more likely to be brought about not so much by the attraction of firms bringing in industries new to the Area as by the adaptation of existing works to meet new needs and new conditions. Such a transition from one kind of industrial activity to another under the stress of economic forces would be no new phase in the industrial history of this country. Other districts have had to effect a transition of this kind in the past; the North East Coast is faced with the necessity of doing so now. The transition will not be an easy one. It is not easy for an armament firm to adapt itself to peace conditions in which the demand for armaments is negligible. But certain armament firms are not without hope that the change can be made, and that in the making of locomotives, or other things, they may find new openings. It is along such lines as these that we look for the chief developments in the Area in the near future.

The industrial future of the North East Coast, as of other depressed areas, depends, therefore, in the main on its own business leaders. In the past they have found all the openings that they needed for their energy and their capital in coal, iron, ships, and engineering. Profitable though this has been found their range of product, except in shipbuilding and certain branches of engineering, has been narrow. Present needs demand a wider range, sometimes, as in coal, involving a more complex exploitation of natural resources, and sometimes, as in engineering, involving an adaptation of existing plant to the production of new commodities. Such changes mean that in the future they must, wherever possible, call in science to their assistance. That there are opportunities for such changes even if limited ones, is evident. In the past colliery owners have been content to market their raw product, coal, leaving it to others to turn it into coal-gas, coke and chemicals. This mistake is now to some extent being rectified. Within recent years new industries dependent on a scientific utilisation of coal have developed and in this the Area has played a part. There are possibilities in the newer methods of winning and marketing coal. The Area can at present supply its own coal-screening plant but not its own coal-getting machinery. There are thus, we think, a

number of industries subsidiary to the main industries which might with advantage be established in the Area. At the same time, however, the business leaders of the Area must look for opportunities in other fields. The mineral and other natural resources of the Area have not been exhausted. The North East is rich in road-making material, in building-stone, and in certain refractory material suitable for modern furnace work. There appears no reason why these and other resources of the Area should not be more fully exploited.

In agriculture also, there are possibilities of development. The Area imports large quantities of butter, eggs and bacon, though a large proportion of these is sent to centres outside the Area. These imports will therefore probably remain large. But the Area is capable of supplying more of these things for itself. It does not lack the ability to do so. What is lacking is the will to provide the organisation required for their collection from the farms and their distribution to consumers. In agriculture, as in industry, what is needed is the willingness and ability to appreciate new ideas, to adopt new methods, and to try out new enterprises.

MEMORANDA.

I.—THE GENERAL CHARACTERISTICS OF THE NORTH EAST COAST AREA.

(*Memorandum by Mr. G. H. J. Daysh.*)

In the immediate succeeding pages the attempt is made to portray generally the major characteristics of the North East region as a whole and to indicate briefly the sum total of the natural advantages for the various forms of economic activity engaged upon.

This North East Area forms one of the most clearly defined geographic areas of the country. Its seaward rim consists of a 100 miles stretch of coast between the high cliffs of the North Yorkshire Moors and the limited stretch of plain overlooked by the igneous dome of the Cheviots south of the Tweed. Its inland boundaries are concisely fixed by physical barriers. These are three-fold—to the south, the line of the North York Moors, to the west, the Northern Pennines, to the north west and north, the Cheviot region. While representing high and often inaccessible country, these areas also present a wide belt of sparse population, isolating the denser population in the centre of this area of high country from neighbouring realms. Fortunately, there are significant breaks in both the rim of high land surrounding the central industrial zone and the long stretch of often inhospitable coast—inhabitable in the sense of limiting the contact of modern shipping with it.

The divisions between the independent sections of the physical surround of the North East have been all important in the development of the Region. There are three gateways thus provided. To the south is the Northallerton gap, a low plain, below 200 feet with a width of some 10 miles, isolating the Pennine country from the North York Moors. Through this gap naturally provided movement has always been easy and communications have been readily established, linking the predominantly industrial North East territory, through the agricultural region of the Vale of York, to the Midlands and the South. The concentration of routes upon this gap is obvious and striking. There is no alternative economic highway by land from north to south along the east coast other than by this gap. From it to the west diverges a route, following the natural highway of Wensleydale to the west coast.

The major westerly route is that established through the Tyne Gap. The railway follows the Tyne valley to Hexham, thence the South Tyne valley to the Irthing and so on to the Plain of Carlisle. The gap is narrow, in places less than a mile wide, and road, rail, and river closely approximate. No great height has to be reached to cross through the Pennines, the maximum elevation being only about 470 feet. The natural conditions therefore are such as to eliminate any steep gradients. In the lower section of the Tyne

valley the communications are important as links to colliery workings that stretch up the valley to the westward limit of the coal-field. While there are sites above Prudhoe that are developing as dormitories for a section of the Tyneside population, the routes are most important as through routes connecting East and West.

The northern gate is that between the eastern end of the Cheviot and the sea. It is a long and narrow passage, a plain area interrupted by a series of low hills. An unproductive zone, the routes are predominantly through routes and have little local significance. A gateway of historical importance, it continues important as the natural economic link along the east coast.

A considerable percentage of the high country between these natural gaps rises above the 1,000 feet contour, that is the cultivable level for this region. Few through crossings have been made across any one of these sections. In the North York Moors section a series of commercial highways have been driven into the northern flanks of the Area—under the stimulus of ore content. These routes are short and the movement of ore from the area to the Tees valley was easy and cheap. The gradient from the outcrop to the river helped, coal and limestone were at hand and the early development of pig iron production on Tees-side was largely due to these facts. Prior to the construction of these routes following upon the location of the ore band, ore had been imported from the cliff coast of the Cleveland and North York Moors and a number of small centres had grown up. But the ore was inferior in quality, more difficult of obtaining, most costly to transport, and, when large scale workings developed on Tees-side using the better quality ores of the seam on the north side of this Cleveland country these centres lost any direct industrial significance. The present coastal route links a number of holiday resorts, established where sheltered conditions and a sandy beach are natural advantages, e.g., Whitby, a former ore centre, and Saltburn.

Between the Northallerton Gate and the Tyne Gap, crossings from the central zone over the Pennines are few. Their position and direction are governed by natural conditions. From Darlington, the market centre of pre-industrial days, now a combination of this aspect and an engineering centre, a route runs north-west into Weardale. The railway terminates at Wear Head but the road continues on across the watershed, rising to some 2,000 feet, to Alston and the west coast. This Weardale region supplies a considerable proportion of the limestone required in the steel industry of Tees-side for fluxing purposes. The carboniferous limestone, together with the almost pure limestone located in the magnesium limestone cover of the eastern half of the coal field and worked extensively near Darlington and Sunderland, forms the main supply of the whole of the North East region. Other than for the limestone workings, the mainly disused lead workings, the road material and building stone quarries, the predominant occupations are pastoral in character and the Weardale route serves

but a sparse and widely dispersed population. South of this route a similar area is served by communication running due west from Darlington via Barnard Castle up the Greta valley to Kirkby Stephen. A branch line runs north west from Barnard Castle to Middleton in Teesdale where it terminates, the accompanying road passing on across Alston Moor to join the main Weardale route at Alston itself.

Between the narrow but effective Tyne Gap and the main East Coast, four routes must be mentioned. Firstly, there is the road route following the line of the Roman Wall. It passes along a ridge overlooking the Tyne valley from the north, a beautiful but lonely stretch of country with two points where steep gradients occur. It is less used by road transport than the valley route. Secondly, there is the combined railway and road route established north west from Hexham by the North Tyne to Riccarton, through typical moorland and dale territories. Thirdly, there is the road route from Newcastle via Otterburn to Jedburgh, again a beautiful but lonely passage, and lastly, the rail and road route from Newcastle via Wooler to Cornhill and the Tweed Valley, skirting the eastern end of the main body of the Cheviots. None of these routes has the degree of economic importance that the Tyne Gap and east coast routes proper possess. They must be considered however as units in the general economic structure of the realm.

Coastal links.—The coast as a whole lies in an almost straight line from NNW-SSE. It is in general a rocky coast but with a noticeable regularity in outline. This is due to glacial deposition and coastal erosion. Many irregularities have been eliminated by the formation of sand bars across the mouths of small inlets, the lagoon so formed being later filled by silt and sand. Small islands have been linked to the coast itself by "tombolos". The most important of these is that on which Hartlepool is now situated. A bar of sand linked the island to the mainland. The north side link is complete but the south side has naturally provided the essential harbour accommodation which would otherwise not be available. The physical character of the coast is such as not generally to provide particularly natural harbour sites for shipping. Each of the three great estuary breakages in the coast, the Tyne, Wear and Tees, has had to be artificially improved to render it accessible and allow of trade contacts. Improvements are still essential in many instances to eliminate time wastage and increased costs.

The factor of accessibility is most vital where the coal measures approximate to the coast. North of Alnmouth, coastal development is only for fishing, decay in the fishing villages being compensated now somewhat by their development as holiday resorts, e.g. Seahouses, Beadnell, Bamburgh. The variety of the coast enhances their attractions. From Alnmouth to South Shields the surface coalfield reaches the coast and in this section there have grown up a number of important coastal ports. The Tyne ports dwarf the

smaller centres of Blyth and Amble but in each case it is important to remember that developments have only been possible by the artificial improvement of these harbours.

From South Shields to Hartlepool the coast is largely formed by the low cliffs (up to 100 feet) of the Magnesian Limestone overlying the "concealed" coalfield of East Durham. The beach is frequently rocky but sandy stretches occur. Access to this coastal section has been vital, the major ports being Sunderland at the Wearmouth, Seaham Harbour and the Hartlepoons—the last having the best natural facilities.

South of Hartlepool, outside the known coal measure region, the coast is lower, due to the more easy and rapid erosion of the marls and clays of the Tees valley. This is the only considerable section of low lying coast with a relative abundance in the vicinity, particularly of the Tees itself, of poorish level land providing actual and possible factory sites. Reclamation has been essential in this region of sand bars and mud flats and is still continuing. Again, the Tees waterway has had to be improved to allow access from the sea to the blast-furnaces and factories established inland.

The preliminary matter so far presented here has shown something of the general character of the North East region, its extent and the manner in which its outward and inward communications are naturally controlled and effected.

A more complete appreciation of both its physical and human aspects may be realised by a division of the whole region very briefly into contrasting realms. In the first instance it is clear that there are four major differing zones, (a) the moorlands and dales formed mainly in the Lower Carboniferous rocks, constituting by far the greater area of the whole region but having only a small percentage of the population, (b) the Coal measure region, included within the triangle of territory as follows—the Coquet mouth to Hartlepool, Hartlepool to Woodland in S.W. Durham, thence generally N.N.E. to the Coquet mouth, (c) the Tees valley, the most important agricultural region of the North East, industrialised in its coastal section, (d) the Cleveland hill country.

It is the coalfield area which dominates the life of the North East. The moorland and dale country is naturally, through lack of mineral wealth and limitation of agricultural possibilities, a thinly peopled territory. Indications of the effect of the industrialised region on it are not wanting and it now is a part of the economic whole. Its limestone section provides flux; its sandstone, roads and building materials, grindstones and such like. Its agricultural community—though having experienced considerable rural migration—plays a small part in the food supply of the industrial population—small because even under most encouraging circumstances, soils, climate and relief limit the extent and character of land utilisation. This is not to suggest, however, that the agricultural and pastoral areas are necessarily now producing their maximum food supplies. The river systems and lakes form the water supply

also of the industrial community—e.g. the reservoirs of the Tyne and Wear valleys. The dales represented the lines of least resistance for communications to follow in forming the necessary land routes. Timber of this area was originally used but now has little significance.

The Tees valley agricultural region is similarly affected and constitutes a part of the whole. Where agriculture predominates dairy farming is its most prosperous branch. The ancient market towns of Stockton and Darlington are industrialized. The low plains are natural highways for routes. The whole region is dominated by the nearby industrial activities.

The hill country of Cleveland forms both the southern physical limit as well as being an economic unit. Its higher areas above 1,000 feet are open moorland. Its dales have most fertile soil and a better climate than those of the Pennines and Cheviots. Its ore resources have been mentioned. The more accessible and better grade ores have been exhausted. With increasing distance from the Tees the seams become thinner and more expensive to work. The iron content of the stone now being mined is below 30 per cent. But this ore provided the stimulus to the present steel industry of Tees-side, though now in quality and quantity it is lacking—providing less than one-eighth of the ore used in the Tees area. Seven-eighths of the ore has now to be imported. The former isolation of the Cleveland zone has been changed, its rural population added to by the mining population and a number of mining towns and villages have sprung up.

The industrial geography of the coalfield area is of great importance. Whilst only occupying about a quarter of the total land area we have seen that it contains some four-fifths of the total population. In a general way this population is a coastal population and it can readily be seen why so frequently the region is termed the North East Coast Area. The coalfield is really in two sections, the surface coalfield and the concealed. The latter is the south east section where Permian rocks cover the coal measures. The westward limit of these Permian deposits is indicated by a line drawn from the coast just south of the Tyne to Westerton Hill, east of the bend of the Wear at Bishop Auckland.

The maximum distance of colliery workings to the coast with its all important breaks and harbour sites, is only about 30 miles, which may be compared for example with the Yorkshire coalfield areas. Costs of transport are therefore reduced. It has been estimated that the average distance from pit to port is only 10 miles. The first worked areas were to the west, in the higher country. Movement of coal was easy due to the gradient factor. While relief prohibited canal construction and the rivers are not natural waterways, conditions were not completely adverse. The steam engine, introduced in this area primarily as a pumping machine, was developed into a locomotive for hauling purposes. Early railway development, the Darlington-Stockton route, was

laid down to allow movement of coal from S.W. Durham to Tees-mouth. Its later continuation to Middlesbrough gave that site its great opportunity for the rapid development that subsequently took place. The surface coalfield of Northumberland and Durham has been the longest worked. Now the concealed coalfield is being thoroughly attacked. Borings are deeper—over 500 feet—but these deeper mines are closer to the sea coast and therefore depth of work is somewhat counterbalanced by shorter surface transport. There is, however, a considerable difference between the two sections of the coalfield—the surface areas with many sections exhausted and more widespread workings—the concealed with its more concentrated borings and consequent effect upon population distribution in the sense of closer groupings at particular points.

The seams have not been unduly disturbed by faulting and occur in workable widths varying from 18 inches to nearly 6 feet. There is considerable variation in quality, all types save anthracite being represented. Durham coal is particularly free from sulphur and phosphorus, e.g. the Brockwell seam of S.W. Durham, and coke from this coal is much in demand on Tees-side, Furness and West Cumberland for the haematite blast-furnaces. The majority of the coking ovens are of the by-product type, and this has its significance in connection with the chemical industry. Stacks of beehive furnaces remain—not necessarily indicative of lack of progress. Gas, tar, ammonium sulphate, ammonia liquor, benzol and naphthalene are all by-products of considerable marketable value. Where the coking processes are carried on beside the iron and steel plants the use of some of these products, particularly tar and coal gas, which formerly were wasted, has reduced the consumption of both coal and coke and thereby lowered the costs of producing iron and steel. This has particularly happened in the Tees-side region.

The coalfield has been worked continuously since the 12th century. "Sea-cole" was an export from Tynemouth to London in 1269. While no doubt the coalfield is relatively nearer exhaustion than the general average of British coalfields this is by no means yet a significant factor. The reserves have been estimated at about 7,700,000,000 tons, which means a minimum life of approximately 140 to 150 years at the present rate of normal consumption.

Within the area of the coalfield, industries based upon the coal supply have developed. While in recent years a more distinct grouping of the iron and steel centres has occurred, originally small centres were widespread inland. Their situation in the first instance, as with the Consett Iron Works of N.W. Durham, appears to have been governed by the local ore resources in the form of the "black-band" iron ores of the coal measures. While for some time that formed the major supply it was soon exhausted when demands became emphatic. But some of the inland centres survive since really they are little distant from the sea. Such a centre as that at Consett illustrates the close relationship of coal mining and associated industries in the coalfield zone where modern mining

methods have been evolved. The Iron Works owns its own collieries, makes coke-nuts, sulphate of ammonia, crude benzol, solvent naphtha, tars, pitch and creosote, has its own furnaces and makes different grades of pig iron, has open hearth steel furnaces and steel rolling mills, produces silica and fireclay bricks and shapes. As a general rule, however, blast-furnaces are mostly concentrated in the south east of the region—the Middlesbrough-Tees-side region. They are not, for example, a feature of activities on Tyneside which absorbs a percentage of their produce in its various iron and steel works, primarily associated with shipbuilding aspects. The ore is not present in this section and blast-furnaces were never established in any number in this portion of the coalfield.

The iron and steel goods produced by the North East concerns show considerable variety. Plant for gas companies, coke ovens and blast-furnaces; marine engines and boilers; steel castings for bridges and buildings; locomotives; turbines; freezing plant; cables, wire ropes, pumps, locomotive wagons and so on. There is close connection with the shipbuilding industry and Tyneside particularly shows this overwhelming specialization. The degree to which the industries are interwoven and intimately associated may be finally indicated by a brief analysis of the major coastal sites. Their importance in one general sense may be understood by the fact that of the ten towns in the Area whose population exceeds 50,000, only one, Darlington, is not a sea-port. Three-quarters of the total population are clustered along the estuaries and the coastal lands between them.

The Tees-side Industrial Region.

The above term may be taken as applying to the industrial area immediately concerned with the Tees valley and extending north to the Hartlepoons. For the agricultural population of past days it is apparent that the plain areas were somewhat repellent. Settlements were established along the drier edges of the bordering escarpment to the south in particular, but now the poor land around the Tees outlet has become the region of maximum concentration. It is not our purpose to trace the historical development of this zone, but it may be of interest to indicate the rapidity of growth over a century by the fact that whereas in 1831 the population of Middlesbrough was given as 154, its present population is over 138,000. The factors which are vital of consideration as explaining the general industrial significance of this particular iron and steel region of the North East may be grouped as follows :—

- (1) Nearness to abundant supplies of good Durham coking coal. Cost of assembling is low, owing to this short transport. The peculiar quality of the coal has been mentioned. By-product ovens have been established on Tees-side and the use of by-products has reduced costs of production as well as

being of advantage in connection with the chemical industries established at Billingham. Where the grouping of by-product ovens, blast furnaces, steel smelters and rolling mills has occurred, the utilisation of by-products attains its maximum. Blast-furnace gases, for example, are employed to heat the blast, to convert iron and steel, to maintain heat in soaking pits, to operate rolling and plate mills and to produce power generally.

(2) Local supply of Cleveland iron ore—limited in quantity and quality as has been stated, but yet being a factor still despite the considerable import of ore from Spain, Algeria, Norway and Sweden. The high phosphorus content of the Cleveland iron stone means a yield of highly phosphatic slag. When ground fine, this forms a fertiliser. Slag is also used extensively for bricks and forms the basis of an important industry for the production of tar macadam and other road making material, of cement and of concrete.

(3) Nearness of limestone suitable for flux—both in the Wear valley and the magnesian limestone worked extensively near Darlington.

(4) The waterway of the Tees itself giving inland penetration of shipping. The entrance was originally blocked by a bar with a depth of water over it of only some $3\frac{1}{2}$ feet at low tide. The waterway, now under the control of the Tees Conservancy Commissioners, has been dredged to a depth of 37 feet at high tide at the entrance. Deep water berths are now available with 20-25 feet of water at low tide. The river has been confined and shoaling reduced. Breakwaters give protection at the entrance—approach was originally particularly dangerous with a N.E. wind. Access to the river is now possible, wharves and docks having been constructed. Further dock construction would appear essential since delays and congestion occur in the handling of the major imports of ore and timber. This applies also to Hartlepool. It may be added here that Hartlepool, while primarily a coal export port and an importer of timber and ore, is the second most important fishing port of the North East coastal region.

(5) Available low lying land for factories, blast furnaces, etc., and for easy railway and road construction. Land reclamation has taken place and is being continued, waste products being used for filling low regions. Ample space is provided—the big essential for industrial concerns which are of necessity widely spread and yet must have direct access to the waterway. Most of this development has naturally taken place along the southern shore. Shipbuilding yards have been formed and the shipbuilding industry is without doubt the most important single

user of Cleveland products. Marine engineering, boiler making, etc., have been automatically developed in association with the shipbuilding trade. Middlesbrough has long been a shipbuilding centre. Construction of oil tankers, whalers, tugs and cargo boats has taken place and there are repair centres. Railways constitute a large home market—a speciality being the manufacture of high conductivity steel rails for use on electrically operated systems. Structural steel and mining equipment are further important features.

(6) Advantages for the chemical industry as established at Billingham. Local deposits of salt, anhydrite, gypsum, and sulphur are at hand. Coal is cheap, there is an ample water supply and land for development is available. Thus has this site developed enormously under the Imperial Chemical Industries Limited in the last few years. A definite concentration in this really unique situation, unique from the point of view of natural advantages, has taken place and a considerable population growth within the area has resulted, e.g., an increase of over 9,000 in ten years in the Billingham district.

(7) Advantages provided by effective internal railway and road communications—giving the region a much more extensive hinterland than simply its local natural area. The question of railway rates affects naturally the actual economic extent of this region to the interior.

(8) Transport facilities provided by coastal shipping and therefore effective and cheap water transport. This factor is important to the Area as a whole as a local transport element as well as providing external links to more distant regions.

(9) An efficient local labour supply—as represented by the urban agglomeration in Middlesbrough, the Hartlepoons, Stockton, Thornaby, Grangetown, South Bank, and Redcar.

It is clear that Tees-side has many natural advantages and that these have already been considerably utilised. Its total population of some 368,000 means that there must be a distributing centre within the district and road and rail facilities exist. At least eight shipping companies provide an external contact with North and South America, India, Australia, New Zealand, China, Japan, South and East Africa, the Mediterranean, and North European zones. Space, power, light, heat, water and raw materials are available.

Further development would seem an economic feasibility on these grounds. The increased exploitation of this waterway, the provision of additional shipping facilities, the continuation of reclamation and the extension of the natural hinterland are essential. The opportunity is provided and it remains for this zone, free from complications of long established industries and built up

areas, with a minimum of adverse local geographical disadvantages, to be used to its maximum as a very definite industrial region of the North East coast.

The Wearmouth Region.

The Wearmouth activities are centred in Sunderland—itself a distance of 15 miles from Newcastle. The Wear estuary is naturally a rocky channel and the making of a large deep water harbour has not been practicable. Effective penetration by sea-going vessels is restricted to under 2 miles but there is a depth of 25 feet L.W.O.S.T. and 39 feet 6 inches at high water at the entrance. The facilities for the deep sea vessels and coasting bulk cargoes are described as fully adequate, considerable improvements having been made. This port forms the outlet for coal, coke, machinery, rails, etc., being largely an importing centre of timber with some iron ore, pig iron and oil. Shipbuilding yards and engineering works are established. Its economic life is closely bound up with that of Tyneside and the latter reduces its natural hinterland and by so doing, the extent of Sunderland's internal industrialism. Its hinterland is reduced by the fact that the continuation of the valley of the Middle Wear northward by the Team valley to the Tyne leads to the movement of coal and other trade direct to the Tyneside area from West and Central Durham, leaving Sunderland with a restricted but active small section within its own local environment. Including the immediate suburbs the population of Sunderland amounts to over 185,000.

The Tyneside Region.

This area represents the present major grouping of population within the North East coast territory. The Tyne valley is the most significant estuary penetration within the coalfield itself and is approximately centrally placed. For over fourteen miles the navigable lower Tyne is the axis of a close cluster of industrial towns with a total population of nearly 900,000. Over this distance the waterway is under the control of the Tyne Improvement Commission. Considerable changes in the bed of the river have had to be effected to render it the economic highway that it now represents. Originally the river was able to be forded near Newcastle itself and navigation was only by very small craft. Shallowness, sand bars, flooding, a twisting course and a dangerous entrance all have been overcome and the channel is essentially a man-made navigable route. Widening, deepening, and straightening have all been carried out and the entrance dredged and protected by piers. Silting has constantly to be allowed for and about a million tons of silt are removed annually. Further deepening is reported to be possible but in the upper section particularly, widening is naturally and emphatically restricted. From the sea to opposite Northumberland Dock there is a depth of 30 feet at L.W.O.S.T. and from this

point to the Derwent entrance from the south there is a depth of 25 feet L.W.O.S.T.

The valley is markedly U-shaped over the greater part. There is a flat floor varying in width from half a mile to some two miles, enclosed by steep banks rising from 50 ft. to 150 ft. above the river. This limits low ground immediately near the river, and forms a strong contrast with the spaciousness of the Tees river borders. It is only in the lowest portion, near to the sea, that greater extent of level land is found and this is the section where the major wet docks are located. In the upper two-thirds, accommodation is in the form of riverside quays.

Newcastle, the focus of this industrial agglomeration, lies on the north bank some 10 miles from the sea. On the opposite high bank lies Gateshead. Newcastle is a natural strategic site. At this point the valley is considerably constricted by the high north and south borders (374 ft. from quay to quay). The ford crossing was immediately east of this point. The Team valley to the south provided the main natural highway to the Middle Wear valley and so to the South. Here also the major N.-S. route met the transverse route across North England by the Tyne Gap. Later, bridging was found to be relatively easy in this section—more easy than either below or above. The more recent of the bridges cross the river at the level of the restricting bluffs, eliminating a steep descent to the river edge and therefore the possibility of affecting river transport. The new Tyne bridge gives a clear headway of some 84 ft., but Scotswood Bridge has a clearance of only 18 ft. at H.W.O.S.T. The Swing Bridge has a central section requiring movement as it allows a headway of only 14 ft. at H.W.O.S.T.

The physical character of the valley has determined the nature of its use to a considerable degree. While the high banks were an asset in the construction of staiths, since the gradient was naturally provided and the level could still be maintained above the river itself, the limited low level ground near the river has prevented industrial expansion away from the river. Also access to the river sites is normally by very steep banks. Thus is found an elongation of shipyards, factories, staiths, docks, quays and wharves from W.-E. on opposite banks beside the river. These aspects of the industrialism are largely hemmed in by residential areas and business premises, etc. This characteristic type of grouping only changes above the bridges, where the extent of the navigable highway is short, and in the very lowest section. Even here there is little spaciousness to compare with the type of land occupied, for example, by the new Ford works at Dagenham, and by many of the large iron and steel concerns on Tees-side. The expansion of the waterway has been most emphatic in this lowest section and tidal basins have been made. On the north side are the Northumberland and Albert Edward Docks, controlled by the Tyne Improvement Commission. On the south side is the Tyne Dock

belonging to the L.N.E.R. Jarrow Slake borders the latter dock. It has long been a dumping ground for sand ballast. Part of it is used as a timber pond. It is proposed to construct there another tidal basin, a proposal forthcoming from the Tyne Improvement Commission and requiring the active co-operation of the L.N.E.R. Suggested improvements of this kind and in the extension of riverside quays higher up the river are not lacking. They appear essential. An increased concentration upon the lowest section of this industrial zone would seem most practicable and economic. There is greater space, less physical interference, greater possibilities of increasing navigable accommodation, a saving of time by eliminating the slow journey up the river to higher points. Existing rail and road facilities could be added to, while the necessary river crossing has already been a subject of discussion. At the moment cross contact is established by ferries. North to south road and rail movement is confined to the Newcastle area. Proposals actually for two river crossings below Newcastle have recently been brought forward. Even in this wider zone, however, new housing estates have been started and the same quality of "rim" concentration on the river is being enforced. Certain areas do remain, for example, immediately south of the Jarrow Slake section, where considerable railway contacts already exist. Sites on both north and south sides have been allocated for potential industrial activities, others are a matter of discussion, but the whole matter is complicated by the built up character of much of this land. In the narrower section of the river, obsolete shipbuilding yards present certain possibilities for alternative industrialism but their extent is definitely affected by the physical control and on these grounds alone their value is somewhat negated.

The trade of the Tyneside region has developed predominantly upon the basis of the coal export and shipbuilding activities. The part of the coalfield in the immediate vicinity of the Tyne was the first worked and coal exporting points were established all along the river from Newburn to the sea. Before deepening began coal was taken down the river in keels to be loaded into larger coal vessels. Later on with the river becoming more navigable to the larger vessels, it was found easy to construct staiths and so perform direct and economical loading into the ocean-going ships. On land the movement of the coal was firstly by pack horse, secondly by wooden rails and then by cast-iron rails and flanged wheel trucks. The topography, as previously stated, generally favoured the use of self-acting inclines. Northumberland steam coal came from the north side of the river, Durham bituminous from the south. Originally the whole coalfield might have been taken as the natural hinterland of Tyneside but the southern section output was deflected to the Tees and Hartlepool region after the railway construction in that area. It is significant that the southern area was later developed, particularly the concealed

coalfield, following upon improved mining methods and the ability to counteract, for example, water-bearing strata. In other words the Tyne taps the longest used section of the coalfield and has little opportunity of forming a major outlet for the southern section. The chief centres for coal shipment are at the Northumberland Dock, Tyne Dock, Albert Edward Dock and the Dunston Staiths. The Staiths belong to the L.N.E.R., the Tyne Improvement Commission and to various private concerns. These points of coal export are also timber importing, the natural return freight, mainly from the Baltic.

Shipbuilding on the river originally took the form of small wooden vessels mainly required for the coal trade. Iron ships were built as early as the forties but the building of the first screw collier, "John Bowes" in 1852, marked the real establishment of the Tyne as a centre for iron ships. The transition from iron to steel in the seventies and eighties was comparatively easy, because the area is so near the large steel concerns of Durham and N.E. Yorkshire. The area is now equipped for the building of all types of vessels from large liners and warships down to colliers and tugs. Whaling vessels and oil tankers have been something of a speciality in recent years. There is a total of 15 shipbuilding yards along the Tyne, seven on the north side, eight on the south. The slips vary from approximately 1,000 feet long and 140 feet wide down to 100 feet long and 30 feet wide. At some of the slipways work has latterly been completely suspended. The floating dock at Southampton, the Mauretania and H.M.S. Nelson are modern achievements of this great centre of shipbuilding now so badly depressed.

Engineering industries began early in the Industrial Era to provide machinery and equipment for the collieries, marine engines and ships' fittings generally, locomotives and railway and tramway equipments both for local use and for export. Some of the most famous of marine engineering firms are associated with Tyneside. Ship-repairing interests are well represented and it is a cheap repairing centre. There is a large number of dry docks for this specific purpose and equipment generally is up to date and efficient. Electrical engineering is firmly established within the zone.

Lead workings started here with the ore obtained from the Pennines. A little is still utilised from the North Pennines, but the greater percentage has to be imported, as also are the ores used in the comparatively small copper works. The chemical industry on the banks of the Tyne has largely been centred more recently in Billingham and so allied to Tees-side activities. Flour milling has been established on Tyneside, as for example the flour mill of the Co-operative Wholesale Society at Dunston, where deep water berths are provided for grain vessels. Fishing is mainly centred in North Shields. Oil bunkering facilities have of recent years been formed.

The advantages of Tyneside as a centre of industries are chiefly its favourable location, the abundance and cheapness of coal and so of power, and the accumulation in the area of an industrial momentum and experience. Labour is abundant, and the size of the population is the cause of the considerable import of food, distributed from Newcastle as the railway centre of the region. The nearest contact by sea is with the N.W. European areas but the Tyne is well supplied with steamship services giving it a world contact, while coastwise traffic and roads give the area contact with the immediate hinterland and the more distant parts of the country. Its limitations, as viewed geographically, have already been touched upon. The two main waterway groupings of the North East region make a striking contrast. While parts of a composite realm, the question naturally arises as to which of these has the greatest economic possibilities. The Tyneside region may well have already attained its maximum—the Tees-side region may well yet have it to reach. Both rely upon artificially improved waterways. The penetration inland of shipping by these waterways is in both cases partly restricted by bridges. Contact with the waterway is more restricted in the one than the other. Both have coal resources at hand, the one being on the coalfield, the other immediately next to the least worked portion of the coalfield. The one has no iron ore resources, the other has still some ore resources within its immediate region. The one relies to a considerable extent upon the blast-furnace products of the other. Considerable urban grouping is typical of both, but whilst in one there is restriction of expansion by its built up character, the other has greater spaciousness for any future expansion. Steel and iron manufactures approximate in type in both areas. The chemical industry is now centred largely on Tees-side to the detriment of the Tyne region. In these and other ways can the relative aspects of these two waterway groupings within the whole region be reviewed and it follows that they must be regarded as complementary units within the economic whole.

Other coastal ports are of distinctly a minor character. Blyth, almost within the Tyneside region, has largely been created by the railway. The Blyth outlet has been deepened to 30 ft. L.W.O.S.T. and staiths built for coal export. The port serves as the natural outlet for the Ashington group of collieries—hard steam coal and pulverized coal for steam production on ships being the major types handled. Facilities for coal shipment are reported to be quite satisfactory. Little coasting general cargo trade is carried on and an increase in this respect seems improbable. Ship-breaking facilities exist and occupy a proportion of the population. Its imports consist of pit-props, timber generally, and cement. Amble, on the northern edge of the coalfield, and Seaham Harbour, central of the Durham coast and a completely artificial harbour, represent other exporting points apart from those mentioned.

II.—THE NATURAL RESOURCES OF NORTHUMBERLAND AND DURHAM.

(*Memorandum by Professor H. G. A. Hickling.*)

The surface rocks of the two counties are almost everywhere of Carboniferous age, except in the coastal belt of Co. Durham where Permian rocks overlie the Carboniferous. The lower Carboniferous rocks, which occupy the north and west of the area, consist of many alternating sheets of sandstone, shale and limestone with occasional workable coal seams. The upper Carboniferous rocks lie in the south east, forming the coalfield, with sandstones, shales, clays and many coal seams. The Permian of East Durham consists mainly of magnesium limestone—a rock of considerable economic value. In the Stockton and Middlesbrough area there are also valuable deposits of rock-salt, with gypsum and anhydrite. The ironstone of the Cleveland Hills, actually in Yorkshire, belongs essentially to the economic resources of the North East Coast. In West Durham, an abundant development of mineral veins with lead and other minerals gave rise to the Alston, Weardale and Teesdale mining fields. Excellent road-metal is abundantly obtainable in both counties from the great intrusive lava-sheet known as the Whin Sili.

The economic products of these rocks will be considered in the following order:—

- (1) Coals.
- (2) Ironstone.
- (3) Lead and associated ores.
- (4) Road-metal; Building-stones.
- (5) Clays and Refractory Materials.
- (6) Limestone, Cements, Magnesia.
- (7) Salt, Gypsum and Anhydrite.

Coal.—The coalfields of Northumberland and Durham have been worked on an extensive scale for a longer period than any others in the country. In consequence, although the existing coal reserves are estimated to be sufficient to maintain the present output for about 200 years, this figure only disguises the fact that the best and cheapest coal is very largely depleted.

The fields produce two main classes of coal: steam coals and coking coals. The best coking coals are practically confined to Durham, and this fact together with various geographical factors has resulted in a marked diversity of interest in the coal trade of the two counties and has constituted them in effect two separate fields. The best coking coal area is that which lies south of the Tyne and west of the Wear. The coals of East Durham approximate in character to those of Northumberland, and it is in this part of the Durham field that the largest reserves now remain.

Compared with such fields as Yorkshire, Lancashire and South Wales, the seams in Northumberland and Durham are mostly thin, the two or three thicker seams being largely exhausted. This is a

material disadvantage, though it may be overcome by improved methods of working. The thinness of the seams renders the use of machines somewhat more difficult, but at the same time their employment is essential for cheap production and must be increasingly introduced. This development is at present seriously hampered by the large proportion of working by "pillar and stall" which still continues. These fields have some compensating advantage in that the strata nearly everywhere have only a very gentle inclination, while the dislocations or faults by which the coal seams are affected are neither very numerous nor of great magnitude. They are in these respects similar to the Yorkshire field, and better circumstanced than most others.

The output of steam coals from Northumberland and East Durham far exceeds the possibilities of local consumption, and since these coals possess no qualities of exceptional value the maintenance of this output must depend on cheap production. This may be attained by increased use of mechanical methods of mining, but the net result is likely to be a decrease in the number of men employed. The coking coals of West Durham produce a very high grade of metallurgical coke, on account of their excellent coking qualities and low sulphur content. They constitute the essential reason for the development of the iron and steel industry in the neighbourhood. A large quantity of this coal is consumed locally for coke manufacture, while its high quality facilitates export sale. Most of this coal lies readily accessible at small depth. These circumstances together have resulted in a special degree of depletion of this part of the coalfield, and the output of the best quality of coking coal cannot be expected to continue for any long period. On this account the distinction between the Northumberland and Durham fields must tend to disappear.

The effects of the increasing exhaustion of high-grade coking coal may be modified by the greater use of "blending" in coke manufacture; it is now known that blends of various coals which, individually, have relatively poor coking qualities can produce a high-grade product. A more doubtful factor is the possible treatment of coals by *partial* hydrogenation, by which good coking qualities may be conferred on many coals. It is clear in any case that these or other methods of treatment, being applicable to the coals of any coalfield, cannot maintain the special pre-eminence of the Durham field.

The various seams of the Northumberland and Durham coalfield, like those of other fields, differ widely from one another in quality, and the local practice of mixing together the output of the several seams worked at any pit results in a marketable product of more or less variable quality though every effort may be made to maintain its constancy. It can scarcely be doubted that this result exercises an adverse effect on the sale of the coals from this field in competition with those from Yorkshire and elsewhere where the practice is to market each seam separately. The

systematic study of the seams of this area now being made by the Fuel Research Board is bringing to light the special qualities of the individual seams, and will form a valuable index to the special uses to which each seam is best adapted.

Lower Carboniferous Coals.—Outside the area of the coalfields proper there are substantial coal resources in the lower Carboniferous rocks. Well-known seams are the Scremerston coals near Berwick, the Shilbottle coal in mid-Northumberland and the Little Coal in South West Northumberland. These and other seams collectively cover a very considerable area. The coals are generally of good quality. The great obstacle to their large-scale exploitation is their distance from the main industrial centres and, in most cases, from the coast, while the facts that as a rule one seam only can be worked at any given place, and that the seams are all thin, tend further to restrict their development. These lower seams do not extend in workable condition into the county of Durham.

Iron Ores.—The association of iron with coking coal in Durham is the historical reason for the development of the iron industry of the area. That industry is now almost entirely dependent on ore from outside the two counties, but the local supply of metallurgical coke serves to perpetuate the industry in this locality.

In Northumberland and Durham iron ore occurs as clay-ironstone in the Coal Measures and as vein-ironstone in the Carboniferous Limestone series. The clay-ironstone was worked in many parts of the coalfield. The most extensive workings were in the Derwent Valley, but there as elsewhere economic working has long been impossible.

The veins of Weardale and Alston Moor yield ore in the form of siderite or limonite, usually in association with lead but in some cases without. Working of the ore continued until after the War, but the relatively small quantity of ore available, the distance from easy transport and the fact that nearly all the ore above the natural drainage level of the mines had been won compelled the closing down of this area.

The Cleveland ironstones, though in Yorkshire, belong naturally to the resources of the North East Coast, and since 1836 have been the foremost supply for the Durham industry. The best Cleveland ore is largely exhausted, but there are large reserves of slightly inferior ore, and this is blended with foreign or non-local ore. Cumberland ore is also largely used and is likewise blended. The Durham industry has long made extensive use of imported ores, and even if the Cleveland ore entirely failed (which it cannot do for many years) there would be no reason to suppose that the blast furnaces must be crippled.

Lead and Zinc.—The north Pennine area was the most extensive British lead mining district. It is naturally divided into the Wensleydale and Swaledale fields in Yorkshire, which have long been economically exhausted, and the Teesdale, Weardale and Alston Moor fields in which a few mines are still in operation.

The majority are closed, and the remainder are much reduced. Many rich veins have in the past been exploited by large-scale mining and have yielded a large amount of ore. In practically all cases the veins show marked impoverishment as they are followed deeper, and this, together with vastly increased working costs and increased competition of foreign ore, has made further working uneconomic.

The Weardale district is exceptional in that much of the ore is found in extensive horizontal sheets or "flats," in addition to the usual vertical fissure-veins. The flats are workable more cheaply than the veins and have contributed materially to the survival of the Weardale mines. It is evident, nevertheless, that these are near the limit of their economic life unless new flats should be discovered.

In South Northumberland the mines of East and West Alledale form a continuation of the Alston Moor group. North of the Tyne there is no indication of the existence of ore in substantial quantity, except at the Settlingstones Mines, north of Haydon Bridge.

The zinc ores occur with those of lead and do not call for separate comment. In paying quantities they were practically confined to the Alston Moor and Alledales districts.

Barytes and Witherite.—Barytes (barium sulphate) is commonly found in association with lead in the mineral veins, though not as a rule in paying quantity. In some upper Teesdale mines it was present abundantly and that district recently provided a substantial proportion of the British output. Another Durham source of exceptional character was a vein of very pure barytes found in the New Brancepeth and Ushaw Moor collieries, where it is worked along with the coal, the two collieries yielding about 15,000 tons per annum, or about half the total Durham output.

Witherite (barium carbonate) is a much less common mineral, and the Settlingstones mine in Northumberland was lately the only mine in Britain which produced it in large quantity (5,000 to 7,000 tons per annum). Another considerable deposit has recently been found and worked at Aunfield Plain, in Durham.

Fluorspar.—Durham shares with Derbyshire the chief British production of fluorspar, which is second only to that of the U.S.A. It is noteworthy that nearly half the British production is exported to U.S.A.

The production is dependent on the working of the lead-veins or flats in which the fluor occurs, though in one Weardale mine it has become the main product. The bulk of the fluor is used as a flux, but it should be observed that the Durham fluor includes a large proportion of very exceptionally pure and well-crystallised mineral. The finest crystals are of considerable value for optical instrument manufacture, and Durham is certainly capable of providing material for this purpose. Upper Weardale is the most productive area.

Road Metal.—The two counties possess a very large quantity of the finest road-metal in the North of England in the dolerite rock of the "Whin Sill." The quarrying of this rock already constitutes a substantial industry, and there is every reason why it should extend. The rock outcrops in an almost continuous band from near Bamborough in the north to Teesdale in the south, and the reserves are practically unlimited. There are many sites where the rock is accessible for large-scale quarrying and suitably situated for transport facilities.

The present great demand for road-metal has already resulted in the development of numerous quarries in this rock. Most of these are on a relatively small scale, and there is undoubtedly ample opportunity for the development of operations on a much greater scale. It is unfortunate that the one large-scale project so far launched for this purpose was planned to exploit that portion of the Whin Sill which makes one of the finest natural features in Northumberland and forms the environs of the Roman Wall, but it is to be hoped that the very natural opposition to that venture will not prevent the development of similar schemes elsewhere. There is a real opportunity for new development.

This development must react in a minor degree on the coking and by-product industry, since the majority of the road-metal must now be supplied in tar-coated form for "Tar-mac." road-making.

Building Stone.—Northumberland is well provided with building stones of excellent quality. They are not only used locally, but have been and are still sent so far as Edinburgh, notwithstanding the high quality of the stone available near that city. Notable examples are the "Black Pastures" stone worked at many localities in Redesdale, the Doddington and Denwick stones, the Blackster (or Blaxter) stone and the Prudham stone. All these are excellent freestones belonging to the Carboniferous Limestone series. In another group is the "Grindstone Sill" in the Coal Measures, still worked near Newcastle on a small scale for the manufacture of grindstones.

Reserves of these stones are practically unlimited, but it is to be feared that the development of ferro-concrete construction for large-scale building renders any serious development of freestone quarrying impossible.

Durham is less richly endowed with freestones. It has certain limestones which are worked for ornamental stone, the best-known being the "Frosterley Marble", very extensively worked in Weardale.

Brick-Clays and Refractory Materials.—The district is amply provided with material for the making of bricks of all qualities. It is fortunate in the possession of extensive deposits of superficial clays formed as the sediments of glacial lakes in the lower parts of the Tyne, Team, Sleekburn and other valleys, which are very easily worked and suited to the manufacture of bricks of fair

quality. The deposits are very extensive, but are comparatively thin, and consequently involve the working-over of large areas of ground which are thereby rendered temporarily useless for other purposes. The material is unsuited to the manufacture of bricks of the highest quality.

A better and still more extensive supply of material exists in the clays and shales of the Coal Measures. This supply is being exploited by a few manufacturers who are producing bricks of high quality, and it would certainly seem to be desirable that these materials should be utilised more extensively. There is no reason why the district should not be more than self-supporting in the production of bricks of any grade.

Refractory materials.—There are two sources of supply, the fireclays and the gannisters of the Coal Measures and the lower Carboniferous rocks. The fireclays are widely distributed and usually occur immediately below the coal seams. They are suited to the manufacture of common firebrick and similar products. Gannister is less abundant. It is found chiefly in Durham in the lowest portion of the Coal Measures and in the underlying rocks. It is suited to the production of the highest grade silica bricks for furnace lining and similar uses. There is certainly a large reserve of this rock in the south west and west of Durham, but so far as yet known the supply within the coalfield area is limited. In this respect Northumberland and Durham are at some disadvantage compared with South Yorkshire, where large supplies of excellent gannister exist in immediate association with the coal. It ought not to be the case, however, (as recently reported) that the greater part of the more refractory fire-brick is brought into the district from elsewhere.

Limestone and Dolomite.—The Carboniferous limestones of Northumberland and Durham are now worked much less than in former times, partly because of diminished use in agriculture and partly on account of the cheap production elsewhere of lime of high quality for building and other purposes. In Northumberland most of the individual limestone beds are too thin to permit of really large-scale quarrying on an economic basis, while the limestone itself is more or less impure. The same applies in a less degree to the limestones of Durham. It is at least doubtful whether the local Carboniferous supplies can compete effectively with the pure lime of Derbyshire and North Wales, or with the natural facilities for cement manufacture in East Yorkshire.

The most important local asset is the Magnesian Limestone of East Durham. Much of this is too impure and broken to be of great value, but the lower Magnesian Limestones which form the western portion of the outcrop are compact and regular alternations of magnesian and non-magnesian limestone. In modern working the different beds are used separately for cement manufacture, for "burnt dolomite" (used as a basic refractory in iron smelting), for chemical manufacture and for other purposes. There is no

limestone of similar quality outside Durham. Its use has greatly extended during recent years, and with careful consideration of the most appropriate use of the different qualities there seems every reason why it should extend further. The supplies are very large.

Rock-Salt, Gypsum and Anhydrite.—The Tees mouth district of Durham, though far behind Cheshire, is the second largest salt-producing district of Britain. Its actual salt reserves may be not much less than those of Cheshire, but the main salt bed lies at a much greater depth (1,000 to 1,500 feet) below the surface. The salt is all worked by pumping. The salt bed is thickest (119 feet) near the southern limit of the present borings. There are probably large reserves further south which will be available unless the increasing depth of the deposit in that direction interferes with its economic exploitation.

Associated with the salt are considerable deposits of gypsum and anhydrite, but their depth until recently prohibited their use. Anhydrite, formerly regarded as worthless, is now being worked and used on a large scale in chemical manufacture at Billingham.

III.—AGRICULTURE.

(*Memorandum by Mr. D. H. Dinsdale.*)

I.—*Brief descriptive Account of the Agriculture of the Area.*

A brief description of the systems of farming which are characteristic of the Area seems to be desirable at the outset. Generally speaking, the area corresponds in extent with the Northumberland and Durham coalfields and the Tees-side industrial area. It extends, therefore, from the Tees to the Aln, and is bounded on the west by a line drawn from Alnwick, through Morpeth, and passing west of Newcastle to include the Derwent Valley, Durham City, and Weardale, as far west as Bishop Auckland, whence the line passes eastwards towards the coast, but excluding the major portion of South East Durham which centres round Sedgefield and Darlington. The area would also include the land lying on either side of the Tees mouth, and westwards as far as Stockton. The whole of this area contains a dense industrial population well distributed in numerous towns and villages, and catered for by ample transport facilities. The existence of this large industrial population has had a profound effect upon the local farming which has evolved a system dependent to a very large extent on the proximity of local markets.

The prevailing type of farming is the mixed dairy and cropping farm whose output consists of

- (a) fluid milk, which is either retailed locally or sold to local wholesalers ;
- (b) saleable crops, such as potatoes, which are sold within the area and hay and oats which, under normal conditions, found a market in the collieries and transport undertakings throughout the district.

Other cereal crops, such as wheat or barley, while not of outstanding importance, are included in cropping acreages in accordance with the principles of rotational cropping. For similar reasons, the main root crop is turnips or swedes. The bulk of this crop is fed to stock, but a small proportion is sold for human consumption. Generally speaking, the farms are of the "family" type, that is to say that, by and large, they are of a size which, under ordinary conditions, is capable of providing a livelihood for the average family without having recourse to hired labour.

The significance of the local market provided by a dense industrial population is apparent when other parts of the whole North Eastern Area are considered. In South East Durham, for example, the area bounded roughly by Sedgfield, Stockton and Darlington is concerned more with stock feeding and stock raising, while cereal growing assumes greater importance. Further west in Teesdale, Weardale, and in Upper Tynedale, physical conditions limit the farming possibilities to stock raising; and the breeding of dairy cows, and sheep farming on the hills characterise this district. During the last 20 years the development of transport facilities has encouraged a certain amount of fluid milk selling from the dales, but, on the whole, stock raising is still the main feature of this part of the country.

It is interesting to note that in June, 1930, there were 5,959 agricultural holdings in the county of Durham over one acre in size. Of this, 59.8 per cent. were under 50 acres and 76.3 per cent. were under 100 acres.

At this stage it is well to point to a distinction between the counties of Durham and Northumberland, a distinction which is important when considering the agricultural statistics for the separate counties. The major part of Durham County is characterised by the mixed dairy and cropping farm which has already been described and the same applies to South East Northumberland within the area previously defined. The greater part of Northumberland, however, presents agricultural conditions of quite a different order. Central Northumberland, from the Tweed to the Tyne, west of the coalfield and east of the Cheviots and Pennine hills, is very largely devoted to the feeding of cattle and sheep. Most of this area is under grass although in parts the arable acreage may be as much as 30 per cent. of the farm. Tweedside is still an area of relatively large farms, with a high proportion of land under the plough, concerned with the production of mutton and beef, with barley as the main link between the crop and livestock enterprises.

The Cheviots and the Pennine slopes are almost wholly devoted to sheep breeding and Northumberland is still the most important sheep county in the country. The "average" size of farm in Northumberland has little significance as the farms range from the relatively small mixed dairy farms, corresponding with the Durham holdings, to farms of nearly 2,000 acres where the summer

and winter feeding of stock are the main enterprises. There are many hill sheep grazings which are reckoned in thousands of acres.

In any consideration of the prosperity of agriculture in the North East Coast Area, an essential point, which is a commonplace amongst the farming fraternity, is the economic dependence of the local agriculture upon the local markets.

It is somewhat curious that despite the presence of a large industrial population, intensive market gardening is not a strong feature. There are, however, concentrations of market gardeners near Morpeth, in lower Tynedale within easy reach of Newcastle, along lower Tyneside towards the coast, on the outskirts of the Tyneside boroughs and of Sunderland, and to a lesser extent on the outskirts of West Hartlepool, Darlington and Middlesbrough. On the other hand, allotment gardens are found in practically every village and town throughout the area. Generally speaking, the allotment holder regards his allotment as a supplement to the household budget and a recreation, and not as a commercial enterprise.

There are signs, however, that the Area contains a nucleus of intensive market gardeners who specialise in culture under glass. These are concentrated round the main towns in the Area.

II. *The Trend of Employment in Agriculture in the Area.*

Certain considerations of a general character will be stated as a preliminary to the examination of this question.

1. In the first place there is a widely accepted view that the amount of employment which agriculture can offer is dependent on the proportions between arable and grassland under cultivation, and that a ploughing out policy will inevitably increase the numbers of agricultural workers. There is a good deal of historical evidence to show that at certain periods the laying away of land to grass has coincided with a decrease in the rural population.

Under present day conditions this general conclusion requires qualification (see article by King)*; King, after examining certain evidence, suggests the following modifications :—

(i) The proportion of land under arable cultivation is not of itself an indication of its capacity for providing employment for labour.

(ii) The labour requirements of farms are influenced mainly by the system of farming practised, i.e., by the amount of stock carried and the character of the crops grown. The labour requirements of different kinds of stock and the several kinds of crops vary very widely.

(iii) The effect of a tendency to an increase or a decrease in the cultivation of arable land upon labour requirements will depend upon the resultant changes in the farming system. The effect may be either to increase or to decrease the total labour employed. A decrease in arable cultivation accompanied by an increase in dairying may be consistent with an increase in employment.

These modifications of the general principle are specially relevant when considering the North East Area in which the mixed dairy and cropping farm is the prevailing type.

* Agricultural Progress, Vol. iv., 1927.

2. There are two sources of statistical information available in regard to the numbers of agricultural workers, viz., the population Census and the annual agricultural returns. In the present Report no use is made of the population Census, and what follows is based on the annual agricultural returns. The latter have been chosen because they have been collected annually since 1921 on a uniform basis, while the Census figures available refer to 1921 only, and owing to differences in compilation and classification it is almost impossible to reconcile the Census figures with those given in the agricultural statistics. It may be noticed, however, that the returns of workers employed, for the purpose of the agricultural returns, do not include the occupier, his wife and domestic servants. Moreover, they refer to the position each year on the 4th June, a point of some importance when the numbers of casual workers are being considered.

3. No statistical information regarding the volume or incidence of agricultural unemployment exists. Such workers are excluded from the operation of the Unemployment Insurance Acts, the administration of which gives very full information on this question in relation to those industries within the scope of the Acts.

Moreover, the conditions under which agricultural workers are engaged make it difficult to decide who is an unemployed agricultural worker. In the North of England the system of long term engagements (six months or one year) is general, and engagements are made at fixed dates—the May and November terms. In consequence, a man who fails to secure an engagement at term time will realise that he has very small prospect of regular agricultural employment for the ensuing six months and will, therefore, either seek other employment forthwith (in which case he ceases to be an agricultural worker), or depend on casual agricultural employment. It may well seem, therefore, that there is no apparent volume of unemployed agricultural workers, when there is in fact a drain of men from the industry—since men who, having failed to secure farming work, and gone to some other occupation, are unlikely to return to agriculture at a later stage.

It is impossible, however, to provide any statistical measure of this drain in relation to the numbers employed in the industry.

4. There is reason to suppose that the exclusion of agriculture from the scope of unemployment insurance has definite effects on the volume of employment. On the one hand it acts as an incitement—especially to young workers—to seek employment in insured trades for the sake of the economic security which the Acts offer. On the other hand, it tends to encourage agricultural employers to retain labour which would otherwise be left in a most precarious condition. The personal interest between the farmer and his men has not yet disappeared.

It is probable that the extension of the unemployment insurance principle to agriculture would lessen the scruples of employers who are on the margin of profitable farming, and result in the discharge of men who at present are retained from motives which are mainly humanitarian.

Again, the precise measurement of these influences is not possible.

5. A further consideration of a general character concerns the various categories of agricultural workers. The problem here is one of definition as between regular and casual workers. The whole "fund" of agricultural labour consists of :—

- (a) workers in regular employment under one employer.
- (b) itinerant workers who are employed by a succession of employers but who find employment in agriculture throughout the year.
- (c) workers wholly engaged in agriculture who are unemployed for some part of the year.
- (d) workers employed mainly in agriculture and to a lesser extent in some other occupation.
- (e) workers temporarily engaged in agriculture on seasonal work, who do not seek agricultural employment at other times.

The enumeration of agricultural workers in employment on the 4th June in any year may include each of these categories. The returns distinguish between regular and casual workers, with subdivisions for male and female, under and over twenty-one years of age, but the time of year at which the returns are made presents the volume of employment, if anything, in a favourable light.

6. Referring to the considerations advanced in Para. 1 of this section, the prevailing system of farming in the North East Coast Area is so organized that the demand for labour is fairly uniform throughout the year. The slackening of demand for field work in the winter months is offset by the increased attention necessary while the dairy herd is indoors, while the peak periods of demand for field labour in the seasons of sowing, root singling, hay and corn harvests, correspond largely with the time when the dairy herd remains outdoors. The dovetailing between livestock and cropping requirements allows of the bulk of the work being done by a force of labour regularly employed, requiring supplementation by casual labour only at periods of peak demand such as those referred to above. The amount of casual labour which may be required depends very much on seasonal influences affecting the preparation of land, seed germination and growth.

7. The influence of the form of wages agreement must not be lost sight of. It is a long period engagement which tends to keep in employment men who might otherwise be stood off in slack periods. The custom is still in force in the North of England to a much greater extent than in the south and this explains in some degree—apart from the question of reduced arable acreages—why references to increasing agricultural unemployment have been concerned with south country areas.

8. The actual numbers of agricultural workers, classified as regular, males and females, under and over twenty-one years of age, and casual, males and females, in employment on the 4th of June each year from 1921 onwards (excepting 1922 when the statistics were not published) in the counties of Durham and Northumberland, and in England and Wales, are set out in Table A. In a further Table B, these figures have been reduced to a comparative basis, taking the year 1924 as 100, so that the trend of events may be better appreciated.

9. The figures reveal certain notable trends. The year 1924 is taken as a basis for comparison because it marks a point of relative stability following the readjustments made necessary by the severe break in prices in 1921.

In the county of Durham, the total numbers employed (on 4th June each year) regular and casual, show a steady though slight decline. The decline, however, is confined to the casual group. Actually the numbers of regular men employed in 1930 were approximately $7\frac{1}{2}$ per cent. more than in 1924. The numbers of regular women employed were the same in 1930 as in 1924, though fluctuations have taken place in the intervening years. Casual employment, however, over the same period had declined by 31 per cent.

Bearing in mind what is said in an earlier section regarding the influence of farming systems on the demand for labour, it seems proper to infer that the upward trend in the numbers of dairy cattle and other cattle, despite a slight reduction in the arable acreage in this county, has maintained and strengthened the demand for regular workers at the expense of the casual group. The long term wages agreement together with the relative inflexibility of wages as a result of the operations of the Agricultural Wages Committee would naturally suggest a reduction in the volume of casual labour as a means of reducing the total wages bill to meet the falling price level.

10. So far as the county of Northumberland is concerned a similar trend is noticeable, although the increase in the volume of regular employment is much less marked. The numbers of regular women employed have declined since 1924, and the fall in the volume of casual employment is rather more than in the case of County Durham. It needs to be remembered, however, that in this county there is a considerable range in farming types and it may be stated, as a matter of opinion, in the absence of statistical confirmation, that the demand for labour has been maintained only in the mixed dairy farming area in the south east of the county and the hill sheep grazing districts in the west and north west.

11. It should be remembered that these figures relate to the numbers in employment on agricultural holdings over one acre in extent on the 4th June each year. At this time of year in a normal season, root singling is in the early stages and haymaking has not

begun. On most Durham farms, therefore, unless the root acreage is large, the labour force is not likely to need supplementation by casual labour.

12. Some caution is necessary in drawing conclusions from the Northumberland figures because of the wide range of farming types represented. There is no dominating system of farming in this county (see descriptive account of farming in introductory section).

III. *The Changing Emphasis in Farming in the Area during the Post-war Period.*

1. The evidence bearing on farming readjustments to the price situation, provided by the annual agricultural returns is summarized below. The statistics relating to Durham County alone are taken, as those for the North Riding and for Northumberland are confused by reason of the wider range of farming types represented. It is considered safe to assume that the changes shown to have occurred in Durham find a parallel in the south east of Northumberland and in the Cleveland district of Yorkshire.

2. The average of the years 1911-1914 is adopted as the basis for comparison, and the Tables C, D, E, and F in the Appendix show the changes which have occurred in the arable acreage in Durham, together with the changes in the numbers of various kinds of livestock.

3. So far as the arable acreage is concerned, there has been a steady decline each year since 1924, with the exception of 1926, and the present trend is downwards. The decline is marked particularly in respect of the acreage devoted to cereals, and roots other than potatoes. The potato acreage, which is normally fluctuating in character, has, on the whole, increased. The tendency to lay land down to grass is evident in the increase in the acreage of rotational grasses, which has been achieved in part at the expense of the root crops other than potatoes. The relative cheapness of purchased foodstuffs during recent years coupled with changes in the methods of feeding for milk production, are further factors tending to encourage the reduction of the acreage under roots.

4. While the fall in the amount of land under the plough might normally be expected to lead to reduced demand for labour, the figures presented in the previous section indicate that this expectation has only been realised in Durham in respect of casual labour. The increase in the livestock population, and particularly in respect of dairy cattle, explains how demand for regular labour has been maintained and in fact, increased, despite the greater inflexibility in wage rates as a result of the operations of the Agricultural Wages Committee.

5. The analysis of the changes in livestock population reveals that, as compared with the pre-war numbers, cows in milk have increased by approximately 10 per cent., and other cattle (which include the younger dairy stock as well as feeding cattle) by 11 per cent. Breeding ewes and lambs have increased in numbers by 22 and 24 per cent. respectively, but other sheep over one year old have decreased by 30 per cent.—a manifestation of the known trend towards more rapid turnover, quicker maturity, and smaller joints to meet consumers' requirements. The pig population is subject to wide fluctuations but the numbers of breeding sows are somewhat higher than in the pre-war years. It is to be noted that pigs are kept in many cases as a source of outlet for milk surplus to the requirements of the liquid milk market.

6. Poultry stocks have not always been separately enumerated in the annual agricultural returns, but the following figures are available to indicate that the Area has shared in the general and marked expansion of poultry husbandry throughout the country during the past decade. The figures relate to the numbers of fowls on agricultural holdings over one acre in extent and take no account of small specialised poultry enterprises and backyard flocks.

*Numbers of Fowls on Agricultural Holdings over one acre.
County Durham, 1921-1930.*

			<i>Index.</i>
1921	...	279,513	100·0
1924	...	311,392	111·4
1926	...	371,000	132·7
1927	...	403,968	144·5
1928	...	398,377	142·5
1929	...	434,598	155·5
1930	...	468,574	167·6

7. The general bearing of this analysis of cropping acreages and livestock population is—

- (a) to emphasize the importance in local agriculture of produce for local consumption, and
- (b) to indicate the significance of livestock husbandry as a main source of demand for agricultural labour.

8. The course of prices since 1924 for those forms of agricultural produce which are important locally, is illustrated by a further Table G, in which the indexes of prices for All Agricultural Produce, Barley, Fat Cattle, Fat Sheep, Eggs, Milk, and Potatoes, are compared with the Board of Trade Index of Wholesale Prices since 1924. The depression in cereal prices (barley) compares most unfavourably with the slower decline in the prices of livestock and livestock products. The strength of milk and egg prices considered in relation to the rapidity of turnover in these branches, suggests one reason why dairying and poultry husbandry have undergone the expansion to which attention has already been drawn.

IV. *Future Possibilities.*

1. The absence of an acute problem of agricultural unemployment in the Survey Area at the present time results from the general trend of agricultural development outlined in Section III. Indeed had it not been for the prevailing weakness of the general industrial demand for labour in the mining area, it is probable that the local agricultural industry would be faced with a problem of labour shortage.

An improvement in the general industrial situation might be expected to lead to a continuance of the steady migration of younger workers to insured trades which offer a measure of economic security not provided by agriculture except in so far as the long term engagement operates in the case of those workers finding employment. On the other hand, an improvement in the general industrial situation would react favourably on local agriculture in so far as it strengthened the consumptive demand for beef, mutton, milk, eggs, and vegetable produce.

2. Displacement of agricultural labour as a result of mechanization is not likely to be significant in this Area in the immediate future. The prevailing type of farm offers few opportunities for the introduction of power machinery and equipment such as would be likely to replace any considerable volume of manual labour.

3. So far as the development of new branches of agriculture, or the extension of established enterprises such as market gardening, or poultry farming, are concerned, it is extremely difficult to make any reliable forecast. Under existing marketing arrangements, i.e., in the absence of any organization for orderly marketing, with all that the term implies in respect of standardization and collective bargaining, it is probable that any appreciable increase in the volume of local production will lead to the creation of local surpluses which will react unfavourably on prices and consequently, on future expansion.

In the case of poultry husbandry particularly, there has been a remarkable expansion of local egg production during the last ten years, accompanied by a steady increase in the volume of imported eggs. There is a prevailing belief that this strong demand for eggs is in part a reflection of changing public taste for lighter meats, which may be the result of the reduced physical demands upon large numbers of manual workers in the Area. It seems likely that the limit of profitable expansion will be reached in the near future.

4. Moreover, the presence of local consuming markets tends to act as a barrier to the organization of producer-owned selling agencies capable of undertaking the processing functions involved in modern marketing methods. The success of National Mark

Schemes for the orderly marketing of produce from areas mainly exporting has not been repeated in this consuming area owing to this difficulty. Any attempt to make use of poultry husbandry or intensive market gardening, within the area, to stimulate the demand for agricultural employment must have full regard for the simultaneous development of a marketing organization which will offer reasonable hope that producers will receive returns at least sufficient to maintain the increased volume of production.

5. The position of market gardening and horticulture in the Area is obscure, owing to the lack of systematized information. It is understood, however, that this phase of the problem is being investigated directly by the Ministry of Agriculture and, for this reason, no special reference is made in this Report to this aspect of the subject.

TABLE A.—Total Workers (see definition) employed on Agricultural Holdings in each county, classified as Regular, Male and Female, under and over 21 years, and Casuals, Male and Female. With similar figures for England and Wales.

Indexes.	Class of Worker.	1921.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.	
DURHAM	Regular {	Men + 21	4,147	3,748	4,068	4,084	4,257	4,209	4,291	4,292	4,344
		" — 21	1,820	1,847	2,013	2,223	2,126	2,182	2,197	2,185	2,198
		Total Men	5,967	5,595	6,081	6,307	6,383	6,391	6,488	6,477	6,542
	Casual {	Women	2,047	1,561	1,727	1,632	1,695	1,679	1,765	1,686	1,728
		Men	1,496	999	1,214	1,324	1,160	990	1,014	1,032	927
		Women	1,932	1,746	1,954	1,941	1,646	1,602	1,452	1,342	1,267
		Total Regular ...	8,014	7,156	7,808	7,939	8,078	8,070	8,253	8,163	8,270
		Total Casual ...	3,428	2,745	3,168	3,265	2,806	2,592	2,466	2,374	2,194
NORTHUMBERLAND	Regular {	Men + 21	6,046	5,529	5,734	5,723	5,795	5,707	5,748	5,675	5,799
		" — 21	2,048	1,839	1,890	1,985	1,859	1,961	1,945	1,965	1,946
		Total Men	8,094	7,368	7,624	7,708	7,654	7,668	7,693	7,640	7,745
	Casual {	Women ...	2,863	2,379	2,355	2,382	2,326	2,373	2,393	2,308	2,221
		Men ...	1,433	1,040	1,184	1,330	1,108	943	1,056	1,035	817
		Women ...	1,076	982	1,122	1,114	965	843	873	839	762
		Total Regular ...	10,957	9,747	9,979	10,090	9,980	10,041	10,086	9,948	9,966
		Total Casual ...	2,509	2,022	2,306	2,444	2,073	1,786	1,929	1,874	1,579
ENGLAND AND WALES.	Regular {	Men + 21	456,783	426,925	441,491	441,944	455,904	452,835	454,151	451,706	445,708
		" — 21	155,289	138,898	140,772	137,469	135,508	134,238	129,033	125,267	118,804
		Total Men	612,072	565,823	582,263	579,413	591,412	587,073	583,184	576,973	564,512
	Casual {	Women ...	73,180	59,477	62,276	59,940	62,949	62,629	67,418	67,004	65,337
		Men ...	131,253	104,089	114,994	114,748	98,931	85,112	86,953	90,897	80,241
		Women	52,678	42,998	46,930	49,237	41,607	39,635	35,270	35,378	31,606
		Total Regular ...	685,252	625,300	644,539	639,353	654,361	649,702	650,602	643,977	629,849
		Total Casual ...	183,931	147,087	161,924	163,985	140,538	124,747	122,223	126,275	111,847

TABLE B.—*Proportionate Changes in the Numbers of Agricultural Workers in Various Groups in Durham and Northumberland, 1921-1930, as compared with England and Wales as a whole.*

(1924 = 100.)

Indexes.	Class of Worker.	1921.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.
DURHAM	Regular Men ...	98·1	92·0	100	103·7	105·0	105·1	106·7	106·5	107·6
	„ Women ...	118·5	90·4	100	94·5	98·1	97·2	102·2	97·6	100·1
	Total Regular ...	102·6	91·6	100	101·7	103·5	103·4	105·7	104·5	105·9
	„ Casual... ..	108·2	86·6	100	103·1	88·6	81·8	77·8	74·9	69·3
NORTHUMBERLAND	Regular Men ...	106·2	96·6	100	101·1	100·4	100·6	100·9	100·2	101·6
	„ Women ...	121·6	101·0	100	101·1	98·8	100·8	101·6	98·0	94·3
	Total Regular ...	109·8	97·7	100	101·1	100·0	100·6	101·1	99·7	99·9
	„ Casual ...	108·8	87·7	100	106·0	89·9	77·5	83·7	81·3	68·5
ENGLAND AND WALES.	Regular Men ...	105·1	97·2	100	99·5	101·6	100·8	100·2	99·1	97·0
	„ Women ...	117·5	95·5	100	96·2	101·1	100·6	108·3	107·6	104·9
	Total Regular ...	106·3	97·0	100	99·2	101·5	100·8	100·9	99·9	97·7
	„ Casual ...	113·6	90·8	100	101·3	86·8	77·0	75·5	78·0	69·1

TABLE C.—Changes in the Arable Acreage in Durham County.
1911-14 (average) and 1921-1930.

	Average 1911-14.	1921.	1924.	1925.	1926.	1927.	1928.	1929.	1930.
Numbers of Acres :—									
Arable Land	143,525	160,446	153,076	151,170	150,612	146,237	144,251	141,405	139,659
Rotation Grasses	41,226	40,016	43,185	41,388	41,886	42,375	43,571	41,105	42,412
Cereals :	62,276	77,759	69,389	66,880	67,311	64,593	61,425	62,250	60,479
Wheat	12,348	19,607	15,419	13,769	15,172	15,907	10,220	13,335	14,404
Barley	18,123	20,178	14,731	14,642	11,581	10,882	11,460	9,266	8,523
Oats	31,805	37,974	39,239	38,469	40,558	37,804	39,745	39,649	37,552
Potatoes	12,021	12,353	11,692	12,453	12,600	14,668	13,422	14,237	12,983
Turnips and Swedes	19,098	18,181	18,380	18,403	18,164	15,661	15,830	15,907	15,728

TABLE D.—DURHAM COUNTY.
Indexes relating to the Acreage of Arable Crops.
(1911-14=100.)

	1911-14.	1921.	1924.	1925.	1926.	1927.	1928.	1929.	1930.
Acreage :—									
Arable Land	100	111·8	106·7	105·3	104·9	101·9	100·5	98·5	97·3
Rotation Grasses	100	97·0	104·8	100·4	101·6	102·8	105·7	99·7	102·9
Cereals	100	124·9	111·4	107·4	108·1	103·7	98·6	99·9	97·1
Potatoes	100	102·8	97·3	103·6	104·8	122·0	111·7	118·4	108·0
Turnips and Swedes	100	95·2	96·2	96·4	95·1	82·0	82·9	83·3	82·4

TABLE E.—DURHAM COUNTY.
Numbers of Livestock on Agricultural Holdings over One Acre.
 1911-14 (average) and 1921-30.

	1911-14.	1921.	1924.	1925.	1926.	1927.	1928.	1929.	1930.
Cows in milk	23,475	22,535	24,308	25,585	25,869	25,863	26,220	25,624	25,800
Ewes	85,745	70,039	82,368	88,477	93,180	99,334	98,832	101,235	104,709
Lambs	96,561	80,277	93,045	99,074	107,908	118,823	110,039	115,598	119,718
Sheep (over 1 year old)	56,464	41,549	46,526	46,707	45,990	44,137	46,642	39,490	39,986
Cattle	47,798	41,905	47,610	51,986	50,102	51,653	52,665	54,435	52,905
Sows	2,772	3,027	3,728	3,006	2,836	4,094	3,612	2,694	2,959
Other Pigs	12,200	15,560	15,800	15,997	13,437	18,976	20,663	13,412	14,569

TABLE F.—DURHAM COUNTY.
Indexes Relating to the Numbers of Livestock.
 (1911-14 = 100.)

	1911-14.	1921.	1924.	1925.	1926.	1927.	1928.	1929.	1930.
Cows in milk	100	96·0	103·5	109·0	110·3	110·1	111·7	109·2	109·9
Ewes	100	81·7	96·1	103·2	108·7	115·8	115·3	118·0	122·1
Lambs	100	83·1	96·4	102·6	111·8	123·0	114·0	119·7	124·0
Sheep (over 1 year old)	100	73·6	82·4	82·7	81·5	78·2	82·6	69·9	70·8
Cattle	100	87·7	99·6	108·8	104·8	108·1	110·2	113·9	110·7
Sows	100	109·2	134·5	108·4	102·3	147·7	130·3	97·2	106·7
Other Pigs	100	127·5	129·5	131·1	110·1	165·5	169·4	109·9	119·4

TABLE G.—*Comparison of Fluctuations in the Prices of Agricultural Products and the General Level of Wholesale Prices.*

Year.	Board of Trade Wholesale Prices General Index.		Ministry of Agriculture Index of Prices of Agricultural Products during each harvest year Sept. to Aug.						
	January to December.	September to August.	General.	Barley.	Fat Cattle.	Fat Sheep.	Eggs.	Milk.	Potatoes.
1924... ..	100	—	100	100	100	100	100	100	100
1925... ..	95·9	89·7	94·4	79·4	96·7	81·2	97·6	99·4	58·2
1926... ..	89·1	86·9	90·7	87·9	86·8	76·1	89·2	95·3	76·4
1927... ..	85·1	85·1	90·7	87·9	89·4	82·7	87·4	93·6	75·5
1928... ..	84·4	82·8	88·9	79·4	83·1	79·7	93·4	97·7	53·6
1929... ..	82·2	76·5	85·2	62·4	88·7	81·2	88·6	95·9	33·4
1930... ..	72·0	—	—	—	—	—	—	—	—

IV.—THE COAL MINING INDUSTRY.

(Memorandum by Mr. E. D. McCallum.)

(i) **Introductory: Importance of the Coal Industry in the Economy of the North East Coast.**

1. The economic importance of the coal mining industry in the economy of the North East Coast district of England scarcely requires emphasis. For several generations the dependence of the economic well-being of the Area upon the prosperity of the coal trade has been generally, if somewhat vaguely, recognised, but it may be hazarded that the extent of the dependence has been appreciated only by a few. It is well, therefore, to indicate briefly the importance of the industry in the economy of the Area.

2. A number of measures suggest themselves by which the position of the coal industry among the industries of the Area can best be appreciated but two, namely, the numbers of persons employed in or attached to the industry, and the value of the net output of the industry are on the whole the most satisfactory for this purpose. With regard to the first of these measures statistical information is available in the Reports of the 1921 Census of Population and in the figures provided by the Ministry of Labour, of the number of persons insured under the Unemployment Insurance Acts. An examination of this data reveals the fact that 238,660 persons or 26.5 per cent. of the 898,487 persons aged 12 years and over, who were engaged in the industries of the North East Coast in 1921, were employed in the coal mining industry, and that on the average of the five years 1923-1930 (omitting 1925, 1926, and 1928) 224,322 or 32 per cent. of the insured population of the Area were recorded as being attached to the industry. If comparison is confined to the strictly manufacturing industries the predominance of the coal industry is even more pronounced. According to the Census of Production of 1924, 272,000 or 49 per cent. of the 453,800 persons recorded as employed by firms employing more than ten persons on the average on the North East Coast were engaged in the industry in that year.

Next, with regard to the value of the net output of the industry, the figures supplied by the Census of Production show that the value of the net output of all the trades of the North East amounted in 1924 to £85.5 million and of this amount the coal mining industry contributed no less than £38 million or 44.5 per cent. Thus, in brief, it may be said that approximately one-half of the manufacturing population of the Survey Area is engaged in the coal mining industry or that not much less than one-third of the occupied population of the Area is directly connected with the business of coal production. Further, the coal mining industry accounts for 45 per cent. of the value of the physical output of the Area.

3. If the position of the North East is compared with that of the country as a whole, its extreme dependence upon the coal mining industry is at once apparent. At the 1921 Census, 1,305,000 persons were enumerated in the coal mining industry in Great Britain out of a total of 19,369,000 persons engaged in all industries. Thus only 6.7 per cent. of the industrial population of the country was then engaged in the coal mining industry, whereas in the North East district 26.5 per cent. of the total was engaged in the industry. Similarly, according to the 1924 Census of Production only 21.6 per cent. of the strictly manufacturing population of the country was engaged in coal mining, whereas in the North East the proportion amounted to 49.5 per cent. The Unemployment Insurance figures reveal the same situation. Of the 12,138,000 workpeople aged 16-64 estimated to be insured under the Unemployment Insurance Acts in Great Britain at July, 1930, 1,069,000 or 8.8 per cent. were engaged in the coal mining industry while in the North East Area 207,000 persons or 29.5 per cent. of the insured workpeople of the district in that year were attached to coal mining.

4. In view of the great dependence of the Area upon the coal industry it is of first rate importance to consider the present position of the industry in relation to the position which it occupied in the years before the War.

(ii) The pre-war and present position of the Industry.

(a) Production.

5. On the average of the five years 1909-1913, the joint output of the Northumberland and Durham section of the Northern Coalfield amounted to 54 million tons annually or 20 per cent. of the average annual output of the country, while on the average of the five years 1925-1930 (1926 excluded) it amounted to 48 million tons annually or 19.5 per cent. of the country's coal production. Although the North East has thus maintained its position relatively to the rest of the country, yet it is producing on the average six million tons less per annum at the present time than in pre-war years. It is significant that in the meantime the world's annual coal production has increased from 1,078 million tons to 1,229 million tons on the average of these two quinquennia. Thus the North East Area in common with the rest of the country has lost ground absolutely and in relation to the position which it occupied as a world producer of coal in the years before the War.

(b) Exports: Cargo and Bunker.

6. With regard to the export trade in coal the same general situation is revealed. Before the War 21.1 million tons of coal were exported as cargoes to foreign countries from the North East ports of Great Britain. This amount represented 32 per cent. or almost one-third of the total coal exports of the country and, more

significantly, 39 per cent. of the total coal production of the Northumberland and Durham coalfield. It is common knowledge that the Northumberland section of the coalfield is more dependent than that of Durham upon the export trade, but it is not possible to determine from official figures the respective shares of the two counties in the total export trade. In any case the division is not essential for the general view at which this memorandum aims. In the 1925-30 quinquennial period the export trade of the country which the North East has obtained increased to 36 per cent. and is still the equivalent of 38 per cent. of the average annual production of the area, nevertheless it shows an average annual reduction of 2.7 million tons in the quantity of coal shipped to overseas countries.

7. In addition to the exports to overseas countries, the North East ships considerable quantities of bunker coal for the use of ships engaged in the foreign trade. Before the War approximately 3.6 million tons were sent out annually for this purpose. In the more recent five-year period the quantity of coal so exported amounted to 3.4 million tons. The loss of less than a quarter of a million tons in the bunker trade is considerably less important than the loss of almost two and three-quarter million tons in the foreign trade. Taken together the two amount to practically 2 million tons annually as compared with the pre-war period. The explanation of this situation is considered later.

8. The importance of the export market to the coal industry of the Area is indicated by the fact that both before and since the War approximately 40 per cent. of the total production of the coalfield goes into the foreign trade. For the country, as a whole the export trade took 24 per cent. of the total coal raised on the average of the years 1909-1913 and only 21 per cent. on the average of the 1925-30 quinquennium. It follows therefore, that the export trade is much more important to the prosperity of the Northern coalfield than to the prosperity of the coal industry of the country.

(c) *Allocation of the loss.*

9. (1) *Between Export Trade and Home Consumption.*—From this review it would appear that the decline of 6 million tons in the coal output of the Area is accounted for by a reduction of equal amount namely, 3 million tons per annum in the export trade, including in this category, the coal used as bunker by ships engaged in the foreign trade, and in the demand for coal by domestic industries.

10. (2) *By Source, 1913 and 1925-30.*—In view of the importance which a contraction of output has upon the opportunities for employment in the industry, it is perhaps worth while to indicate briefly the principal items which account for the decline. To do so, however, an account of the difficulty in securing statistical data for the five-years period before the War,

necessitates limiting the comparison to the average of the five years 1925-30 (excluding 1926) and the best of the pre-war years, namely 1913.

11. In the first place, the decline in the export trade is accounted for almost entirely by the virtual disappearance of the trade with Russia and by the reduction in the quantity of the coal exported to Germany, Sweden, Norway and Denmark. The contraction in the amount of coal used as bunkers by ships engaged in the foreign trade is attributable in part to the reduction in foreign trade and in part to the use of oil both for steam raising and for internal combustion engines.* On account of the special steam qualities of Northumberland coal, and the greater dependence of Northumberland than Durham upon export markets, it may be assumed that a very large part of the loss of overseas trade has been borne by the former county.

12. In the second place, trade depression in the heavy industries of the Area has resulted in a considerable reduction in their coal consumption. In particular, the decrease in the annual production of pig iron in the North East district from 3.9 million tons in 1913 to 2.1 million tons in the period 1925-30, together with increased economies in the use of coal, is more than enough to account for the loss in local consumption. Indeed, the loss on this account alone, assuming an average coal equivalent consumption of 2 tons per ton of pig iron produced, is likely to have amounted to as much as 3.5 million tons. Since coking coal is produced mainly in Durham, it is certain that the great proportion, if not all of this loss, has been borne by the collieries of that county. Increased use of local coal in the generation of electric power and a fortunate increase in the coastwise shipment of coal, principally to ports south of the Thames, have to some extent offset the reduction in the demand of local industries. Even then, the net loss as has been shown (Paragraph 9) amounts to fully 3 million tons per annum.

(iii) **Employment and Unemployment.**

1. *General.*

13. Another method by which the present position of the coal mining industry can be reviewed is to consider the changes which have taken place during the last few years in the fluctuations in employment. This indeed is, from the point of view of the Industrial Survey, the most important single factor in the enquiry. It must be borne in mind that a reduction in the total numbers of persons employed in the industry, even when it is considerable, cannot by itself be taken as an accurate index of the economic prosperity of the industry. Other factors in addition to the number of persons directly occupied in coal mining must be taken into

* Cf. Report of the Royal Commission on the Coal Industry (1925) Cmd. 2600, p. 13.

account. Nevertheless, within limits, the changes in the number of persons employed in the industry are indicative of the condition of the industry and similarly changes in the position of the industry tend to be reflected in the numbers of persons for whom it provides opportunities for employment.

14. Before going on to review the changes which have taken place in the volume of employment and unemployment, it may be desirable to indicate briefly the general characteristics of the labour demand of the coal mining industry of Northumberland and Durham.

2. Character of the Labour Demand of the Industry.

15. Coal mining is predominantly a male occupation. The Census of 1921 showed that in the Area only 823 females were recorded as engaged in the industry in that year, whereas the number of males so recorded was almost 238,000. Of the 823 females, 374 were engaged in clerical occupations, 138 in domestic work and 241 in production and maintenance. According to the Ministry of Labour Unemployment Insurance statistics, on the average of the five years 1923-30 (excluding 1925, 1926 and 1928) only 400 females were returned among the 224,000 insured workers in the industry. It would appear, therefore, that there has been a very much greater relative decline in the number of women engaged in the industry than in the number of men. In part, no doubt, the explanation is to be found in the displacement of the women who had been recruited to the industry during the War and who still remained in the industry in 1921, but it may be doubted if this is the whole explanation. Table I. shows that the reduction has been continuous over the past eight years and it is difficult to believe that this still represents an exodus of wartime recruits.

TABLE I.—*Number of Persons employed in the Coal Mining Industry 1923-1931.**

Year.	Males.	Females.
1923	232,601	587
1924	231,511	492
1927	174,167	326
1929	180,055	309
1930	160,767	264
1931	125,600	263

*Numbers insured less numbers unemployed.

16. With regard to the male workers, although coal mining requires a very considerable variety of occupations, the great majority of the workpeople are engaged in the hewing or getting of the coal, in conveying materials to the shaft, in making and repairing roads, and in other manual occupations below and above ground. These groups alone account for approximately 198,000 out of the 238,000 male workers in the industry at the Census of 1921. If to that number is added the 10,000 male workers of the superintending staff and the 9,000 male smiths, fitters, electrical engineers and carpenters, 217,000 of the total 238,000 male workers in the coal

industry of the North East Area are included. It is somewhat remarkable that at the 1921 Census, only 17 analytical chemists (16 men and 1 woman) were enumerated in the industry throughout Northumberland, Durham and North Yorkshire.

17. The distribution of the workpeople between operative and administrative staff and between workers above and below ground, is worthy of attention. With regard to the former, in the Census of Production of 1924 only 3,700 were returned in administrative occupations out of a total of 222,000 persons employed in the industry. With regard to the distribution of workpeople above and below ground, no noticeable changes have taken place in the course of the last few years nor, as is shown in Table 2, between the present and the pre-war period.

TABLE 2.—*Number and Percentage of Workers employed below and above ground, in Northumberland and Durham.*
(Annual average).

Period.	Below ground.		Above ground.	
	Number.	Per cent.	Number.	Per cent.
1899-1900 ...	119,800	77·8	34,200	22·2
1909-1913 ...	171,800	80·2	42,400	19·8
*1925-1930 ...	145,800	79·2	38,400	20·8

* Excluding 1926.

During the past thirty years, however, there has been a tendency towards an increasing proportion in the number of workers employed below ground to the total. This is attributable in large part to the fact that in this Area the mines have been worked over a long period of time and coal has now to be obtained at an ever increasing distance from the pit shaft. In consequence the number of workers engaged in the transport of coal along the ways and in the making and repairing of roads has increased relatively to the number of workers employed.

18. Another aspect of the labour demand of the coal industry which calls for brief notice is the demand which it makes for labour of different degrees of skill. Unfortunately, however, the 1921 Census returns do not make it possible to classify the workers in the industry into the three broad groups which are usually distinguished, namely, skilled, semi-skilled and unskilled. All that can be said in this connection is that, if the hewers and getters are regarded as skilled workers, then not much less than 58 per cent. of the total number of coal miners (excluding owners, agents, managers and superintending staff) returned in the 1921 Census, fall within the skilled category. In that year there were 83,000 hewers and getters and to this number must be added about 10,000 smiths, fitters, electrical engineers, carpenters, and other classes of skilled workers.

3. *The course of Employment and Unemployment.*

19. It is important, next, to trace briefly the course of the changes which have taken place in the last six or seven years in the volume of employment and unemployment, and to relate these changes to

the changes which have taken place in the volume of coal production. In this way it may be possible to lay the foundation of a rough estimate of the possible future volume of employment. No attempt can, of course, be made to explain the causes of the variations which have occurred. To do so adequately would necessitate a study of the causes of fluctuation in employment in general, as well as a review of the history of the coal industry and trade throughout the period under review. It will be convenient to consider first the course of employment.

20. (a) *Employment.*—Two sources of statistical information are available by which to measure the changes in the course of employment in the coal mining industry, namely, the statistics of the number of persons employed recorded by the Mines Department and the figures supplied by the working of the Unemployment Insurance scheme. The former are particularly useful since they record the changes in the volume of employment over a much longer period than that covered by the Unemployment Insurance statistics. Moreover, the figures from this source are annual averages, whereas in the other, the figures are those of books exchanged in the month of July in each year, i.e., at a time when colliery working is normally below the average for the year. In the interpretation this limitation of the Unemployment Insurance statistics must constantly be borne in mind. In Table 3 the record from these sources is set out.

TABLE 3.—*Number of Persons employed in the Coal Mining Industry, in Northumberland and Durham.*

Period.	Average No. of persons employed (Mines Dept.).	Index No. 1924=100.	No. of persons employed July in each year.* (Ministry of Labour.)	Index No. 1924=100.
1909-13 Annual Average	000's. 214·2	89·1	000's. —	—
† 1925-30 " "	184·2	76·7	—	—
1913	225·8	94·2	—	—
1923	238·2	99·3	233·2	100·0
1924	239·6	100·0	232·0	100·0
1925	196·5	82·0	—	—
1927	181·3	75·5	174·5	75·2
1928	177·1	73·8	—	—
1929	188·3	78·3	180·4	77·6
1930	177·9	74·1	161·0	69·5
1931	—	—	124·9	54·0

* Numbers insured less numbers unemployed.

† Excluding 1926.

21. There is a close agreement in the movement of the two series of figures despite their different sources of origin. The only significant difference is the apparent greater decline in the numbers employed between 1924 and 1930 as calculated from the Unemployment Insurance figures, than is shown by the Mines Department data. It is almost certain that the difference is due to the exclusion of workers over 64 years of age from the Unemployment Insurance returns after 1927. Broadly speaking, both series show that the coal industry in recent years has afforded opportunities for employment to three-quarters only of the number of persons who were employed in it in 1924. In the period 1925-30 there has been a reduction of 30,000 in the average number of persons employed as compared with the period 1909-1913, and of 55,000 as compared with 1924, the year of maximum recorded employment.

22. (b) *Unemployment.*—The movement in the volume of unemployment in the coal industry of the Area reveals the other side of the situation. An examination of the Unemployment Insurance statistics provided by the Ministry of Labour and set out in the following table shows that in 1923 and 1924 the volume of unemployment in the coal industry was negligible compared with that of other industries.

TABLE 4.—*Unemployment in Coal Mining and All Industries of the North East.*

July of each year.	Coal Industry.		All Industries.	
	Number. (000's).	Per cent.	Number. (000's).	Per cent.
1923	6.1	2.6	113.9	16.3
1924	9.5	3.9	90.3	12.9
1927	51.1	22.6	129.5	18.3
1929	27.6	13.3	100.3	14.5
1930	46.2	22.3	152.5	21.7
1931	75.8	37.8	242.8	34.2

In these years the coal trade accounted for less than one-tenth of the total volume of unemployment in the Area. In 1927 and 1930, however, the coal industry was responsible for about one-third of the total volume of unemployment, and thus contributed its full quota to the unemployment problem of the Area. The temporary revival of 1929 placed the industry in a slightly more favourable position than other industries in that year, but in 1930 and 1931 the position has been reversed.

23. Another aspect of the unemployment position which the Ministry of Labour data make it possible to indicate in a general way is the incidence of unemployment by locality and between men and boys. With regard to the first, it is evident that the scattered nature of the industry makes unemployment much more a problem

in some localities than in others. Most of the coal of the Area is obtained from small communities where the mining of coal is generally the only important industry. In areas where the mines have been long worked, a period of depression in the industry is fraught with grave consequences, for in them whole pits are liable to cease operation. In these communities the general unemployment percentage index for the whole area is an inadequate measure of the incidence of unemployment. Thus, for example, at Bishop Auckland, in 1924, out of a total of 5,500 persons insured in the coal industry, 600 persons or 11 per cent. were recorded as unemployed, while in July, 1930, out of a total of 4,900 insured, no fewer than 3,900 or almost 80 per cent. were recorded as unemployed. Even in a good year like 1929, the numbers unemployed in the coal industry represented 41 per cent. of the numbers attached to the industry in that year. In other centres in West Durham a similar situation exists. In these areas it would appear that the gradual exhaustion of the workable coal* is adding permanently to the burden of unemployment. Again, at Ashington, to take an instance from Northumberland, violent fluctuations in the volume of unemployment have occurred throughout the years under review. Thus in July, 1923 and 1924, there was no unemployment at all among the 12,800 insured mining population in the area. But in July, 1930, no fewer than 7,800 or 76 per cent. of the 10,000 persons insured in the industry in that year were in receipt of Unemployment Benefit. In this case, however, it is probable that this unusually large percentage of unemployment could be explained by some purely local circumstance affecting the conditions of pit working on the date in July of that year on which Unemployment Insurance books were exchanged. In this sub-area there is no problem of exhaustion of workable coal at all parallel to that in the west of Durham.

The social implications of the unequal incidence of unemployment in the industry, even within the Area, can only be appreciated by considering more fully the importance of coal mining to all other forms of industrial activity within each area. In the cases which have been quoted, namely, Bishop Auckland in County Durham, and Ashington in Northumberland, the proportion of persons insured in coal mining to all insured persons under the Unemployment Insurance Acts was 47.4 per cent. and 85.5 per cent. respectively in 1929.

24. With regard to the incidence of unemployment between men and boys it must suffice to state that the percentage of unemployment among boys is year by year considerably less than that among men. In 1927, when the unemployment among men was 23.5 per cent., among boys it was 10.6 per cent., and in 1930, 23.1 per cent. and 10.4 per cent. respectively. But this result is probably

* Cf. Coal Mines Reorganization Commission "Colliery Amalgamations" 1931, page 15.

attributable in large part to the much greater relative reduction in the number of boys attached to the industry than in the number of men between the years 1923 and 1930. Concerning this aspect of the situation something is said in the following section.

25. (c) *The Number of Workpeople Attached to the Industry.*—There is one aspect of the labour supply of the coal industry in the North East Area which is revealed strikingly in the figures provided by the Ministry of Labour, namely, the changes which have taken place in the number of persons attached to the industry throughout the period under review. Table 5 summarizes the situation. The decline in the total numbers attached to the industry between 1924 and 1930 amounts to approximately 35,000. Practically all of this reduction is accounted for by a decline of about 30,000 in the number of men and of almost 5,000 in the number of boys insured in the industry.

TABLE 5.—*Number of Persons Insured in the Coal Industry in the North East Area.*

Year.	Men.	Boys.	Women.	Girls.	Total.	
					Numbers.	Index 1924 = 100.
1923 ...	220,740	17,960	550	50	239,300	99.1
1924 ...	223,870	17,130	450	50	241,500	100.0
1927 ...	211,410	13,880	330	10	225,630	93.4
1929 ...	194,100	13,570	310	10	207,990	86.1
1930 ...	193,880	13,030	270	10	207,190	85.8
1931 ...	188,000	12,390	270	20	200,680	83.0

Between 1924 and 1929 the total decline amounted to approximately 34,000 or only 1,000 fewer than the reduction in the period 1924-1930. The over-all reduction between 1924 and 1930 amounts to 14.2 per cent. but it is made up of a reduction of 13.4 per cent. in the case of men and 23.6 per cent. in the case of boys. The much greater percentage reduction in the number of boys attached to the industry than in the number of men is probably attributable to the policy of restricted recruitment to the industry. These movements have continued into 1931.

26. Some part of the decline in the number of persons attached to the industry is to be accounted for by the exclusion of workers over 64 years of age from the Unemployment Insurance returns after 1927. The effect of this change in classification was to reduce the number of workers recorded in the coal mining industry of Great Britain by 35,000 in 1927. Since practically 20 per cent. of the total number of workers in the coal industry of the country are recorded in Northumberland and Durham, it follows, on the assumption that the age distribution of miners in the Northern coalfield is similar to that of coal workers generally, that the effect of this change was to reduce the figures of the number of workers

insured in Northumberland and Durham by approximately 7,000. Without further information it is impossible to say what proportion of this number continues to be attached to the industry but outside the Unemployment Insurance scheme. It is probable, however, that the reduction in the number of persons attached to the industry is somewhat less than that which Table 5 suggests.

27. (d) *Employment and Production.*—At this point it may be useful to bring together the data concerning production and employment which have previously been examined. In this way it may be possible to glean information which will provide the basis of some rough estimate of the probable employment prospects in the coal industry of the Area in the immediate future. In Table 6, therefore, the average number of persons employed and the tonnage of coal raised according to the Mines Department statistics are tabulated side by side for the year 1913 and for each of the years 1923-1930 (1926 excluded), together with the average annual volume of employment and production for the pre-war and for the most recent quinquennium.

TABLE 6.—*Number of Persons Employed and the Tonnage of Coal Raised, in Northumberland and Durham.*

Period.	Persons Employed.	Tonnage of Coal Raised.	
	000's.	000,000's.	Per Person employed.
1909-13 Annual average ...	214.2	54.4	254
*1925-30 " " ...	184.2	48.3	262
1913	225.8	56.4	250
1923	238.2	52.5	220
1924	239.6	50.4	210
1925	196.5	43.5	221
1927	181.3	48.1	265
1928	177.1	47.7	269
1929	188.3	53.5	284
1930	177.9	49.0	275

* Excluding 1926.

28. It is striking that in 1929 the maximum post-war output for the North East Area, amounting to 53.5 million tons, was obtained with 51,000 fewer workers than in either 1923 or 1924, the post-war years in which coal production came nearest, but appreciably below, the output of 1929. Compared with 1913, the year of maximum output for the Area, the record for 1929 is illuminating. In the former year, 226,000 persons were employed in the production of 56.4 million tons of coal, whereas only 188,000 or 38,000 fewer persons were employed in the production of 53.5 million

tons in the later year. The average output per head increased from 249 tons in 1913 to 284 tons in 1929. Therefore, it is likely that at the 1929 level of productivity per head, an output equal to that of the maximum which the North East has ever attained could be secured by the addition of approximately 10,000 workers to the number employed in 1929. But this would represent 28,000 fewer persons than the number employed in 1913.* Similarly an output equivalent to that of 1924, a good average year, and amounting to 50.4 million tons could probably be obtained at the 1929 level of productivity by 177,000 persons or almost 63,000 fewer than the number actually employed in 1924. It must not be forgotten, of course, that some part of the 1929 productivity is attributable to the increase in the number of hours per day worked by miners in that year. Even at the 1930 level of productivity, namely 275 tons per person employed, the 1924 output could be obtained by 183,000 or still 56,600 fewer than the number employed in 1924, and the maximum output of which the North East has hitherto been capable, namely 56.4 million tons, could in 1930 have been secured by 205,000 or more than 20,000 fewer workers than were employed in 1913.

(iv) **Factors Affecting the Situation.**

1. *General.*

29. The explanations of the changes in the course of production and employment which have been recorded are many and varied. Only a very brief outline of the more important factors in the situation can be undertaken here. Broadly speaking, it may be said that up to 1924 the coal industry of the Area in common with the coal trade of the country,* benefited from the damage to French and Belgian mines, by the dislocation of German economic life during the last stages of currency inflation, and by the occupation of the Ruhr. In consequence, the coal industry in this period drew in additional labour and had a considerably lower percentage of unemployment than industry in general. (Paragraphs 20, 22 and 25 above). Since 1924 the position has been reversed. The restoration of European economic life, the withdrawal from the Ruhr, the return to the gold standard, the domestic trials of 1926, and the effect of Polish competition in the Scandinavian markets have worked together to eliminate the special advantages which the country and the Area enjoyed in the early post-war years. For a time, in 1925 and 1926, the difficulties of the situation were covered up by the operation of a Government subsidy to the coal industry. Since the later year, however, the industry has had to face the problem of readjustment to meet the new conditions, and to add to its difficulties it has had to bear a very considerable part of the burden which has affected

* Cf. H. Clay, "The Problem of Post-War Unemployment," 1929, pp. 41 and 91.

the heavy industries of the country and of the Area, almost continuously from then until the climax of economic and financial uncertainty in the autumn of this year. The general result has been that the volume of employment and production reached a minimum in 1928 and then revived considerably in 1929, only to fall away again in 1930 and almost certainly still more seriously in the present year (1931). In order that the present position and future prospects of the coal industry of the Area may be envisaged it is important to indicate, under one or two broad heads, the specific factors which have operated and continue to influence the condition of the industry.

2. Depression in Local Industries.

30. It has already been shown (Paragraphs 6-12) that on the average of the years 1925-30 almost 40 per cent. of the total coal production of the Area goes into the export trade. The remaining 60 per cent. is therefore consumed within the country, but since a considerable quantity of coal is sent coastwise to ports in the South of England, not all of that proportion can be regarded as being consumed in local industries. It is possible, however, to make an estimate of the amount of coal consumed locally by adding the quantities of coal exported as cargoes and bunkers to the quantities shipped coastwise as cargoes and bunkers to form total shipments of coal from the North East ports, and then subtract this amount from the total coal production of the Area. This has been done in Table 7 for the years 1913 and 1924 and for the average of the years 1909-13 and 1925-30 (1926 ex.).

TABLE 7.—*Distribution of Coal Production.*
(Million Tons.)

<i>Distribution.</i>	1913.	1909-13. (Annual average)	1924.	1925-30.† (Annual average)
<i>Export—</i>				
Cargo	23.0	21.1	21.0	18.3
Bunkers	3.5	3.6	3.4	3.4
<i>Coastwise—</i>				
Cargo	8.0	8.1	7.9	9.8
Bunkers	0.3	0.3	0.3	0.4
Total Shipments ...	34.8	33.1	32.6	31.9
Total Production ...	56.4	54.4	50.4	48.3
Local Consumption* ...	21.6	21.3	17.8	16.4

* Includes some coal sent by rail to districts outside the Area.

† Excluding 1926.

From the quantity of coal consumed locally on this calculation there has to be deducted an amount which is not likely to exceed one million tons per annum to represent the coal carried by rail to districts outside the Area. When this allowance has been made it appears that the local consumption of coal for all purposes has declined from 20.5 million tons approximately per annum before

the War to 15.5 million tons approximately in the 1925-30 period. Compared with 1924 the average annual decline in local consumption amounts to about 1.5 million tons.

31. It is evident that the predicament of the coal industry of the Area in recent years is accounted for largely by the falling off in the local demand for coal. On the assumption that the quantity of coal per head used by domestic consumers in the Area is not much different from the quantity used by domestic consumers generally it may be estimated that between 2.5 million tons and 3 million tons of coal find their way annually into domestic use in the Area. Further, in view of the stability of the annual consumption of domestic coal in the country between 1913 and the present time,* it may be assumed that there has been no considerable change in the domestic coal consumption of the North East Area. It follows, therefore, that the industries of the Area have been consuming 5 million tons less coal annually on the average of the five years 1925-30 than in the five years before the War, and about 1.5 million tons less than in 1924, the best year for employment in the Area in any year since 1923. Even in 1924, however, the coal consumption of local industries was 3.5 million tons below that of the average of the five pre-war years.

32. Unfortunately it is impossible to allocate quantitatively the decline in local consumption industry by industry. In the case of the iron and steel industry some estimate is possible and it has already been shown (Paragraph 12) that practically not less than 3.5 million tons of the decline in the period 1925-30 as compared with the pre-war period is attributable to the decline in the production of pig iron on the North East Coast. Depression in the shipbuilding, engineering and metal industries and in the quantities used at collieries probably account for the remaining 1.5 million tons.

3. *Decline in Export Trade.*

33. The condition of the export trade is the second factor which affects the volume of production and employment in the coal industry of the Area. More coal is exported from the North East Coast ports year by year, to foreign countries than is consumed locally within the Area. (Table 7 above.) Although the decline in the export trade from 21 million tons before the War to 18 million tons in the most recent five-year period represents an appreciably smaller decline than that in the consumption of local industries, it is none the less an important element in the present position of the coal trade. Accordingly, it is necessary to look briefly at the principal sources of loss. To do so, on account of the difficulty in securing statistical information for a five-year period before the War, requires the comparison to be made between the average of the period 1925-30 with 1913, the best of the pre-war years.

* Cmd. 3849 (1931) p. 20.

34. Table 8 shows the quantities of coal exported from the North East Coast ports to principal foreign markets in the years 1913 and 1924-30 (1926 ex.).

TABLE 8.—Exports of Coal from North East Coast Ports to Principal Markets.
(Cargo—million tons.)

Destination.	1925-30									
	1913.	annual average.	1924	1925.	1927.	1928.	1929.	1930.		
Germany	4.7	3.1	4.3	2.7	2.9	3.5	3.4	3.1		
France	3.8	4.2	4.9	3.8	3.8	3.8	5.1	4.7		
Italy	2.7	2.8	2.3	2.7	2.8	2.8	2.9	2.7		
Russia	1.9	—	—	—	—	—	—	—		
Sweden	1.6	1.0	1.5	1.0	1.2	0.8	1.3	0.9		
Denmark	1.3	1.1	1.5	1.3	1.2	0.9	1.0	0.8		
Norway	1.2	1.0	1.3	1.3	1.2	0.8	1.0	0.8		
Belgium	0.7	1.7	1.8	1.2	1.5	1.5	2.3	1.9		
Others	5.1	3.4	3.5	3.0	3.0	3.4	3.7	3.1		
Total Exports	23.0	18.3	21.1	17.0	18.5	17.5	20.7	18.0		

The decline in the export trade in recent years from the 1913 level is accounted for almost entirely by the disappearance of the Russian market and by the reduction in the quantity of coal exported to Germany, Norway, Sweden and Denmark. The extent and explanation of the decline remains to be considered.

35. The greatest single loss in the export coal trade of the North East is the disappearance of the Russian market. In 1913 Russia took about 2 million tons of coal from the Area, but since the War Russia has taken practically no coal from the Area. The explanation is, of course, to be found in the dislocation which has taken place in Russian economic life during the period. It is possible that in the future Russia may again become an important market for our coal, but there is little sign of any immediate prospects of a revival of the Russian coal trade.

36. Next in importance is the average annual loss of one million tons in the trade with the Scandinavian countries of Norway, Sweden and Denmark. The coal imports of these countries have remained unchanged at 10 million tons annually between 1913 and the average of the years 1925-30. Since these countries do not produce coal for themselves, it follows that the North East has been displaced from these markets by competition from other sources. The North East Coast has not been displaced by other British coal producing districts for the decline in the North East coal trade with Scandinavian countries on account of the favourable geographical position of the Area, is much less marked than the decline of the British coal trade as a whole with these countries. There can be no doubt that the chief cause of the decline is Polish competition. The British Coal Delegation to Sweden, Norway and Denmark attributed the success of Polish competition mainly to the relatively low prices of Polish coal, and this is explained in the main by

(1) low costs of production, (2) low rates charged by the Polish State Railways for the transport of coal from the coalfields to the ports of export, (3) low port and loading charges, (4) efficient marketing organization brought about by the concentration of Polish coal production in relatively few hands.* With regard to the second of these points it must be borne in mind that even if there is some State subsidy to Polish export coal shipments this advantage is not nearly sufficient to outweigh the advantage which the North East Coast possesses in the proximity of its coalfields to ports of shipment. The average rate for the transport of coal from the coalfield to the ports of shipment in Poland is about 3s. 4d. or 3s. 5d. per ton, whereas the average rate for the transport of Northumberland and Durham coal to export points does not exceed 1s. 0d. per ton. The North East coal trade, therefore, enjoys a differential advantage in this respect of at least 2s. 4d. per ton. Nevertheless, this is not sufficient to compensate for the difference of about 4s. per ton which exists between the costs of production in Northumberland and Poland.† To some extent also Polish competition has been strengthened by weaknesses in the British coal position, due to a number of factors, of which the most important are (1) an undue proportion of smalls in British cargoes, (2) defective cleaning and grading, and (3) excessive breakage and delays in loading at docks.‡

37. The decline in the volume of trade with Germany is less than appears at first sight. Luxemburg was included in Germany in 1913 but is included with Belgium in the post-war years. If the exports to these two countries are taken together, however, there is a decline of more than half-a-million tons per annum in recent years as compared with 1913. Most of the reduction is almost certainly in the trade with Germany and is mainly due to the increased production of lignite in that country.§

38. In the Far East, the North East Coast has to meet the competition of Japan and South Africa, while in South America and in the Mediterranean, American competition is considerable, especially in years of good prices.

4. *Coastwise Trade.*

39. The decline of 5 million tons per annum in local coal consumption and of 3 million tons in the export trade has been compensated to the extent of almost 2 million tons by an increase in the quantity of coal shipped coastwise as cargo, to the South of England, mainly for domestic and gas making purposes. It has been suggested that the increased coastwise shipments from North

* Cmd. 3702 (1930).

† *Ib.* p. 5.

‡ *Ib.* p. 6.

§ Cf. Report of the Royal Commission on the Coal Industry, Cmd. 2600, p. 6.

Eastern ports is to be attributed to changes in the system of railway rates, which by transferring the transport of coal from the railways to the coastwise trade has had the effect of strengthening the position of the Northern coalfield in competition with South Yorkshire for southern markets. To some extent it may also be due to a greater reduction in seaborne freight rates than in railway rates.

5. *Other Factors.*

40. In addition to the depression in local industries and changes in the direction and volume of coal shipments, numerous other factors have exercised some influence upon the present position of the industry. The most important of these have been the substitution of oil fuel for steam raising and its application to internal combustion engines; the stationary consumption of domestic coal in spite of increasing population, and of coal for the production of gas in spite of a greatly increased consumption of gas. No quantitative estimate of the effect of these factors can be given. In any case their significance is limited, for while they may explain in part a failure of coal production to increase they do not explain the fact of greatly decreased coal production. Again, the introduction of mechanical devices for the extraction of coal, and improvements in organization and marketing have not been without considerable influence upon the volume of employment in the industry. Nevertheless, this result is best regarded as the immediate, and may be only temporary, effect of the methods which the industry has adopted to increase its efficiency and lower production costs in order to meet the situation in which it has found itself as a result of economies in the use of coal, depression in local industries and the pressure of foreign competition in overseas markets, rather than as an ultimate cause of the post-war problems of the industry. Further, in the course of the last months of the present year, the international financial crisis and the suspension of the gold standard have reacted upon the position of the industry. Opinion upon the effect of these developments varies. On the whole the effect has been unfavourable. The crisis, by dislocating international trade, has undoubtedly worsened the position of the industry, while the favourable influence of the abandonment of the gold standard in operating as stimulus to the export trade has been offset by uncertainties in foreign exchanges, by losses in contracts concluded in terms of foreign currencies, by the suspension of the gold standard in some countries, especially in Scandinavia, and by the imposition of special imposts in others, particularly in France.

(v.) *Measures Adopted by the Industry to meet the Situation.*

1.—*General.*

41. In an endeavour to meet the difficulties which have confronted it in recent years, the coal industry of the Area has been compelled to effect reductions in the terms which it offers to

workpeople in order that it might continue to maintain its place as a centre of coal production. The effect of this change is largely reflected in the reduction in wages costs of production which have taken place in the course of the last six years. But it has also had resort to a variety of practices designed to increase the efficiency of its working and it is to a brief consideration of these devices that we must now proceed. Of these the most important have been the concentration of production in fewer pits, improvements in technical equipment, the mechanization of coal getting, reorganization through amalgamations and marketing devices, and the extension of research. The application of some of these measures has undoubtedly had the effect of reducing considerably the number of workpeople required for any given volume of output, but it is advisable to postpone the consideration of this aspect of the position until later. (Paragraphs 67 and 68.)

2. Concentration of Production.

42. A feature of recent changes in the structure of the coal-mining industry in the North East has been the gradual concentration of production in fewer and fewer pits. The data given in Table 9 are indicative of the movement in this direction.

TABLE 9.—*Output per Pit in Northumberland and Durham, 1913 and 1923-30.*

Year.	Number of Mines at Work.	Output per Mine. (000 Tons).
1913	433	130
1923	412	127
1924	418	121
1925	379	115
1927	401	120
1928	271	129
1929	368	145
1930	345	142

Since 1924 there has been a steady and nearly continuous reduction in the number of mines at work within the Area even in years in which the output of coal has increased. It will be observed that although the number of pits in operation has declined almost continuously from 1924, the output per pit declined until 1925 and then began to increase steadily until 1929, when the output per pit amounted to 145,000 tons or as much above the 1913 level of 130,000 tons per pit as it had been below it in 1925. It would thus appear that the tendency has been toward the elimination of the poorer and less efficient pits and the concentration of production in the richer and more efficient pits.

43. The reduction in the number of pits at work is of course the net result of the closing of some pits and the opening of others. The Returns supplied by the local Employment Exchanges and Branch Offices of the Ministry of Labour on this movement, show that 46 pits have ceased operation since 1920 and that 9 have opened in the same period. The net reduction is therefore 35 pits.

The Mines Department figures, however, show a reduction of 48 in the number of pits at work over this period. Despite the disparity in these figures, for which doubtless there is some explanation, an examination of the returns supplied by the Ministry of Labour is interesting, and shows the following results :—

TABLE 10.—*Analysis of Pits Closed, 1920-30.*

<i>Reason for Closing.</i>	<i>Number of Pits.</i>	<i>Number of Employees.</i>
Worked out and dismantled	14	3,069
" Closed down "	11	3,446
Liquidation	5	1,550
" Depression "	6	3,690
Temporarily stopped	7	4,260
Others	3	890
	46	16,905

The 46 pits which have been closed account for the displacement of almost 17,000 workpeople, while the 9 new pits are estimated to employ about 1,200 persons at the present time. Of the new pits the Vane-Tempest Colliery of the Londonderry Coal Company, Limited, at Seaham Harbour, accounts for 850 persons, or more than two-thirds of the total.

3. *Technical Equipment.*

44. Perhaps the most prominent feature of coal mining practice in the North East in recent years has been the movement toward an increase in the use of mechanical and electrical equipment in the mining and conveying of coal. In these respects marked progress has been made in the course of the last six years, and more strikingly since the years before the War. On account of the difference in the extent to which mechanical methods have been applied in Northumberland and Durham it is necessary to consider these counties separately.

45. (a) *Coal-Cutting Machinery.*—In Northumberland not much more than 10 per cent. of the total coal output of the county was obtained by machines before the War, but, by 1924, 3.9 million tons of the 13.7 million tons produced, or 28 per cent., was cut by machines and by 1930 the quantity so obtained had increased to 8.5 million tons, or 64 per cent. of the total output of 13.1 million tons in that year. The total number of coal-cutting machines installed has increased from 594 in 1924 to 787 in 1930, and the number of mines at which machines were installed has increased from 47 to 61 in this period. In 1930, 61 of the 103 mines at work had coal-cutting machines in use. In view of the steady increase in the use of coal-cutting machinery in the county and of the fact that there still remains a considerable number of mines at which machines have not yet been installed, it seems likely that the movement will

continue. Although the percentage of coal cut by machines in Northumberland is twice as great as the percentage (31.0 in 1930) cut by machines in the country as a whole, it is still below the percentage cut by machines in Scotland, where it was 66 per cent. in 1930, and much below the Lanarkshire section of the Scottish coalfield, where it was 74 per cent. in that year.

46. In Durham, although more coal has been cut by machines than in Northumberland throughout the whole period under review, yet the percentage of the total output so obtained is very much less than in the case of Northumberland. Moreover the rate of increase has been very much lower. At the outbreak of the War only 4 per cent. of the total coal production of the county was cut by machines. By 1924 the production had increased to 16 per cent., i.e., 5.7 million tons out of a total of 36.7 million tons, and by 1930 to 26 per cent., i.e., 9.2 million tons out of a total of 35.8 million tons. The total number of machines in use in Durham has increased, but only from 1,142 in 1924 to 1,421 in 1930, and the number of mines at which these machines were in use has fallen from 110 to 100 in this period. In 1930, coal-cutting machines were installed at 100 out of the 242 mines at work in the county in that year. It seems evident that there is much room for an extension in the use of coal-cutting machinery in this section of the Northern coalfield. In Durham, the percentage of coal cut by machines is 5 per cent. less than the percentage of coal cut by machines in Great Britain as a whole.

47. Another development in the use of mechanical devices in the getting of coal has been the introduction of pneumatic picks and drills. In 1928, 140 of the 934 light pneumatic picks used for coal getting and 1,464 of the 5,504 pneumatic drills used for boring shot holes in Great Britain were in use in the Northern coalfield. An extension in the use of these implements is probable for in the principal coalfields of France and Belgium 50 to 70 per cent. of the coal is obtained by the use of mechanical picks and in the Ruhr coalfield the output obtained by their use amounts to 75 per cent.*

48. (b) *Conveyors used below Ground.*—Closely connected with the use of coal-cutting machinery is the introduction of mechanical appliances for conveying coal along the coal face and elsewhere underground in the mines of the Area. In this respect the industry in the Area has not kept pace with developments in the country generally. But again in this case, as might be expected, there is a marked difference in the extent to which conveyors have been introduced and are being used in the pits of Northumberland and Durham.

49. In Northumberland in 1930, 2.5 million tons or 19.1 per cent. of the total output was carried by conveyors underground, while in

* Annual Report of the Secretary for Mines, 1927, p. 7.

Durham 2.6 million tons or only 7.3 per cent. was conveyed in this manner. Taking the counties together 5.1 million tons, or 10.4 per cent. of the coal production was conveyed as compared with 42.5 million tons, or 17.4 per cent. of the production of the country conveyed in this way in 1930. The system of working the coal may explain the difference.

50. (c) *Electrical Equipment*.—In 1930, electrical equipment was installed at 70 of the 103 collieries at work in Northumberland and at 155 of the 242 collieries at work in Durham, the average horse-power per person employed was 2.25 in Northumberland and 2.1 in Durham. In both counties the average horse-power per person employed was slightly above the average for Great Britain.

51. (d) *Coal Washing or Cleaning Plants*.—A development of recent years has been the increase in the quantities of coal washed or cleaned before sale in the two counties. Although the total quantity and the percentage of coal treated in this way has shown a steady increase between 1927, the first year in which statistical information is available, and 1930, yet in this respect both Northumberland and Durham show signs of lagging behind the rate of progress in Great Britain. In Great Britain in 1930, 29.8 per cent. of the total coal output was washed or cleaned, whereas in Durham the proportion so treated was 23.2 per cent., while in Northumberland it was only 14.5 per cent. On the other hand, it must be observed that in the dry-cleaning of coal, Northumberland and Durham appear to be taking the lead. In Great Britain in 1930, 6.3 million tons or 8.7 per cent. of the 72.7 million tons of coal washed or cleaned was treated at dry-cleaning plants, while in Durham 2.8 million tons, or 33.7 per cent. of the 8.3 million tons treated was dry-cleaned, and in Northumberland 0.8 million tons, or 42.1 per cent. of the 1.9 million tons washed or cleaned was dry-cleaned. It appears that almost all the new plants installed at the collieries of Northumberland and Durham for the purpose are dry-cleaning plants. In view of the importance of the export trade to the coalfields of the North East, and of the prevalence of complaints by foreign customers, especially in Scandinavia,* about the percentage of moisture in washed coal, the movement toward an extension in the use of dry-cleaning plants is definitely in the right direction.

52. (e) *Summary*.—On the whole it would appear that the rate of advance in the application of new technical methods in the mining of coal in the North East section of the Northern coalfield has been greater than that in the country as a whole. The proportion of coal cut by machines in the counties of Northumberland and Durham taken together, amounted to 36.2 per cent. in 1930, as against 31 per cent. in Great Britain. But this over-all percentage hides a marked difference in the extent to which mechanical methods of

* Cf. Report of British Coal Delegation to Sweden, Norway and Denmark, Cmd. 3702. (1930.)

coal getting have been developed in the two counties. Durham appears to be lagging in this respect, and since there is no very obvious technical, physical, or geological explanation of this fact, a considerable extension in the application of machine methods of coal getting is to be expected within the next few years. Easier conditions in mining in Durham than in Northumberland may explain the difference which exists between the two counties, but this advantage does not absolve the industry in Durham from the necessity of exploring every avenue by which costs of production are likely to be decreased. It is not by chance that in recent years the output of saleable coal per person employed and the profit per ton of coal commercially disposable has been greater in Northumberland than in Durham.*

53. With regard to the washing and cleaning of coal both counties have made less progress than the rest of the country and very much less progress than Scotland, where 45.6 per cent. of the total coal output is washed or cleaned. On the other hand it appears that dry-cleaning is the process now most in favour and in this method of treating coal the collieries of Northumberland and Durham have definitely taken the lead.

4. Reorganization.

54. (a) *Amalgamation and Grouping of Collieries.*—Reorganization through amalgamations and large scale groupings of independent companies has long been urged upon the coal mining industry as one of the principal methods by which its efficiency might be increased and its competitive position against other coal producing countries and competing products greatly strengthened. Hitherto, however, surprisingly little movement has taken place in this direction and in this respect the coal industry of Northumberland and Durham is no exception. In 1930, the coal output of Northumberland, amounting to 13 million tons, was produced by no fewer than 56 undertakings, and the coal output of Durham, amounting to 36 million tons in that year, was produced by 97 undertakings.† In the former county 52 per cent. of the output is controlled by four undertakings and in the latter county 52 per cent. of the output is in the hands of seven undertakings. There have, of course, been some amalgamations among concerns in Northumberland in the course of the last few years. Thus the Mickley, Acomb, Cowpen, Burradon and Coxlodge, and Highfield Coal Companies have come together, and the Seaton Delaval and Cramlington Coal Companies have amalgamated to form the Hartley Main Collieries Limited. But this grouping has done little to bring into existence the large undertakings which were recommended by the Royal Commission on the Coal Industry (1925) and for the encouragement

* Coal Mines Reorganization Commission, "Colliery Amalgamations," 1931, p. 15.

† *Ib.* pp. 14 and 15.

of which the Coal Mines Reorganization Commission was set up under Part 11 of the Coal Mines Act, 1930. In Durham, apart from amalgamations which have come about through combinations in the iron and steel industry, no step in this direction has been taken since the grouping of the Lambton, Hetton and Joicey Collieries.

55. It is not possible in this memorandum to examine in detail all the possible explanations which might be advanced for this situation. In brief, it appears that neither the recommendations of the Royal Commission, nor the advice of the Coal Mines Reorganization Commission, have convinced the colliery owners of the North East of the advantages to themselves and the industry to be obtained from amalgamations on a scale sufficiently large to make possible greater unity of control over coal production in the Area. Difficulties in the valuation of coal properties and plants, personal interests, and, probably most important of all, doubt concerning the truth of the generalization that large undertakings operate more efficiently than small ones,* go far to explain the reluctance of colliery owners in the Area to move in the direction of the ideal proposed by the Coal Mines Reorganization Commission, namely, one undertaking for Northumberland and several very large concerns for Durham. To these difficulties have to be added great practical difficulties in applying the policy of large scale grouping. It is possible, of course, that the Coal Mines Reorganization Commission in the meantime may succeed in overcoming these obstacles and in promoting the large units in which it puts its trust. There is no evidence that the North East Coast Area is exceptional in its reluctance to move toward greater unity of control by the creation of very large coal undertakings.

56. (b) *Co-operation through Trade Associations.*—In addition to combinations of a permanent type, colliery owners and their representatives have for long been accustomed in both counties to discuss labour questions and general problems affecting the industry through trade associations. The Northumberland Coal Owners' Association and the Durham Coal Owners' Association have a joint office with a joint secretary and staff in Newcastle-upon-Tyne, where regular meetings are held. For parliamentary purposes many members of these associations are united through the North of England United Coal Trade Association. Apart from this form of co-operation in matters affecting the interests of the coal trade in Parliament these associations remain separate.

57. (c) *Marketing.*—According to the Royal Commission on the Coal Industry (1925) one of the weakest aspects of the organization of the industry was to be found in the methods of marketing coal to consumers, and it urged upon the industry the advantages to be obtained through co-operative marketing of coal.

* Cf. R. W. Dron, "The Economics of Coal Mining," 1928, Ch. VIII.

This recommendation received further support in the Report of the Committee on Co-operative Selling in the Coal Mining Industry (1926) and shortly afterwards the colliery owners of the Area began to consider the possibilities in this direction, but the passing of the Coal Mines Act (1930) made the adoption of uniform marketing arrangements compulsory.

58. It is unnecessary to review the scheme which Part 1 of that Act has compelled the industry to adopt and administer. It would be more important to try to discover the effects which the scheme has had upon the position of the industry since it came into operation at the beginning of the year (1931). To do so adequately, however, is impossible here on account of (1) the size and difficulty of the task, and (2) the complexity of the present situation. It must suffice to note (1) that during the March quarter of the year (1931) the output of coal in Northumberland exceeded slightly the quota of the county and that in consequence it had to pay a penalty amounting to £3,500 to the Central Council.* (2) Complaints are frequently expressed about the effect of the scheme in restricting the output of coal in the county and in restricting the shipment of coal from the Tyne. (3) While during the March quarter of this year the output of coal in Durham was considerably less than the permitted output, the Durham coal owners allege that the operation of minimum prices in the county before the fixing of minimum prices in other districts, and particularly in the Midlands and Scotland, made it possible for these other districts to undersell Durham in local markets. Subsequently, however, the Northumberland, Durham and Midland Districts worked out a schedule of shipment prices for the Midland Districts, which on the whole proved acceptable to the North East Coast owners.† (4) It is a common complaint that the fixing of minimum prices has strengthened the position of foreign coal producing countries, particularly Poland, in competitive markets. (5) Fundamentally the scheme is one of restriction of output.

5. Research.

59. In the course of the past few years, research into various geological, physical, chemical and technical problems of the industry has been carried out on the North East Coast. Broadly speaking the purpose of these investigations has been (1) to supply the detailed information which is essential not only for the successful and scientific exploitation of our coal resources but also "to ascertain the methods of cleaning, grading and blending best suited to the different seams, due regard being paid to the purposes for which the coal is to be used,"‡ (2) to make possible the develop-

* Cmd. 3905 (1931), pp. 4-6.

† *Ib.* p. 4 and p. 7 and pp. 10-11.

‡ Report of Fuel Research Board, 1929, p. 8.

ment of new and improved methods of utilisation, (3) to improve the technique of coal mining and (4) to make the mining of coal a less hazardous occupation than it is at present. The briefest of statements concerning the nature of the work is all that can be attempted in this memorandum.

60. (a) *Occurrence and Constitution. Physical and Chemical Survey of the Coal Resources.*—Under the direction of a committee set up by the Fuel Research Board and representative of colliery owners, managers, engineers, the Geological Survey and of scientific interests, a series of investigations into the physical and chemical characteristics of various coal seams in Northumberland and Durham has been carried out at the local Coal Survey Laboratory in Armstrong College, at Newcastle, and a series of reports prepared.*

61. (b) *Utilisation. (1) Low Temperature Carbonisation.*—In 1929 the Fuel Research Board carried out tests at the "Babcock" low temperature carbonisation plant installed at the Dunston Electricity Works of the Newcastle-upon-Tyne Electric Supply Company, Limited, as well as at other centres throughout the country. According to the Board, however, while considerable progress has been made in the commercial development of low temperature carbonisation it is still too early to say whether low temperature carbonisation of coal will prove an economic success on a really large scale, or to say which of the various processes are most likely to prove successful.†

62. (2) *Hydrogenation.*—Investigations into the production of oil fuel by the hydrogenation of bituminous coal have been carried out by Imperial Chemical Industries Limited, at Billingham, Middlesbrough. On the basis of recent investigations it is claimed that a plant costing £8,000,000 and producing 60 million gallons of motor spirit per annum, could produce a spirit at 7d. a gallon. Even at this cost and on the assumption that the production of oil fuel by this process is protected from foreign competition to the extent of the present duty of 6d. per gallon on imported spirit, the oil produced by this process would be unable to compete with imported oil. It does not seem probable, therefore, that this process will be sufficiently developed to have any important influence on the demand for coal for purposes of oil fuel production in the near future.

63. (3) *Metallurgical Coke.*—Under the direction of the local Coke Research Committee set up about five years ago at the suggestion of the National Federation of Iron and Steel Manufacturers, a series of investigations into the chemical and physical characteristics of various cokes has been carried out in the laboratories of Armstrong College. The purpose of these investigations is to discover on the one hand the most desirable properties of coke, and on the

* *Ib.* 1929 and 1930.

† *Ib.* 1929, p. 7.

other hand to obtain these properties when they are known. In view of the necessity of a supply of suitable coke to the iron and steel industry of the North East Coast and of the threatened exhaustion of the coking coals of West Durham, the importance of these investigations needs no emphasis. Another branch of the committee's work has to do with the construction of coke ovens. Important modifications in the structure of coke ovens have been suggested as a result of the committee's investigations. The Coke Research Committee now forms part of the organization of the Industrial Research Council recently formed by the National Federation of Iron and Steel Manufacturers.*

64. (c) *Coal-Winning*.—Experimental work in regard to the winning of coal is being extensively carried out in the North East Area. Most of the progressive collieries of the Area, especially the newer collieries along the coast in Durham, are prosecuting investigations into various aspects of coal winning and their work in this connection is supplemented by investigations undertaken by special committees of the North of England Institute of Mining and Mechanical Engineers, and by the Mining Department at Armstrong College. Attention is directed in the main to new methods of production, concentration of output and haulage, methods of support of roof and sides, prevention of subsidence, ventilation, coal-cleaning, and geo-physical surveying. From time to time reports are also made by local investigators into certain aspects of mining practice in other coal-producing countries.

65. (d) *Safety and Health*.—Similarly, important research work is being carried out in the Area with the object of increasing safety in the mines and reducing the incidence of industrial diseases among miners. This aspect of research work is undertaken by a number of agencies including the collieries, the Institute of Mining and Mechanical Engineers, Armstrong College and the Medical College in Newcastle-upon-Tyne, and by the Safety in Mines Research Board.

66. *Summary*.—It is not possible to make any estimate of the amount of research work which is being carried out into the problems of the coal industry in the Area as compared with the amount which is being done in other centres of coal production, nor is it possible to say what measure of support is being given by the industry itself to work of this character. The preceding summary indicates, however, that there are a considerable number of owners in the Area who are aware of the importance of research and that no important aspect of mining practice appears to have been overlooked. Nevertheless, it is worthy of note that in 1926 the Royal Commission on the Coal Industry was of the opinion that the industry's attitude toward research indicated an insufficient appreciation of the importance of the question,† and scientific

* *Ib.* 1929 and 1930.

† Report, p. 40.

workers in the Area are definitely of the opinion that much more could be accomplished by the industry in the development of research work through the establishment of co-operative research on a large scale.

6. *Consequences.*

67. It is difficult to frame any statistical estimate of the effect which the adoption by the coal mining industry of the measures which have been reviewed concerning the concentration of production, mechanization of coal getting, reorganization and research, have exercised and are likely to exercise upon the employment capacity of the industry. Viewed broadly these measures have been applied in order to maintain the industry in a condition in which it can compete successfully with newer sources of coal production overseas and with new competitive fuels. Nevertheless, there is little doubt that the immediate consequence of some of them has been to reduce the number of persons who need be employed in the production of a given quantity of coal. This is particularly true of the concentration of coal production and the introduction of new machine methods in the mining of coal.

68. It has been shown (Paragraph 28) that at the 1929 level of productivity the 1913 level of output could probably be attained at the present time by just less than 200,000 workpeople. Since the number of hours worked per shift were the same in 1929 as in 1913, namely 8 hours, it follows that the immediate consequence of the adoption of improved methods of the industry has been to displace something between 25,000 and 28,000 workpeople. Compared with 1924, the difference is even more striking. The output of 1924 could be secured at the 1929 level of productivity by some 63,000 fewer workpeople and at the 1930 level of productivity by 56,000 fewer workpeople than the number employed in 1924. In this case, however, allowance must be made for the increase in the number of hours worked per shift from $7\frac{1}{2}$ in 1924 to 8 in 1929 and 1930. Even then, however, the effect of improved methods would have been to displace 59,000 at the 1929 level of productivity and 52,000 at that of 1930. The possibilities for the re-absorption of any considerable number of the displaced workers depends, apart from changes in the hours of work, upon a greatly increased output of coal in the Area in the next few years. Therefore, before any estimate of the future labour requirements of the industry can be estimated, some attempt must be made to indicate the prospects of the coal industry of the Area for the next few years.

(vi) **Prospects of the Industry.**

1. *General.*

69. The immediate prospects of the coal trade on the North East Coast as in other centres of coal production at home and abroad, depend broadly upon the conditions of demand and supply for coal

in the near future. On the side of supply the principal factors are the resources of the Area including under this term the skill of its workpeople and the efficiency of the industry's organization and technique of production in relation to those of other centres of production and to competitive fuels, or in other words, on comparative costs of production. On the side of demand the most important factors are the revival of local industrial activity, an increase in the volume of trade with countries overseas, and the development of new uses for coal. To elaborate each of these aspects of the problem of the coal industry is beyond the range of this memorandum, but a brief indication of the present position in regard to each of them is attempted in the following section.

2. Conditions Affecting Supply.

70. (a) *Coal Resources*.—It is estimated that the area of the main coalfield in Northumberland and Durham, extending over approximately 200 square miles, contains about 10,000 million tons of workable coal of which about one-fifth lies underneath the sea.* At the present rate of production of about 50 million tons per annum and on the assumption that no more than half of the estimated workable reserves is extracted, there is coal enough to last for a century. On the other hand coal in this area has been continuously mined over several generations and as is shown in Table II more of the coal is obtained from thin seams in both Northumberland and Durham than in Great Britain as a whole. This disadvantage is offset, however, by lower costs of production.

TABLE II.—Percentage of Coal Raised according to Thickness of Coal Filled out, 1924.†

Average Thickness of coal filled out.	Northumberland.	Durham.	Great Britain.
Under 36 inches	40·5	29·6	22·2
36 inches to 66 inches	54·0	61·7	60·9
66 inches and over	5·5	8·7	16·9

71. (b) *Effectiveness of Readjustments*.—There can be little doubt from the previous review that the coal industry of the Area has on the whole brought about the adjustments which were required to enable it to meet the conditions which confronted it in the difficult years between 1924 and 1927.

Thus in every year since 1924 wages costs and total costs per ton of coal commercially disposable have been less in Northumberland and Durham than in Great Britain.‡ In 1927 they were below those of any of the other principal coal producing countries except Poland and the Ruhr district of Germany, and it is probable

* Cf. Coal Mines Reorganization Commission "Colliery Amalgamations" p. 13.

† Royal Commission on the Coal Industry (1925) Appendix, pp. 184-185.

‡ Statistical Tables relating to British and Foreign Trade and Industry, Part II. Cmd. 3849.

that this position has been maintained since that year. Similarly "other costs" have been continuously lowered since 1924, and in 1929 and 1930, for the first time since 1924, the industry in the Area has been able to show a profit per ton of coal commercially disposable. At the same time the fall in coal prices has been greater year by year than the fall in wholesale prices.* The process of readjustment has been a severe one and there can be little doubt that it has pressed hardly upon coal miners and their families in the Area. It cannot but be a matter of regret that the advantages which might normally have been expected from so great sacrifices and from the expenditure of so much energy and ability in increasing technical efficiency should have been denied the industry by the industrial and financial crisis of 1931. It is some solace to know that the industry is now in a position to meet efficiently and cheaply both the domestic and foreign demand for coal which is certain to re-appear when these difficult days are over.

3. Conditions Affecting Demand.

72. (a) *Local Industries*.—It has been shown that the principal factor affecting the position of the coal industry during the past five or six years has been the reduction in the demand for coal by local industries. It follows, therefore, that the prospects of the coal industry depend largely upon the revival of the industrial demand for coal. In the following paragraph the possibilities in this respect are reviewed.

73. *Iron and Steel Industry*.—Resumption of activity in the iron and steel trades will have an immediate influence upon the demand for coking coal and so upon the opportunities for employment in the Area, particularly in this case, in the county of Durham. There is little possibility, however, of a return to the level of production of pig iron which prevailed in 1913, therefore the loss on this account must be regarded as permanent. On the other hand there is reason to believe that the output of the blast-furnaces of the Area will be as great in the future as in the last five or six years.

74. It was hoped to be able to include a brief statement at this point of the possible future demand for coal on the part of each of the other important manufacturing industries of the Area. Unfortunately it has not been possible to do so in the time available.

75. (b) *Foreign Trade*.—The probability of an early revival of the foreign coal trade of the North East does not at present appear very great. The increased competitive strength of foreign producers, particularly of Poland, presses hardly upon the position of the North East Coast in competitive European markets. Restrictions on the importation of coal from Great Britain have made impossible in the meantime any extension in the coal trade with France. Low production costs in the Ruhr and Upper Silesia set limits to the

* *Ib.* Part I, Cmd. 3737, pp. 254-255.

extent of the North East's markets in Germany, and political and other difficulties obstruct the way to a revival of trade with Russia. It is unlikely, therefore, that the extent of the export trade of the North East with foreign countries will exceed in the next five years or so the amount of its trade with them in the past quinquennium. An increase in the volume of world trade, on the other hand, would help a little to add to the coal shipments of the Area.

76. (c) *Coastwise Trade and the Development of the South.*—There is no apparent reason at present why the North East Coast should not continue to retain the position which it has attained in the coal markets of the South. If, as seems likely, the industrial development of the South of England continues as rapidly in the future as it has done in the years since the end of the War the market which it provides for coal may well be one of growing importance for the coal trade of this Area. In view of the competition which the North East has to meet from other coal-producing districts within the country, particularly from the new Kent coalfield and the coalfields of the Midlands and South Wales, it would be unduly optimistic to assume that the volume of trade with the South will exceed the level of 11 million tons which it attained in 1929 and 1930.

77. (d) *New Uses for Coal and Competitive Fuels.*—Considerable advance has undoubtedly been made in the course of the past few years in the development of new uses and new methods in the treatment of coal, but so far there is no immediate sign of the large scale development of new methods which would be necessary in order to result in any material increase in the production of coal from the North East Area. While it is no doubt true that some concerns have been able, for example, to produce sufficient oil fuel for their own consumption by the treatment of coal by one process or another, they have been enabled to do so only by the existence of a considerable duty upon imported oil fuels. Further, it must not be overlooked that methods are constantly being explored by which the efficiency of the fuels which are in competition with coal and of the fuels which depend upon coal can be increased.

78. (e) *Prospects in the Near Future.*—The role of prophet is a difficult one, but when all the factors affecting the supply and demand for coal are reviewed, it does not seem probable that the average annual production of coal in the North East in the next five years will differ greatly from the annual average of the last five-year period. An average annual production in the region of 50 million tons (the output of 1924) is, therefore, to be expected, and this will represent an improvement on the annual average output of the period 1925-30. A return to the average annual output before the War (1909-13), namely, 54 million tons, is certainly the utmost that can be reasonably expected. On this basis, therefore, it is possible to make an estimate of the future probable labour requirements of the coal industry of this Area.

(vii) **Future Labour Requirements and the Surplus.***1. The Numbers likely to be Required.*

79. At the 1930 level of productivity, namely, 275 tons of coal raised per person employed, an output of 50 million tons could be obtained by 182,000 persons on the average, while at the 1929 level of productivity, namely, 284 tons per person, only 176,000 persons would be required. To the numbers arrived at on each of these assumptions there has to be added an allowance for the reduction in the length of the working day from 8 hours in 1929 and 1930, to $7\frac{1}{2}$ hours in the present year. When this has been made, the numbers are increased to 194,000 and 188,000 respectively. These figures, therefore, indicate, approximately, the number for whom continuous employment is to be expected on this purely arithmetical calculation in the course of the next few years.

80. On the more favourable assumption that the output of the next five years will be as good as that of the five years before the War and of the year 1929, namely, 54 million tons, per annum, the numbers required on a $7\frac{1}{2}$ hours day at the 1930 level of productivity would have to be increased to 209,000, and on the 1929 level of productivity to 203,000. The mean of 194,000 and 209,000 is about 200,000, and it is almost certain that this is the maximum number of persons who are likely to be employed in the coal industry of the North East in any year in the near future.

2. The Surplus.

81. It has been shown that the number of persons insured in the industry in the Area had been reduced to just over 200,000 in 1931. It would appear, therefore, that the point is now being approached at which no considerable reduction in the numbers attached to the industry is to be expected. Indeed, assuming that the average annual output in the next five years will amount to 50 million tons and that this output will be obtained by 188,000 persons, then the number of persons, who would be unemployed on the average in these years, would be only 12,000, or 6 per cent. of those attached to the industry at the present time. If the numbers attached to the industry show no further decline below the present level of 200,000 persons, this will represent a reduction of fully 40,000 on the numbers who were attached to the industry in 1924.

82. In conclusion, therefore, it would be unwise, having regard both to the prospects of the industry and to the numbers at present attached to the industry, to say that there is any considerable surplus of labour in the coal industry at the present time. On the other hand, however, if the workpeople who secured employment in the industry in 1924, but who have ceased to be insured in the industry since that year, have not been absorbed into other industries within the Area or transferred to industries outside the Area.

and are therefore, still unemployed within the Survey Area, then the surplus of workpeople available to the coal industry must be fully 40,000 persons.

V.—THE IRON AND STEEL INDUSTRY.

(*Memorandum by Mr. E. D. McCallum.*)

(i) Introductory—Importance of the Industry.

1. The iron and steel industry of the North East Coast ranks considerably below several other industries in importance in the industrial economy of the Area. At the 1921 Census it employed in its heavy branches, i.e., blast-furnaces, steel works and rolling mills, only 46,194 persons or 5.2 per cent. of the 898,487 persons who were recorded in the industries of the Area in that year, and on the average of the five years 1923-30 (excluding 1925, 1926 and 1928) 39,000 persons or 5.6 per cent. of the average number of 700,000 persons insured under the Unemployment Insurance scheme in all industries of the district were attached to the industry. Even if this number is increased to 49,000 by the addition of the 5,000 persons insured on the average of these years in ore mining and the 5,000 persons insured at coke ovens and by-product works, the proportion of the total insured population which this number represents is still only 7 per cent. The statistics secured from the 1924 Census of Production show similar results. In that year 31,566 persons were returned at the blast-furnaces, smelting, casting and rolling works of the Area and this represents 7 per cent. of the 453,800 persons recorded as employed by firms employing more than ten persons on the average in all the trades of the Area. Similarly, the value of the net output of these divisions of the industry amounted to £5.4 million or 6.3 per cent. of the net output of £85.5 million of all the trades of the North East Area in 1924.

2. In this case as in the case of the coal mining industry the North East is more dependent than the country as a whole upon the iron and steel industry. At the 1921 Census 258,000 persons were enumerated in the smelting, converting, refining and rolling of iron and steel in Great Britain out of an industrially occupied population of 19,369,000 persons, and thus only 1.3 per cent. of the industrially occupied population of Great Britain was engaged in the heavy branches of the iron and steel industry, whereas in this Area the corresponding proportion was 5.2 per cent. The Unemployment Insurance statistics reveal the same situation. In 1930, for example, 34,500 persons were insured in these sections of the industry out of a total insured population of 701,000 in the North East Area, whereas in Great Britain in that year 203,000 persons were insured at blast-furnaces, steel works and rolling mills, out of a total insured population of 12,138,000. In the North East the proportion of the insured population in these divisions of the iron and steel industry in 1930 was 4.9 per cent., while in Great Britain it was only 1.7 per cent.

3. Like all the heavy industries the iron and steel is predominantly a man's industry. The number of women for whom it provides employment is very small indeed. At the 1921 Census only 646 females were returned out of a total of 46,194 persons returned in the industry in that year, and in no year between 1923 and 1931 were more than 500 females employed in the industry out of the total of 47,000 persons at work in the industry on the average of these years.

(ii) **Pre-war and Present Position of the Industry.**

4. *Production.*—In 1913 the production of pig iron on the North East Coast amounted to 3.9 million tons or 37.7 per cent. of the total output of the country. On the average of the five years 1925-30 (excluding 1926), however, the pig iron production of the Area has been only 2.1 million tons annually, or 30.3 per cent. of the country's output, and in this period the highest output, amounting to 2.3 million tons or 31 per cent. of the country's output, was reached in 1929. Thus in the production of pig iron the North East Coast appears to have declined both absolutely and relatively to the country as a whole. The position occupied by the Area in the production of steel ingots and castings reveals the same general tendency. Thus in 1913 the North East Coast district produced 2 million tons of steel ingots and castings, or 26 per cent. of the country's production of 7.7 million tons in that year. On the average of the years 1925-30 (1926 excluded) it produced 1.9 million tons annually or 22.6 per cent. of the average annual output of 8.4 million tons in Great Britain over the same period. It is important to observe that in 1927 and in 1929 the production of steel ingots and castings in the Area amounted to 2.2 million tons in each of these years and thus exceeded the output of the best of the pre-war years.

5. The greater relative decline in pig iron production than in steel production which is revealed by these figures is attributable to a number of factors of which the most important are (1) the increased use of scrap in the production of steel; (2) the exhaustion of the Cleveland iron-ore supplies; (3) the increase throughout the country in the use of molten pig iron for steel making; (4) the decline in the demand for those qualities of pig iron required for forge and foundry purposes. Although no precise statistical information is available, the decline of pig iron production may be due in part to the loss of export markets for pig iron. The dependence of the iron and steel industry of the Area upon shipbuilding almost certainly accounts for the slight decline in the position of the area as a producer of iron and steel relatively to the country as a whole.

6. *Employment.*—No statistical information concerning the numbers employed in the principal divisions of the iron and steel industry of the North East Area is available for 1913.

(iii) **The Position of the Industry 1923-31.**1. *Employment and Unemployment 1923-31.*

7. *General.*—A detailed study of the iron and steel industry in the Area would require that separate considerations be given to each of the two principal divisions of the heavy branches of the industry, namely, blast-furnaces, and steel works and rolling mills, but in order to review the present and the prospective employment position of the industry the heavy branches will be considered together, although statistical information for each of the principal divisions will be exhibited and the prospects of each indicated. Further, in view of the dependence of Cleveland iron-ore mining and Durham coke production upon the conditions of the iron and steel industry, it would appear advisable to include these sections of the industry in this memorandum. It is true, of course, that not all of the coke produced in the Area is used for iron making. Much of it indeed, is used for other purposes, including export, but it is safe to assume that the bulk of the total coke production goes as raw material to the iron and steel industry.

8. *Course of Employment and Unemployment.* (a) *Employment.*—The figures of employment provided by the Ministry of Labour for certain years from 1923 to 1931, together with Index Numbers based on them are set out in Table 1. It is evident that

TABLE 1.—*Number and Index of Persons employed in the Iron and Steel Industry of the North East Coast, by Divisions, 1923-31* (1924=100).*

Year.	Iron-ore Mining.		Coke Ovens.		Blast-furnaces.		Melting and Rolling.		Total.	
	Number.	Index No.	Number.	Index No.	Number.	Index No.	Number.	Index No.	Number.	Index No.
1923	4,141	112	5,312	128	9,500	91·4	24,559	109	43,512	107
1924	3,677	100	4,154	100	10,390	100	22,576	100	40,797	100
1927	4,819	131	3,612	87·0	7,930	76·3	23,696	105	40,057	98·2
1929	4,442	121	3,692	88·9	7,101	68·3	22,449	99·4	37,684	92·4
1930	3,982	108	3,595	86·5	5,437	52·3	19,413	86·0	32,427	79·4
1931	2,921	79	2,621	63·1	4,614	44·4	13,363	59·2	23,519	57·6

* Numbers insured less numbers unemployed.

throughout this period there has been a continuous decline in the total number of persons at work in these divisions of the industry. The over-all decline between 1923 and 1930 amounts to 11,000 persons, and between 1924 and 1930 to 8,000 persons. Thus in 1930 the industry provided employment for 79 per cent. only of those who were employed in it in 1924. The collapse of the present year is measured by the fact that only 58 per cent. of the numbers who were at work in the industry in 1924 were recorded as in employment in the industry in July, 1931. The decline in the volume of employment as is shown later (Paragraph 13) has not

been paralleled by an equivalent decline in the production of iron and steel.

9. The over-all decline in employment hides the fact, revealed in Table 1, that the extent of the decline has been markedly different in the various divisions of the industry. Indeed, in the case of iron-ore mining, apart from the present year, more men were in employment in 1930 than in 1924. For this section of the industry 1924 was actually the worst year. Again, the decline in the volume of employment at coke ovens has been less marked than the decline in the total volume of employment in all four sections. On the other hand, in the case of the blast-furnaces division of the industry little more than half of the numbers employed in 1924 were at work in 1930, and in the present year only 44 per cent. of the persons employed in 1924 were occupied in this section. In the case of the steel making and rolling divisions the decline in employment, though considerable, has been relatively less than in the case of the blast-furnace section. But since the steel smelting and rolling divisions account for approximately 60 per cent. of the total volume of employment the absolute amount of the decline between 1924 and 1930, accounts for 3,000 of the total decline of 8,000 between these years.

10. Broadly speaking, the reduction in the volume of employment in the iron and steel industry of the Area between 1924 and 1930 is accounted for entirely by the decline of 5,000 persons at the blast-furnaces and 3,000 persons at the steel works and rolling mills, and this accounts for 12.5 per cent. of the decline of 64,000 in the numbers employed in all industries of the Area over the same period. The significance of this position is, of course, increased by the fact that iron and steel production is highly localized within the Survey Area. Probably fully 80 per cent. of the total number of persons employed in the iron and steel industry of the Area are at work on Tees-side. •

11. (b) *Unemployment.*—With regard to unemployment in the industry, the data provided by the Ministry of Labour show the following results :—

TABLE 2.—*Unemployment in the Iron and Steel Industry, by Divisions, and in All Industries of the North East Coast, 1923-31.*

Year.	Iron-ore Mining.		Coke Ovens.		Blast-furnaces.		Melting and Rolling.		Total.		All Industries.	
	Number.	Per-cent- age.	Number.	Per-cent- age.	Number.	Per-cent- age.	Number.	Per-cent- age.	Number.	Per-cent- age.	Number.	Per-cent- age.
1923	1,999	32.6	428	7.5	1,710	15.3	7,681	23.8	11,818	21.4	113,900	16.3
1924	1,713	31.8	526	11.2	1,500	12.6	7,924	26.0	11,663	22.2	90,300	12.9
1927	221	4.4	628	14.8	1,830	18.8	5,144	17.8	7,823	16.8	129,500	18.3
1929	228	4.9	468	11.3	809	10.2	4,591	17.0	6,096	13.9	100,300	14.5
1930	648	14.0	795	18.1	1,833	25.2	7,607	28.2	10,883	25.1	152,500	21.7
1931	1,329	31.3	1,889	41.9	2,546	35.6	11,027	45.3	16,791	41.7	242,800	34.2

It is clear that while the incidence of unemployment as measured by the percentage of insured persons unemployed has varied in intensity from one division of the industry to another, yet all four divisions show related movements. When the four divisions are considered together it appears that, for those persons who continued to be attached to the industry under the Unemployment Insurance scheme, the year 1929 was the best of the six. Further, in four out of the six years for which data are available the proportion of insured persons unemployed has been considerably greater in the iron and steel industry than in all the industries of the Area considered together. This, of course, was to be expected, for it is well known that fluctuations in employment and unemployment in heavy industries like iron and steel, which are engaged upon the construction of capital equipment, are greater than in industry generally.

12. (c) *Numbers Attached to the Industry.*—Throughout the years under review there has been a continuous decline in the number of persons attached to the iron and steel industry of the North East Area. The situation in this respect is exhibited in the following table :—

TABLE 3.—*Number of Persons Insured in the Iron and Steel Industry of the North East Coast, by Divisions, 1923–31 (1924=100).*

Year.	Iron-ore Mining.		Coke Ovens.		Blast-furnaces.		Melting and Rolling.		Total.	
	Number.	Index No.	Number.	Index No.	Number.	Index No.	Number.	Index No.	Number.	Index No.
1923	6,140	114	5,740	123	11,210	94	32,240	106	55,330	105
1924	5,390	100	4,680	100	11,890	100	30,500	100	52,460	100
1927	5,040	93·5	4,240	90·6	9,760	82·1	28,840	94·6	47,880	91·3
1929	4,670	86·6	4,160	88·9	7,910	66·5	27,040	88·7	43,780	83·5
1930	4,630	85·9	4,390	93·8	7,270	61·1	27,020	88·6	43,310	82·6
1931	4,250	78·8	4,510	96·4	7,160	60·2	24,390	80·0	40,310	76·8

Between 1923 and 1931 there has been a decline of 15,000 in the number of persons insured in the industry and between 1924 and 1931 the decline amounts to 12,000 persons. Little more than three-fourths of the numbers insured in the four divisions of the industry in 1924 were insured in them in 1931. Some part of the decline after 1927 is attributable to the exclusion of workers over 64 years of age from the Ministry of Labour classification. It is unlikely that the effect of this change, however, would account for more than 2,000 of the 12,000 persons, who have

ceased to be insured in the industry in the North East since 1924. There is no information available to show what has become of these 12,000 persons. Death, disability and retirement, no doubt, account for part of the decline, but it would seem probable that there has also been some movement into other industries and out of the Area.

2. Employment and Production.

13. It is convenient to bring together at this point the figures of production and employment in the blast-furnaces and steel smelting and rolling divisions of the industry in the North East Area in order to discover, if possible, what changes have taken place in the productivity of the workers in the industry in the course of the past six or seven years. Table 4 shows the position in this respect for certain years between 1923 and 1930.

TABLE 4.—*Employment and Production.*

Year.	Blast-furnaces.			Melting and Rolling.		
	Numbers employed.	Output of Pig Iron.		Numbers employed.	Output of Steel.	
		Million Tons.	Tons per person employed.		Million Tons.	Tons per person employed.
1913	—	3.87	—	—	2.03	—
1923	9,500	2.13	224	24,559	1.63	68.4
1924	10,390	2.25	216	22,576	1.72	76.2
1927	7,930	2.30	290	23,696	2.24	94.5
1929	7,101	2.35	331	22,449	2.21	98.4
1930	5,437	1.85	340	19,413	1.61	82.9
1931	4,614	—	—	13,363	—	—

In interpreting this table it must be remembered (1) that the Ministry of Labour figures of employment show the position in July of each year and not the average number of persons in employment during the entire year, and (2) that in the case of the steel works and rolling mills division the output per head has been arrived at in the absence of data showing separately the numbers employed at steel works and at rolling mills, by dividing the output of crude steel by the numbers employed in both sections. Some degree of error is, therefore, unavoidable but it is not likely to invalidate the broad conclusions which the table suggests, namely, that there has been a very marked increase in the output per person employed in each of the two principal divisions of the industry since 1924. The increase in the output per person employed has been continuous since 1924 in the case of the blast-furnace division, and from 1923 to 1929 in the case of steel melting. In 1929 an output of 2.35 million tons of pig iron, or 100,000 tons

greater than that of 1924, was obtained with fully 3,000 fewer work-people and an output of 2.21 million tons of steel, or almost 500,000 tons greater than that of 1924 was obtained by practically the same number of workers, namely, 22,500.

3. Production and Trade.

16. *Production.*—In view of the figures of production which have been given in the previous table it is not apparent that the iron and steel industry of the North East during the past seven years has been in a depressed condition or that it has operated very much below the level which it attained in the last of the pre-war years, i.e., in 1913. Indeed, as far as steel production is concerned, the average annual output of the years 1923-30 (excluding 1926) is very little less, at 1.8 million tons, than the output of 1913. In 1927 and 1929 the output of steel ingots and castings in the Area exceeded the output of 1913, and was almost certainly as large as the output of the Area in 1917, the year of maximum recorded output for the country.

17. With regard to pig iron production in recent years the case is not essentially different. Indeed the output of the blast-furnaces of the Area has been remarkably stable. Compared with the volume of output before the War, however, there has been a marked decline. The principal causes of this decline have been indicated previously.

18. *Imports and Exports.*—The movement of the volume of trade in iron and steel products from North East ports during the last few years is set out in the following table. It will be seen that the North East is very much more an exporter of iron and steel products than an importer of these products.

TABLE 5.—*Imports and Exports of Iron and Steel Products to and from North East Ports, 1924-30.*

Year.	(000's Tons.)	
	Imports.	Exports.
1924	194	669
1925	234	526
1927	418	609
1928	252	590
1929	211	597
1930	208	367

During this period there has been some slight tendency toward an increase in imports but it is quite apparent that the position of the industry in the Area is much more affected by the decline in the volume of exports than by the slight increase in imports. It has not been possible to obtain information concerning the principal North East Coast overseas markets for iron and steel products. On the assumption that the overseas markets of this Area are the same as those of Great Britain as a whole, it appears that the principal losses have been in the trade with Belgium, France, Japan and Canada. Of this group of markets Japan is the only one which shows a decline in total imports of iron and

steel. The others show an increase in imports and in them, therefore, British iron and steel has been displaced by the competition of other sources of iron and steel production.

(iv) **Factors Affecting the Industry.**

19. *General.*—It is unnecessary to investigate here the broad economic and political factors which have affected the position of the industry throughout the period since the end of the War. In the main they are the same as those which have operated in the case of the coal mining industry and a review of them will be found in the memorandum dealing with the coal trade. In the iron and steel industry an additional complicating factor has been the tariff policy of certain overseas countries. Italy, Japan, China, several South American Republics and India and Australia have increased the tariff on certain iron and steel products appreciably above the level which prevailed before the War. All of these countries form markets for iron and steel in which the North East might legitimately have expected to share. There can be little doubt that the tariff policy which these countries have adopted accounts in part, at least, for the decline in the export trade in iron and steel from the North East.

20. *Productive Capacity; Prices and Finance.*—Viewed as a whole the period 1924-30 has been one of comparative stability. The volume of employment at iron-ore mines, coke ovens, blast-furnaces, steel works and rolling mills, considered as a group, has remained remarkably stable over the period, and at a level which on the whole probably compares favourably with the employment position in the industry in the Area before the War. Nevertheless, the feeling prevails that the industry is not in a prosperous condition. For this there are a number of possible explanations. In the first place, the productive capacity of the industry in the Area is considerably greater than the output which has been achieved in any of the past seven years. In the blast-furnace division, for example, the 1913 output of pig iron was almost double that of any recent year, while in the case of the steel works it is well known that a very considerable addition to productive capacity was made in the last years of the War and that this capacity has remained unused. But it is now a long time ago since 1913 and considerable reductions in blast-furnace capacity have no doubt been made since that year, while in the case of the steel making section the additions to capacity were made more at the expense of the State than of the industry. In the second place, prices of iron and steel products have risen considerably less since 1913 than prices of commodities in general and since the relative cheapening of iron and steel has not been accompanied by a corresponding reduction of costs in the industry, the business of iron and steel production has tended to be unprofitable. The disparity in the level of iron and steel prices and commodity prices in general is,

however, tending to be reduced. In the third place, the financial structure of the industry in the post-war period has meant that the payment of debenture interest has necessitated heavy withdrawal from reserves so that little has been available on ordinary capital.

(v) **The Efficiency of the Industry.**

21. There can be no doubt that the iron and steel industry of the North East has maintained its efficiency relatively to that of other iron and steel producing centres within the country. Evidence of this is to be found in a number of directions.

22. *Equipment.*—The Committee on Industry and Trade showed that in the years between 1920 and 1926 13 new blast-furnaces of large capacity had been built on the North East Coast, and that the number of furnaces of large capacity was greater in the North East than in any other district. No additional furnaces have been built in the Area in the years up to 1929, but there has been a considerable amount of reconstruction and improvement of existing plant. Further, the output per furnace in blast is much greater in the North East than in the country as a whole and was considerably greater in 1929 than in 1924. Thus in 1929 the output per furnace per annum in the Area was 56,266 tons, whereas in Great Britain it was 47,958 tons, and in the North East the output per furnace has been increased from 52,047 tons per annum in 1924 to 56,266 tons in 1929.

23. Similar improvements have taken place in the steel works and rolling mills division of the industry. The Committee on Industry and Trade reported in 1928 that the North East Coast is specially well provided with large steel furnaces, having no less than 59 per cent. of all the open-hearth furnaces in the country of a capacity of 65 tons or more per heat. In 1929, of the 32 open-hearth furnaces of 100 tons nominal capacity and over in the country, 20 were situated on the North East Coast. Of these 20, four have been built since 1924. It is worthy of note that the number of open-hearth furnaces in the district has declined from 125 in 1913 to 99 in 1929, while the output of steel increased from 2.03 million tons to 2.21 million tons between these years. Thus an increased output has been obtained from fewer furnaces. Improvements have also been made to the rolling mills of the Area but no statistical data are available concerning the changes which have taken place in this section of the industry. In the coking industry the most notable change since pre-war years has been the substitution of the by-product coke oven for the beehive oven. In carrying out these extensions and improvements considerable additions have been made to the amount of capital invested in the industry.

24. *Organisation.*—Apart from improvements in plant and in the technique of production considerable improvements have taken place in the organisation of the industry in the Area. The most

striking of these has been the movement toward amalgamation among several of the most important iron and steel producing companies of the North East. The merging of Dorman Long & Company with Bolckow Vaughan in 1929 and then with Cargo Fleet in the Furness group in 1931 is the outstanding instance of the movement in the Area. This group has secured a complete ascendancy in the production of iron and steel products in the Cleveland district, and while it represents a considerable diversity in production it will be able to carry out a policy of concentration and specialisation within the various plants which it now controls. Some movement in this direction has already taken place through the closing down of old plants and the concentration of output in newer and more efficient establishments. There are still opportunities for further regional grouping of iron and steel making companies in the Area. On the other hand it is difficult to decide whether the grouping which has already taken place has come about spontaneously through a recognition of the economic advantages of concentration of control, or whether the industry in the Area has been tempted into the movement by the prospect of a tariff to be granted on condition of effective regional amalgamation. In addition to permanent grouping among iron and steel companies in the Area co-operation among independent producers is made possible through trade associations. The most powerful of these in the North East is probably the Cleveland Iron Masters' Association. With regard to marketing arrangements, the most interesting recent developments have been the establishment of a system of rebates to consumers of finished steel who agree to purchase solely from British manufacturers over a stated period and the extension of the overseas selling organization of several North East companies.

25. *Research*.—Research into various aspects of iron and steel production and utilisation is carried out by the principal iron and steel companies of the Area. The work covered includes the investigation of the physical and chemical properties of steel, the construction of furnaces and fuel economy. Further, under the auspices of the National Federation of Iron and Steel Manufacturers research into the properties of coke and the construction of coke ovens is being carried out by a Local Coal Research Committee at Armstrong College where metallurgical laboratories are also available to the industry in the Area for the investigation of special problems.

26. *Consequences*.—On the whole there can be little doubt that the increases in productive efficiency which have taken place in the iron and steel industry of the Area in recent years have enabled the industry to achieve a higher output with less labour than was required six or seven years ago. The variations in the volume of production from year to year make it difficult to estimate the extent of the displacement of labour which has resulted from the increase in technical efficiency in the industry. Nevertheless it may be hazarded that the displacement in the two principal divisions

of the industry amounts to about 8,000 persons and that broadly it is shared equally between them. In the case of the melting and rolling division, however, since approximately as many persons were in employment in 1929 as in 1924, the primary consequence of increased efficiency is rather the restriction in the opportunities for recruitment to employment than an actual displacement of work-people.

(vi) **Prospects of the Industry.**

27. Before making an estimate of the probable future volume of employment which the iron and steel industry of the Area is likely to afford it is essential to indicate briefly the prospects of the industry in the next few years.

28. It is sometimes suggested that through the gradual exhaustion of the Cleveland ores and special classes of coking coal in Durham the iron and steel industry of the Area is likely to decline. In this connection it must be remembered that the Cleveland iron and steel industry is very conveniently situated for the reception of ores from other districts within the country and from abroad. Indeed for many years it has been drawing its ore supplies from Cumberland, Lancashire and Northamptonshire and from countries overseas as well as from local sources and it is certain that it will be able to continue to do so for many years to come. With regard to coking coal, local supplies are by no means completely exhausted, and in any case it is probable that in the near future good coke will be obtained from a blend of various classes of other local coals. Considerable sources of limestone are also available within easy reach of the blast-furnaces of the Cleveland area. In short, there is no evidence that scarcity of supplies of essential raw materials will handicap the industry in the near future. Other factors affecting conditions of supply are the convenient geographical situation of the industry for the import of raw materials and the export of finished products and the facilities which it enjoys for obtaining supplies of equipment of all kinds. Further, the North East has a long tradition of knowledge and skill in the manufacture of iron and steel products and this is not without influence in determining the ability of the Area to maintain its place in the business of iron and steel production. Again, the relations between employers and employed are so established that the industry in the Area is free from the possibility of interruptions in activity through industrial disputes.

29. On the side of demand the fundamental factor is the prospect of those industries of the Area and of the country which are the consumers of iron and steel. The shipbuilding industry of the North East, with its subsidiary engineering activities, is the principal consumer of local iron and steel. It is probable that the volume of shipbuilding under construction in the next few years will at least not be less than that of recent years. The other principal domestic consumers of steel are the constructional and engineering

industries and the railways. There seems no reason to think that the demand of this group will be materially less in the near future than in the recent past.

30. Next comes the prospects of the export trade. It has been shown that in recent years the North East has been exporting on the average approximately 600,000 tons of iron and steel products per annum but that the tendency has been towards diminution of exports from the level of 1924. It is difficult to estimate the future prospects of the export trade with any certainty since it depends so much upon the course of international trade, the relative efficiency of the iron and steel industry of the Area compared with that of other competing countries, the tariff policy of importing countries and monetary policy at home and abroad. Thus the suspension of the gold standard in this country in 1931 might have been expected to act as a stimulus to the export of iron and steel, but its influence in this direction has probably been counteracted and outweighed by the suspension of the gold standard in some countries, by imposts of countervailing duties in others and by the dislocation of international trade which the economic and financial crisis of 1931 has carried in its train. With regard to the future therefore, all that can be hazarded is that the volume of exports from the North East is not likely to differ materially from that of recent years.

31. On the whole, therefore, it would seem a reasonable assumption that the activity of the industry in the Area would be about the same in the course of the next few years as it has been in the period between 1924 and 1931. On this basis an estimate can be made of the probable future labour requirements of the industry.

(vii) Future Labour Requirements and the Surplus.

32. It has been shown (Paragraph 13) that in 1929, a year of maximum production and minimum unemployment since 1923, approximately 29,500 persons were employed at the blast-furnaces, steel works and rolling mills of the Area. If to this number is added the 4,400 persons employed at iron ore mines, and the 3,600 persons engaged at coke ovens in the Area, then 37,500 would seem to be approximately the maximum number for which the industry is likely to provide employment in the next few years.

33. In July, 1931, there were 40,300 persons insured in these four divisions of the industry. It would appear, therefore, that there is still room for a reduction in the number of persons attached to it below the level of 1931. At present, there is an estimated surplus of about 2,800 persons attached to the industry above the numbers likely to be employed in the best year in the near future. This number would represent a rate of unemployment of 7 per cent. on the 40,300 persons at present insured in the industry in a very good year from the point of view of production. Accordingly,

some reduction in the number of persons attached to the industry would seem justifiable. A total of 38,000 persons in the four principal divisions would not be likely to impose any undue restriction on the labour supply of the industry. On this basis, therefore, the surplus number of workers is about 2,000. In the case of the iron and steel industry as in the case of the coal mining industry, if the numbers who were attached to the industry in 1923, a year of maximum employment, are still available, then the surplus is increased by 15,000 to 17,000 persons.

VI.—THE ENGINEERING INDUSTRY..

(Memorandum by Mr. E. Allen.)

(i) Statement of Trades Covered and their Distribution in the Survey Area.

(a) The main lines of engineering development on the North East Coast were laid early. When Messrs. Westmacott and Spencer were describing the engineering trades of this area, for the edification of the members of the British Association of 1863, they stated that "in referring briefly to the progress and present condition of the engineering manufactures of the Tyne and neighbouring districts it will be necessary to classify them under the following heads:—

- i. General Machine and Mill Work.
- ii. Stationary and Steam Engineering.
- iii. Locomotives.
- iv. Marine Engineering.
- v. Hydraulic Engineering.
- vi. Iron Bridges, Viaducts, Lighthouses, etc."

In referring to the progress and present condition of the engineering manufactures of the Tyne and neighbouring districts at the present time it is only necessary to add Electrical Engineering and the making of ordnance—some classes of which latter work are no doubt already included by these earlier writers under the heading "General Machine and Mill Work"—and re-group them according to the classification adopted by the Ministry of Labour. General Machine and Mill Work, Stationary and Steam Engineering, Locomotives, Hydraulic machinery, and Ordnance can then be classed together under General Engineering, while Marine Engineering, Electrical Engineering, and Constructional Engineering (No. vi in the list of 1863) form distinct groups by themselves.

It is true this does not exhaust completely the engineering activities of the Area but it covers those trades in which most persons are employed: and it is on this selection that the greater part of the attention of this Report will be directed.

The complete list of engineering and metal working trades of which an examination, more or less detailed accordingly as they

conform to the ruling indicated in the preceding paragraph, will be made is as follows. They divide themselves automatically into three main groups.

In the first is General Engineering, Electrical Engineering, Marine Engineering and Constructional Engineering.

In the second is the Making and Repairing of Motor Vehicles, Cycles and Aircraft, the Making and Repairing of Carriages and Carts, and the Making and Repairing of Railway Carriages, Wagons and Tramcars.

In the third, we find a more miscellaneous assortment including Stove, Grate, Pipe, and General Iron Founding, Electrical Wiring and Contracting, Electrical Cables and Lamps, Hand Tools and Cutlery, Bolts, Nuts, and Rivets, Brass and Allied Metal Ware, Heating and Ventilating Engineering, Watches, Clocks, Jewellery, etc., and an unclassified miscellaneous group called Metal Trades not Separately Specified.

In this Area only the first in this third group covers a sufficient number of persons to demand attention.

In the second group the first and the third, Motor Vehicles and Aircraft, and Railway Carriages and Wagons, jointly aggregate a figure which is almost as large as that for Electrical Engineering and might therefore be considered worthy of detailed examination, but, as will be shown later, partly because of difficulties in the statistical data recorded in connection with them, and partly because of dissimilarity in the character of the work they do, it has not seemed necessary to spend as much time on them as on those which are more compact and cover larger numbers of workpeople.

In the first group all are important. Against the engineering trades noted in 1863, we may therefore now set as representative of the engineering activities of the Survey Area, General, Marine, and Constructional Engineering, with the addition of Electrical Engineering and Stove, Grate, Pipe and General Iron Founding.

The change is not great and it seems to us that the fact that a list of engineering trades satisfactory in 1863 should be, with relatively little modification, satisfactory for 1931 is one of some importance. Far from being merely a device for overcoming the difficulties attached to making a beginning, it may serve as a text for much of the examination which follows.

(b) As might be expected from the geographical study of the Area which forms part of this enquiry the engineering trades group themselves on the three main rivers. Their grouping, however, provides contrasts as well as similarities.

The General Engineering trades are concentrated mainly on the Tyne. Here we find not merely more workers than in any other part of the Area but we also find a greater variety of trades represented.

An exception is provided in that Darlington is important as a locomotive engineering centre while the Stockton and Middlesbrough district seems to have the majority of the engineers' iron and steel founding firms. With these exceptions, the generalisation holds good.

Electrical Engineering is also largely the concern of Tyneside. It is made up in the main of two large firms which account between them for almost the whole of the workers recorded as insured in this industry, and a fringe of small firms, mostly employing under 50 persons, of which, again, the majority are in the Newcastle area.

Marine Engineering is closely allied to the fortunes of shipbuilding. As will be shown later, many shipbuilding firms are also producers of marine engines, and, as might be expected, its distribution is governed mainly by the same forces as have governed this form of activity. It is to be found on all rivers, but both from the figures of production and the number of the insured it is evident that the Tyne is a more important centre than the Wear or Tees.

Constructional Engineering and Stove, Grate, Pipe, and General Iron Founding provide a striking contrast. The first is concentrated in the southern part of the Survey Area and is mainly the concern of Darlington, Stockton and Middlesbrough. In the main this is true also of the second, but, since firms tend to be smaller and the nature of their work more generalised, there is a stronger tendency than in Constructional Engineering for them to be more widely situate. The tendency however is not sufficiently strong to make this statement regarding their localization in the south invalid.

Finally, it seems clear from an examination of the smaller metal working trades, and particularly of the section, which, defying classification, has to be generally termed "metal trades not separately specified", that both from the point of view of variety of work done and numbers insured, Tyneside is again their centre.

(ii) Employment and Unemployment.

(a) It has already been stated that the Engineering Trades classification adopted by the Ministry of Labour gives us three main engineering groups. From this it might seem therefore that the most straightforward procedure would be to pass at once to an examination of engineering employment on these lines. A glance at the different proportions in which workers are attached to the different trades shows, however, that a better way of procedure, at least at the outset, is to display them in the two groups into which, accordingly as they employ a relatively large number or a relatively small number of workers, they automatically divide themselves.

Taking the Ministry of Labour figures of the numbers insured we find that we have one group, General Engineering, Electrical

Engineering, Marine Engineering, Constructional Engineering, and Stove, Grate, Pipe, and General Iron Founding, in which the numbers are relatively large, and Motor Vehicles, Cycles and Aircraft, Carriages and Carts, Railway Carriages and Wagons, Electric Wiring and Contracting, Electric Cables and Lamps, Hand Tools and Cutlery, Bolts, Nuts and Rivets, Brass and Allied Metal Ware, Heating and Ventilating Engineering, Watches and Clocks, and the Miscellaneous unspecified group in which the numbers are relatively small or when they seem large, as in Motor Vehicles, Cycles and Aircraft, and Railway Carriages and Wagons the proportion of the country's workers domiciled in the Survey Area is below the proportion so domiciled of all workers taken together.

The following tables give a clear picture of the numbers which are involved :—

TABLE 1.—Numbers of Insured Workers in certain engineering trades on the North East Coast.

Trade.	Number in 1923.	Percentage of Total.	Number in 1930.	Percentage of Total.
<i>Group A.</i>				
General Engineering	37,200	43·0	31,150	40·0
Marine Engineering	25,610	30·0	19,610	25·0
Electrical Engineering	3,830	4·0	5,680	7·2
Constructional Engineering	5,210	6·0	5,730	7·3
Stove, Grate, Pipe, and General Iron Founding.	4,360	5·0	5,590	7·0
<i>Group B.</i>				
Motor Vehicles, Cycles and Aircraft	2,290	2·6	2,680	3·4
Carriages and Carts	660	0·8	440	0·6
Railway Carriages and Wagons	2,190	2·5	2,010	2·5
Electric Wiring and Contracting	510	0·6	580	0·7
Electric Cables and Lamps	560	0·6	340	0·4
Hand Tools and Cutlery	190	0·2	150	0·2
Bolts, Nuts, and Rivets	180	0·2	320	0·4
Brass and Allied Metal Ware	260	0·3	140	0·2
Heating and Ventilating Engineering.	290	0·3	270	0·3
Watches and Clocks	310	0·4	130	0·2
Metal Trades not separately specified.	3,080	3·5	3,630	4·6
Totals	86,730	100·0	78,450	100·0

The two years 1923 and 1930 are given so that it may be perfectly clear that the broad groupings so displayed are truly representative of engineering trade groupings in the Area and it is stressed that no attention should be directed at this stage to the variations that have taken place over the period. Such analysis is reserved for later.

Turning to the figures it is evident that of the different trades in the first group General and Marine Engineering are easily the most important. The other three trades, even taken together, do not in either period reach an aggregate sufficient to out-top them singly. The main point of importance in connection with the trades of Group "B" is the small number each in general includes.

(b) This smallness becomes even more striking when comparison is made between the number attached to each trade in the Area and the number for the country as a whole and their relationship expressed in the form of a percentage proportion. Again it seems advisable to take them in the two broad groups, and again the essential points are best displayed by tabulation. We give the figures for one year only so that crowding of the table may be avoided, though as a guide we may state that more detailed examination is made of this matter of proportions in section (e) below.

TABLE 2.—Comparison between the numbers attached to certain engineering trades in the Survey Area and in the country as a whole with their proportions expressed as a percentage for the year 1923.

Group A.

(a)	General Engineering.	Electrical Engineering.	Marine Engineering.	Constructional Engineering.	Stove, Grate, Pipe, and General Iron Founding.
Great Britain	658,670	60,850	59,730	23,210	77,840
Survey Area	37,200	3,830	25,610	5,210	4,360
Proportion in the Survey Area.	Per cent. 5.6	Per cent. 6.3	Per cent. 42.9	Per cent. 22.4	Per cent. 5.2

Group B.

(b)	Motor Vehicles.	Carriages and Cabs.	Railway Carriages and Wagons.	Electric Wiring.	Electric Cables.	Hand Tools and Cutlery.	Bolts, Nuts and Rivets.	Brass and Allied Metal Ware.	Heating and Ventilating Engineering.	Watches and Clocks.	Metal Trades not Separately specified.
Great Britain	190,430	27,800	50,370	11,790	72,030	29,940	29,720	32,400	5,310	49,150	164,240
Survey Area	2,290	660	2,190	510	560	190	180	260	290	310	3,080
Proportion in the Survey Area.	Per cent. 1.2	Per cent. 2.4	Per cent. 4.3	Per cent. 4.3	Per cent. 0.8	Per cent. 0.6	Per cent. 0.6	Per cent. 0.8	Per cent. 5.5	Per cent. 0.6	Per cent. 1.8

The points which emerge from these two sets of figures are :—

- i. That whatever may be the position in absolute figures, the most important industries are, on the showing of these proportions, Marine and Constructional Engineering.
- ii. That General and Electrical Engineering, together with Stove, Grate, Pipe, and General Iron Founding, Heating and Ventilating Engineering, Motor Vehicles, Cycles, and Aircraft, and Railway Carriages and Wagons show proportions closely near the general proportion of all trades in the Area taken together, but that the last three trades, and particularly Heating and Ventilating Engineering do not account for any considerable number of work-people,
- iii. and that with these three exceptions the whole group of trades, eleven in number, of Table 2b is not only absolutely small as regards the numbers to whom it offers employment but that also the proportions of these trades in the Survey Area are far below the general average.

To summarise the position which has so far been established, it is evident that judged by actual numbers recorded the most important trades in this Area are General and Marine Engineering, that judged from the proportion domiciled in the Area the most important are Marine and Constructional Engineering, and that in the numerous smaller engineering metal working trades this Area is, with two or three exceptions, extremely poorly represented.

(c) We must ask now, how have the numbers attached to the different industries varied year by year? And this question will be tackled by first showing the movement which has taken place in the figures for the country as a whole, next, the movement in the figures for the Survey Area, and finally, an attempt will be made to relate the two together. Before doing so, however, it is necessary to make two cautionary statements. In the first place, the figures used are the "insured" figures published, or as in the case of those for the Area, abstracted for us by the Ministry of Labour. It is unfortunate that they are not truly comparable over the whole period. From the end of 1927 onwards a change in classification operates to reduce the number of the insured by eliminating any record of the age group 64 and over. If in any trade, therefore, a decrease is discerned between 1923 and 1930, some part of that decrease—if small may be the whole—must be laid at the door of the change in classification. And, conversely, it follows that any increase discernible underestimates the real increase that has actually taken place. Where the decrease is great, however, no great danger of reading into the figures movements which have not in fact been made need be feared.

In the second place, the movements of the figures are expressed throughout as percentages of the figure for the year 1924. They are index numbers with 1924 as their base. Since a record of percentage movements only would lead, possibly, to invalid conclusions seeing that it gives no indication of the number for which it is an expression, and further, seeing that if the number initially be small, a given change will cause a much bigger percentage change than would be the case if the initial number were large,

the actual numbers for the beginning year, 1923, and the concluding year, 1930, are also given.

We turn now to the figures and give first the variation in the number insured in Great Britain in the main engineering group.

TABLE 3.—Variations in the numbers of Insured Persons attached to certain engineering trades in Great Britain for the years 1923, 1924, 1927, 1929, and 1930. (1924=100.)

Trade.	Number Insured in 1923.	Percentage Variations.					Number Insured in 1930.
		1923.	1924.	1927.	1929.	1930.	
General Engineering ...	658,670	106	100	92	93	94	585,300
Electrical Engineering...	60,850	86	100	109	118	126	89,460
Marine Engineering ...	59,730	99	100	85	88	89	53,750
Constructional Engineering.	23,210	97	100	112	117	116	27,930
Stove, Grate, Pipe, and General Iron Founding.	83,590	103	100	104	109	111	90,150

Two movements are obvious. General Engineering and Marine Engineering have declined while Electrical and Constructional Engineering, and Stove, Grate, Pipe, and General Iron Founding have expanded. It is not possible to say to what degree these movements have been affected by the change in classification, but a calculation which has been made from the figures which were published by the Ministry of Labour in the 20th Abstract of Labour Statistics makes it clear that the decreases recorded here in the first two trades are much more than enough to account for the percentage decrease due to the change. For both, it may be said, the location of the changes is, in the main, not Whitehall, but the places where these activities are actually carried on.

On the other hand, the true increase of the last three is slightly masked and the increase here is definitely theirs by right.

Turning now to the vehicle group, the picture which they present is as follows :—

TABLE 4.—Variations in the numbers of Insured Persons attached to certain engineering trades in Great Britain for the years 1923, 1924, 1927, 1929, and 1930. (1924=100.)

Trade.	Number Insured in 1923.	Percentage Variations.					Number Insured in 1930.
		1923.	1924.	1927.	1929.	1930.	
Motor Vehicles, Cycles, and Aircraft.	190,430	94	100	113	121	121	244,980
Carriages and Carts ...	27,800	112	100	81	75	76	18,830
Railway Carriages and Wagons.	50,370	96	100	104	104	104	53,880

The two most important changes here are a pronounced and on the whole steady decline in Carriages and Carts, and an increase in the other two, pronounced and steadily upwards in Motor Vehicles, Cycles, and Aircraft, and slight but maintained in Railway Carriages and Wagons. Apart from the last movement, they are results which are not inconsistent with general current opinion.

In the more varied group, numbers are on the whole smaller. Movements, therefore, should not be too readily compared with those which precede them, and it is perhaps not altogether redundant to draw attention again to the necessity of keeping in mind the numbers to which the percentages refer.

They run as follows :—

TABLE 5.—Variations in the numbers of Insured Persons attached to certain engineering trades in Great Britain for the years 1923, 1924, 1927, 1929, and 1930. (1924=100.)

Trade.	Number Insured in 1923.	Percentage Variations.					Number Insured in 1930.
		1923.	1924.	1927.	1929.	1930.	
Electrical Wiring and Contracting.	11,790	94	100	111	130	145	18,250
Electric Cables and Lamps.	72,030	96	100	113	132	138	102,510
Hand Tools and Cutlery...	29,940	95	100	109	106	112	35,150
Bolts, Nuts, and Rivets ...	29,720	108	100	92	92	95	26,280
Brass and Allied Metal Ware.	32,400	122	100	108	105	107	28,420
Heating and Ventilating Engineering.	5,310	94	100	129	153	162	9,220
Watches and Clocks ...	49,150	103	100	91	87	89	42,620
Metal Trades not separately specified.	164,240	93	100	103	108	114	201,330

In several there is an increase to be recorded, substantial so far as numbers are concerned in Electrical Wiring and Contracting, Electric Cables and Lamps and the miscellaneous group, and remarkable on a percentage basis, though this, as has been stated, must be toned down for the last named, in Electric Cables and Lamps, and Heating and Ventilating Engineering. Decreases, as from 1924, are recorded in two groups only, i.e., Bolts, Nuts, and Rivets, and Watches and Clocks, both trades in which relatively small numbers are involved.

We may now cast the findings of this section of our inquiry into the form of a balance sheet, industries showing an increase, relative to 1924, on the one hand, and industries showing a decrease on the other.

Industries which show an increase.

Electrical Engineering.	Electrical Wiring and Contracting.
Constructional Engineering.	Electric Cables and Lamps.
Motor Vehicles, Cycles, and Aircraft.	Hand Tools and Cutlery.
Railway Carriages and Wagons.	Brass and Allied Metal Ware.
Stove, Grate, Pipe, and General Iron Founding.	Heating and Ventilating Engineering.
	Metal Trades not separately specified.
Increase in insured involved	... .. 143,060.

Industries which show a decrease.

General Engineering.	Bolts, Nuts, and Rivets.
Marine Engineering.	Watches and Clocks.
Carriages and Carts.	
Decrease in insured involved	... .. 53,980.

Thus there is a net addition of 89,080 to the number of insured persons in the Engineering Trades taken altogether; and the ratio of the number added to the number lost is as 2.65 :1.

(d) How, then, have these industries fared in the Survey Area? Taking them in the same order, the five main engineering trades show the following changes:—

TABLE 6.—*Variations in the numbers of Insured Persons in certain engineering trades in the Survey Area for the years 1923, 1924, 1927, 1929 and 1930. (1924=100.)*

Trade.	Number Insured in 1923.	Percentage Variations.					Number Insured in 1930.
		1923.	1924.	1927.	1929.	1930.	
General Engineering ...	37,200	110	100	99	93	92	31,150
Electrical Engineering...	3,830	87	100	112	111	121	5,680
Marine Engineering ...	25,610	112	100	83	82	86	19,610
Constructional Engineering.	5,210	100	100	106	113	110	5,730
Stove, Grate, Pipe, and General Iron Founding.	4,360	92	100	104	106	118	5,590

In two trades, General Engineering and Marine Engineering, there is a decline, pronounced in the case of the latter, less so, particularly if the change in classification be borne in mind, in the case of the former. And broadly speaking it may be said that the tendencies are persistent. In three trades, Electrical Engineering, Constructional Engineering and Stove, Grate, Pipe, and General Iron Founding there is an increase. In the first, apart from the sag in 1929, which, of course, may be discounted, it is pronounced and steady; in the second it is more subdued at the start and shows the effect of the general depression of 1930 by a fall; while in the third is displayed a thrustfulness remarkably steadily maintained. No great difference to the general impression gained from a first glance at the figures is made, however, by this more detailed scrutiny, and in any case only the broadest and most general survey is here appropriate. We may therefore turn to the vehicle group.

TABLE 7.—Variations in the Numbers of Insured Persons in certain engineering trades in the Survey Area, 1923, 1924, 1927, 1929, and 1930.

(1924 = 100.)

Trade.	Number Insured in 1923.	Percentage Variations.					Number Insured in 1930.
		1923.	1924.	1927.	1929.	1930.	
Motor Vehicles, Cycles, and Aircraft.	2,290	98	100	107	114	115	2,680
Carriages and Carts...	660	125	100	93	75	83	440
Railway Carriages and Wagons.	2,190	201	100	197	200	191	2,010

Here, Motor Vehicles, Cycles, and Aircraft show a steady increase, Carriages and Carts a pronounced and fairly steady decline and Railway Carriages and Wagons a small decline over the whole period with an inexplicable drop in 1924, which we are inclined to lay to the charge of a missing integer in the statistics. It may be that an important firm ceased work in 1924, resuming again for 1927, but no record of such a spectacular move has been found.

The more assorted group shows a decidedly patchwork appearance. It is in this connection that the caution regarding the effect of relatively small absolute changes when expressed as percentage variations on a number initially small becomes particularly important. One must be prepared to discount an even more vivacious statistical display than before.

TABLE 8.—Variations in the numbers of Insured Persons attached to certain engineering trades in the Survey Area for the years 1923, 1924, 1927, 1929 and 1930.

(1924 = 100.)

Trade.	Number Insured in 1923.	Percentage Variations.					Number Insured in 1930.
		1923.	1924.	1927.	1929.	1930.	
Electrical Wiring and Contracting.	510	119	100	133	128	135	580
Electric Cables and Lamps.	560	104	100	80	59	63	340
Hand Tools and Cutlery.	190	100	100	74	63	79	150
Bolts, Nuts, and Rivets.	180	55	100	127	106	97	320
Brass and Allied Metal Ware.	260	144	100	128	83	78	140
Heating and Ventilating Engineering.	290	100	100	100	114	93	270
Watches and Clocks	310	129	100	75	63	54	130
Metal Trades not Separately Specified	3,080	94	100	91	100	111	3,630

Regarding their movement as being from the base year 1924, two, only one of them however important in the group, register an increase, while six register a decrease. In no case, however, is the number involved large, although the percentage variation may be large, and the numbers who swell the two groups recording increases are more than enough to balance the losses for all those trades recording decreases, even though they be all taken together.

We may do now for the Survey Area what was done for the country as a whole and divide them into two groups accordingly as they record increases or decreases. The result is given below :—

Industries which show an increase.

Electrical Engineering.	Stove, Grate, Pipe, and General Iron
Constructional Engineering.	Founding.
Motor Vehicles, Cycles, and Aircraft.	Electrical Wiring and Contracting.
	Metal Trades not separately specified.
Increase in insured involved	... .. 3,480.

Industries which show a decrease.

General Engineering.	Hand Tools and Cutlery.
Marine Engineering.	Bolts, Nuts, and Rivets.
Carriages and Carts.	Brass and Allied Metal Ware.
Railway Carriages and Wagons.	Heating and Ventilating Engineering.
Electric Cables and Lamps.	Watches and Clocks.
Decrease in insured involved	... .. 6,470.

Thus, comparing the position shown by the Area with that shown by Great Britain, the Area has ten trades which show a decrease and six trades which show an increase as against the five and 11 trades in each category respectively which were registered by the country. The Area and the country share in common decreases in General Engineering, Marine Engineering, Carriages and Carts, Bolts, Nuts, and Rivets, and Watches and Clocks, but in addition the Area has to record on the decreased side of its balance sheet Railway Carriages and Wagons, Electric Cables and Lamps, Hand Tools and Cutlery, Brass and Allied Metal Ware, and Heating and Ventilating Engineering, all of which are returned by the country on the increased side of the sheet. Finally the ratio of the number added to the number lost is as 0.54 :1 which may be compared with the country ratio of 2.65 :1, and whereas the country registered a net addition of 89,080 persons, the Survey Area has to record a net loss of 2,990. Perhaps, however, this is a matter, not for gloom, but for congratulation. It depends upon the trade in which the losses have been made and the degree of employment which the trend of trade has been allowing them to offer. This is a matter for later sections of this inquiry.

(e) Having thus established what the movements of the insured have been in the different engineering trades for Great Britain and for the Survey Area taken separately we may now attempt to relate the two together.

For this purpose it is no longer necessary, we think, to load our report with figures and comments relating to the numerous minor metal working trades. All the figures necessary for full examination are given in the appendix and it is obvious that from the point of view of numbers in the Survey Area, only General, Electrical, Marine, and Constructional Engineering and Stove, Grate, Pipe, and General Iron Founding are really important. Attention will, therefore, in the following sections be paid only to these: mention being made of the remainder when special factors call for it.

The picture which these five trades present is as follows :—

*TABLE 9.—Variations in the numbers of Insured Persons in certain engineering trades. Great Britain and Survey Area compared for the years 1923, 1924, 1927, 1929 and 1930.

(1924 = 100.)

		Number Insured in 1923.	Index.					Number Insured in 1930.
			1923.	1924.	1927.	1929.	1930.	
All Industries and Services.	N.E. Area.	702,260	100	100	100	98	100	701,300
General Engineering, Engineers' Iron and Steel Founding.	Gt. Britain	658,670	106	100	92	93	94	585,300
	N.E. Area	37,200	110	100	99	93	92	31,150
Electrical Engineering.	Gt. Britain	60,850	86	100	109	118	126	89,460
	N.E. Area	3,830	87	100	112	111	121	5,680
Marine Engineering.	Gt. Britain	59,730	99	100	85	88	89	53,750
	N.E. Area	25,610	112	100	83	82	86	19,610
Constructional Engineering.	Gt. Britain	23,210	97	100	112	117	116	27,930
	N.E. Area	5,210	100	100	106	113	110	5,730
Stove, Grate, Pipe, and General Iron Founding.	Gt. Britain	83,590	103	100	104	109	111	90,150
	N.E. Area	4,360	92	100	104	106	118	5,590

* See footnote to Table 10.

We know already that General Engineering and Marine Engineering have declined both in Great Britain and in the N.E. Area and we know also that the other three have increased. It is superfluous to comment on this further. The most striking feature calling for comment is, rather, the way in which broadly the two sets of figures, for all trades, move in unison. In some instances

as, e.g. in Marine Engineering between 1923 and 1924, there are movements which run counter to this generalisation, but in the main they are strongly in its support. If now a glance be given at the figures which for convenience have been relegated to the appendix it will be seen that they too with minor exceptions in Electric Cables and Lamps, Hand Tools and Cutlery, and Bolts, Nuts, and Rivets, prove this to be the general rule.

In short it seems clear therefore that, taking all the engineering trades together, each, with one or two exceptions, tends broadly to repeat the movement of the insurance figures of the country as a whole. Such differences as occur are either not sufficiently great to mark an obviously dissimilar trend, or are due to the small figures to which, in the Survey Area, they relate. They differ markedly in their several ways from the trend of all industries in the Survey Area taken together and it is evident from this alone that the general index masks important variations in the different trades which cannot be disregarded and which condemns any facile optimism which might be based upon it.

(f) The question to be asked now is whether such a conclusion holds good for employment, and it is proposed to treat the indices of employment in the same way as the indices of insured persons. Since it has been established that there are five trades only in the Survey Area which merit detailed consideration, and since we may take it for granted that the numbers employed will give us much the same relative groupings as the numbers of the insured we may pass at once to the tables in which the indices for the Area are compared with those for Great Britain.

It is perhaps necessary, however, to preface this attempt with an explanation of how the estimate of the numbers 'employed' is arrived at. It is based on the Insurance statistics supplied by the Ministry of Labour. These give the number insured in each trade and the number unemployed. The estimate of the numbers employed is made simply by subtracting the one from the other. It makes no claim therefore to give the actual numbers employed, for it does not allow for absenteeism from whatever cause this may be due. Further, it is constructed as though the change in classification of 1927 already mentioned had not occurred. It is dependent therefore on the assumption that any causes operating to make simple deduction of the unemployed from the insured an over-estimate of employment are the same for Great Britain and for the Survey Area alike.

With these cautionary notes we may pass to the table in which the indices of employment for Great Britain and those for the Survey Area are compared :—

*TABLE 10.—Changes in Numbers of Employed Persons. Great Britain and Survey Area compared.

(1924=100).

		Number Insured in 1923.	Index.					Number Insured in 1930.
			1923.	1924.	1927.	1929.	1930.	
All Industries and Services.	N.E. Area.	588,373	96	100	94	96	89	548,850
General	Gt. Britain	520,363	100	100	97	99	93	493,508
Engineering.	N.E. Area	23,185	94	100	103	104	95	23,365
Electrical	Gt. Britain	56,928	99	100	110	119	121	82,850
Engineering.	N.E. Area	3,396	86	100	116	114	131	5,187
Marine	Gt. Britain	46,917	92	100	85	95	89	45,580
Engineering.	N.E. Area	17,897	101	100	84	91	88	15,604
Constructional	Gt. Britain	20,402	97	100	118	121	111	23,350
Engineering.	N.E. Area	4,074	90	100	110	118	99	4,485
Stove, Grate, Pipe, and General	Gt. Britain	69,142	94	100	105	109	104	76,177
Iron Founding.	N.E. Area	3,198	89	100	111	115	119	4,263

* In comparing these tables with tables in the Memorandum on Labour it should be kept in mind that the basis throughout in that memorandum is the age group 16-64.

As was true of the insured, so now with but one exception Electrical Engineering, Constructional Engineering, and Stove, Grate, Pipe, and General Iron Founding record both in the country and in the Area an increase in numbers employed over the period: this exception resides in the sag in Constructional Engineering between 1929 and 1930. In the first and last it is clear that on a percentage basis the showing of the Area is better than that of the country. In the second the Area makes more headway than the country between 1923 and 1924, but from then onwards seems to lag behind, and suffers more acutely in the depression of 1930. General Engineering and Marine Engineering preserve the partnership built up in the "insured" and show a decline. Again, broadly, it would seem, there is a tendency for the figures of the Area and those of the country to move together. And, with much the same exceptions as had to be noted in connection with the insured statistics, the figures of the trades in the Appendices add their confirmation.

Given this general agreement between (i) the movement of the insured figures in Great Britain and in the Area, and (ii) the movement of the estimates of employment in Great Britain and the Area, it might be expected that a similar agreement could be found in the movement of the indices showing the numbers unemployed. This is done for the five major trades of the Area in the table which follows and particulars of the minor trades are, as before, given in the Appendix:—

TABLE 11.—Changes in Numbers of Unemployed Persons. Great Britain and Survey Area compared.

(1924=100).

		Number in 1923.	Index.					Number in 1930.
			1923.	1924.	1927.	1929.	1930.	
All Industries* and Services.	N.E. Area.	113,887	—	—	—	—	—	152,450
General	Gt. Britain	138,307	159	100	63	59	106	91,792
Engineering.	N.E. Area	14,015	154	100	92	60	86	7,785
Electrical	Gt. Britain	3,922	126	100	91	64	169	6,610
Engineering.	N.E. Area	434	94	100	76	109	106	493
Marine	Gt. Britain	12,813	141	100	83	57	90	8,170
Engineering.	N.E. Area	7,713	155	100	78	47	80	4,006
Constructional	Gt. Britain	2,802	95	100	70	97	156	4,580
Engineering.	N.E. Area	1,136	162	100	81	81	177	1,245
Stove, Grate, Pipe, and General	Gt. Britain	14,448	158	100	82	92	154	13,973
Iron Founding.	N.E. Area	1,162	99	100	85	78	113	1,327

* See section on Labour.

The position here is not so easy to interpret. The numbers involved in the indices of the Survey Area are very much smaller than in previous instances and therefore there is not the same appearance of movement in unison as before. There are wider gaps between the relative regional readings and the appearance is one of jerkiness. If such differences be disregarded, however, then the unison between the country and the Area, which we are now ready to claim is a useful working generalisation, may reasonably be read, we think, from the movements of the indices in General Engineering, Marine Engineering, the last four years recorded for Constructional Engineering and the three middle years recorded for Stove, Grate, Pipe, and General Iron Founding.

If we turn now to the remaining data with which the Insurance statistics furnish us, namely, the percentages of unemployment, we again find, as the following table shows, a strong tally between the movement of the two sets of figures, but we also find an important difference. The average round which they do their dance is not the same in the two cases. The average for the Survey Area is markedly higher than that for the country as a whole. So far as the figures themselves go they confirm the run of the data already given and make Electrical Engineering easily the brightest spot in the engineering firmament. One's enthusiasm is only damped by the recollection that the numbers which it includes both in the Area and in the country are relatively small. The second point which emerges is that after a mid period of relatively low percentages of unemployment, 1930 is for all trades except

Electrical Engineering in the Survey Area a year of depression, and that with three exceptions 1929 is the best year. And in the main this is a conclusion which is also borne out by the data for the other trades in the appendices. In our opinion, however, emphatically the most important feature of the tables which follow is the tendency for the Area's average percentage of unemployment to be so persistently higher than for the country as a whole. It is a point to which attention has to be turned time and again in this report, and we believe that it crystallises for us in one expression the sum of the economic and social difficulties of this Area.

TABLE 12.—Variation of Percentages of Unemployment, Great Britain and Survey Area compared.

		Number Insured in 1923.	Percentage Unemployed.					Number Insured in 1930.	Av. per-centage unemployed.
			1923.	1924.	1927.	1929.	1930.		
II Industries and Services.	N.E. Area.	702,260 *Ages 16-upwards.	16·2	12·8	18·4	14·5	21·7	701,300	16·6
General	Gt. Britain	658,670	21·2	14·2	9·5	8·8	15·7	585,300	13·9
Electrical Engineering.	N.E. Area	37,200	37·6	26·9	24·9	17·5	24·9	31,150	26·4
Electrical Engineering.	Gt. Britain	60,850	6·6	5·5	4·7	4·4	7·4	89,460	5·7
Marine Engineering.	N.E. Area	3,830	11·3	10·5	7·1	10·3	8·7	5,680	9·6
Marine Engineering.	Gt. Britain	59,730	21·4	15·2	14·8	8·7	15·2	53,750	15·1
Constructional Engineering.	N.E. Area	25,610	30·1	21·8	20·6	12·4	20·4	19,610	21·1
Constructional Engineering.	Gt. Britain	23,210	12·1	12·3	7·7	10·1	16·4	27,930	11·7
Boilers, Grate, Pipe, and General Iron Founding.	N.E. Area	5,210	21·9	13·4	10·4	9·7	21·8	5,730	15·5
	Gt. Britain	83,590	17·3	11·4	8·9	9·5	15·5	90,150	12·5
	N.E. Area	4,360	26·6	24·6	20·1	18·2	23·8	5,590	22·7

* In section on Labour the basis is 16-64.

The general position of the engineering industries of the North East Survey Area so far as it is revealed by the Insurance statistics of the Ministry of Labour may thus be summarized in two statements and a comprehensive table which, taking up the point made in Table 2, Section b shows in detail the relationship between the Area and the country as a whole as regards the numbers insured, employed, and unemployed. The statements are, firstly, that it is clear that in all trades except one or two of the minor metal working trades, the movements of the Insurance statistics of Great Britain are mirrored in the movements of the Insurance statistics of the Survey Area, and, secondly, that the Survey Area's engineering trades, whether large or small, whether depressed or prosperous, whether expanding or contracting, have a larger average percentage of unemployment over the period, a larger fringe of undemanded labour, than the country as a whole. The second of these two statements finds full confirmation in Table 13 and Table 14 which is

divided into groups A and B on the principle adopted in this section.

TABLE 13.—Averages of Unemployment for the Years 1923, 1924, 1927, 1929 and 1930.

	<i>Gt. Britain.</i>	<i>N.E. Survey Area.</i>
General Engineering	13·9	26·4
Electrical Engineering	5·7	9·6
Marine Engineering	15·1	21·1
Constructional Engineering	11·7	15·5
Motor Vehicles, Cycles, and Aircraft	8·3	10·7
Carriages and Carts	9·8	13·9
Railway Carriages, Wagons, etc.	6·7	10·3
Stove, Grate, Pipe, and General Iron Founding	12·5	22·7
Electrical Wiring and Contracting	9·9	17·1
Electric Cables and Lamps	7·5	21·9
Hand Tools, Cutlery, etc.	17·8	25·6
Bolts, Nuts, Rivets, etc.	12·9	29·8
Brass and Allied Metal Ware	13·9	14·4
Heating and Ventilating Engineering	6·3	10·5
Watches and Clocks	11·0	16·5
Metal Industries not Separately Specified	10·6	13·2

TABLE 14.—Comparison of North East Coast Survey Area and Great Britain as revealed by Insurance figures. North East Coast figures expressed as a percentage of Great Britain.

GROUP A.

	General Engineering.	Electrical Engineering.	Marine Engineering.	Constructional Engineering.	Stove, Grate, Pipe, and General Iron-founding.
Insured—					
1923	5·6	6·3	42·9	22·4	5·2
1924	5·53	6·21	37·8	21·7	3·86
1929	5·41	5·90	35·2	20·9	4·46
1930	5·3	6·0	36·5	20·5	6·2
Employed—					
1923	4·5	5·1	38·1	19·9	4·6
1924	4·62	5·90	34·7	21·5	2·62
1929	4·89	5·48	33·7	21·0	3·3
1930	4·7	6·3	34·2	19·2	5·6
Unemployed—					
1923	10·1	11·1	60·2	40·4	8·0
1924	10·5	11·9	54·7	23·9	10·7
1929	10·8	13·7	50·2	20·0	10·9
1930	8·5	7·4	49·0	27·2	9·5

GROUP B.

	Motor Vehicles, etc.	Carriages and Carts.	Railway Wagons, etc.	Electric Wiring.	Electrical Cables.	Hand Tools and Cutlery.	Bolts, Nuts, and Rivets.	Brass and Allied Metal Ware.	Heating and Ventilating Engineering.	Watches and Clocks.	Metal Trades not separately specified.
Insured—											
1923	1.2	2.4	4.3	4.3	0.8	0.6	0.6	0.8	5.5	0.6	1.9
1924	1.15	2.14	2.02	3.41	0.72	0.60	1.20	0.65	5.11	0.50	1.86
1929	1.10	2.15	3.68	3.95	0.34	0.36	1.38	0.54	3.79	0.86	1.71
1930	1.1	2.3	3.1	3.2	0.3	0.4	1.2	0.5	3.0	0.8	1.8
Employed—											
1923	1.1	2.4	4.3	3.9	0.7	0.7	0.3	0.8	5.3	0.6	1.8
1924	1.12	1.87	1.92	3.17	0.66	0.54	1.06	0.56	6.15	0.44	1.78
1929	1.07	2.03	3.95	3.85	0.28	0.25	1.23	0.54	3.76	0.36	1.65
1930	1.1	2.2	3.4	2.9	0.3	0.4	0.9	0.5	2.7	0.3	1.8
Unemployed—											
1923	1.7	2.2	5.6	6.3	1.5	0.5	2.0	0.7	7.0	0.7	2.2
1924	1.63	3.82	3.86	5.82	1.57	0.99	2.22	0.76	4.84	0.95	2.49
1929	1.64	3.62	3.14	7.19	1.69	1.07	2.80	0.51	6.40	0.37	2.47
1930	1.1	3.1	6.9	4.9	1.3	0.4	2.9	0.5	4.9	0.4	1.7

Taking the groups singly, the points which they reveal may be catalogued thus:—

Group A.

(1) There has been a decline in the proportion of insured workers domiciled in the Survey Area in General, Electrical, Marine, and Constructional Engineering.

(2) The greatest reduction has taken place in Marine Engineering, from 42.9 per cent. to 36.5 per cent.

(3) In Stove, Grate, Pipe and General Iron Founding an increase has taken place, but it is one which shows itself in 1930 only.

(4) Contemporaneous with these movements there has been, however, an increase in the proportion of *employed* workers domiciled in the Survey Area in General Engineering, Electrical Engineering, Constructional Engineering, and over the whole period in Stove, Grate, Pipe, and General Iron Founding.

(5) In Marine Engineering, with the exception of 1930, when the proportion increases slightly on the previous year, there has been in the proportion employed a continuous decline.

(6) The tendency for there to be, as a rule, a bigger proportion of insured workers than employed workers finds expression in a relatively large percentage of the country's *unemployed*, and this is true of all trades in the group.

(7) The result of the movements noted under 1 and 4 has been, however, to cause in some trades a slight decrease over the period in the proportion of unemployed in the Survey Area.

Group B.

1. The outstanding feature is the relatively small proportions of the country's insured workers which this Area contains. Only in Heating and Ventilating Engineering is the proportion near the average for all workers taken together. But the small number it includes (section IIa) makes it negligible.

2. With one exception they all show a decline over the period, Bolts, Nuts, and Rivets alone showing an increase. This, however, is so small both absolutely and relatively that it does not have much importance.

3. The smaller trades show the same tendency as the large trades and in almost every case contain, for a smaller percentage of the country's insured, a larger percentage of the country's unemployed.

Apart from the figures for Marine Engineering these are showings which appear to present reasonably faithfully the Area's position. Their full import can only be appreciated, however, if they are read in conjunction with sections (ii) and (iii) and Tables 1-10 of this part of our Report and the part that deals specially with Labour.

The Survey Area and the Depression.

Some time has already been given to the effect of the depression of 1930. The story can be carried still further, and in illustration of its points a comparison is made below between the Survey Area and Great Britain the data of which are included in one comprehensive table.

In General Engineering the depression has evidently been relatively more severely felt in the Area than in the country generally. The movements of both are in the same direction, but the indices for the Area are much more strongly marked. The index of employment in the Area drops to the lowest point since 1923 and the percentage of unemployment reaches a maximum with 44.0 per cent. Against this latter, the country also reached its maximum but at the much lower figure of 27.6 per cent.

In Electrical Engineering there is a marked contrast. The Survey index of the insured for 1931 continues its upward course but that for Great Britain repeats the index of the year before. Employment falls in the country generally but in the Area increases by one point over 1930, which was itself a maximum. The result is a much greater increase in the country's percentage of unemployment than in that of the Area. Both, however, increase steeply—the country's from 7.4 per cent. to 14.7 per cent. and that of the Area from 8.7 per cent. to 14.8 per cent. and both register their maximum unemployment percentages over the years which we are recording. It is evident though that in the Area "grid" work is having a greater stabilising influence. In Marine Engineering—a relatively depressed industry over the greater part of the period, the heightening effect of the 1930-31 depression is

severe. There are steep falls in employment for both Area and country alike, and steep rises in unemployment. The position may be summed in the percentages of unemployment which—44.8 in Great Britain and 61.0 in the Survey Area—speak only too eloquently for themselves. Their story is one of almost complete stagnation.

In Constructional Engineering and in Stove, Grate, Pipe and General Iron Founding the position is much the same. Employment remains stable in the first, however, as compared with Great Britain for which it falls, and the rise in the unemployment percentage has here to be explained by a continued increase in the number of the insured. In the second, too, the "insured" figure in the Area continues to increase, and diminishing employment again takes its toll in the shape of a steeply rising index of unemployment and a much bigger unemployment percentage.

TABLE 15.—*Index numbers of Insured, Employed, Unemployed and Percentages of Unemployment. N.E. Survey Area and Great Britain compared. (1924 = 100.)*

	Insured.			Employed.			Unemployed.			Percentage Unemployed.		
	1929.	1930.	1931.	1929.	1930.	1931.	1929.	1930.	1931.	1929.	1930.	1931.
General Engineering.												
<i>Gt. Britain</i> ...	93	94	95	99	93	84	59	106	119	8.8	15.7	27.6
<i>Survey Area</i> ...	93	92	87	104	95	66	60	86	173	17.5	24.9	44.0
Electrical Engineering.												
<i>Gt. Britain</i> ...	118	126	126	119	121	114	64	159	339	4.4	7.4	14.7
<i>Survey Area</i> ...	111	121	139	114	131	132	109	106	196	10.3	8.7	14.8
Marine Engineering.												
<i>Gt. Britain</i> ...	88	89	99	95	89	66	51	90	238	8.7	15.2	44.8
<i>Survey Area</i> ...	82	86	79	91	88	39	47	80	221	12.4	20.4	61.0
Constructional Engineering.												
<i>Gt. Britain</i> ...	117	116	117	121	111	97	97	156	253	10.1	16.4	26.4
<i>Survey Area</i> ...	113	110	114	118	99	99	81	177	211	9.7	21.6	24.8
Stove, Grate, Pipe, and General Iron Founding.												
<i>Gt. Britain</i> ...	109	111	111	109	104	92	92	154	246	9.5	15.5	25.4
<i>Survey Area</i> ...	106	118	123	115	119	97	78	113	201	18.2	23.8	40.2

(iii) **New firms started and old firms closed down.**

Some indication of movement both by area and by trade is to be found also in the data relating to new firms started and established firms which have closed down. This data is based on information which has been supplied by the Ministry of Labour and the Inspector of Factories, and relates to all firms which employ, or ordinarily employed, more than twenty workers. While it may not be complete in its cover of these trades and while the figures given are perhaps not absolutely accurate we have no reason to doubt the general validity of the picture they present. We give, it is true, an appearance of accuracy by detailed rather than rounded figures, but this, we submit, is merely following them in their figures. They should be accepted as an approximation and not as a picture arithmetically accurate to the last figure.

We present, first, the movement which appears to have taken place in the General Engineering group. Nine firms are recorded as having started since 1920, and eighteen firms have closed down, the number of workers involved being 594 and 1,860 respectively. Of the nine firms appearing as new, however, four are reorganised units arising Phoenix-like out of the ashes of old concerns which appear also on the debit side of the account in the same category, or are new organisations taking over existing works also recorded on the debit side in the same category.

These four between them account for no fewer than 355 out of the total of 594 workpeople involved, leaving only 239 out of the 594 to be accounted for by firms new in every respect.

Examples of the process which has been at work will make this clear. A firm which appears on the "firms closed" side of this balance sheet was classed as belonging to the Engineers and Brass Founders group and was recorded as having employed 290 workpeople. After its liquidation, a new company was formed for the purpose of making motor cylinders and was recorded as employing 35 workpeople. Another firm was reorganised to carry on the same business as had been carried on by the firm under its old constitution, but is recorded as employing 125 workers instead of 220.

With this interconnection between the two sides of the balance sheet stated, we may present the total number of workpeople involved. 594 workpeople were covered by firms starting, and 1,860 workpeople by firms closed, thus leaving a debit balance of 1,266 workpeople left without work.

In the main, the firms involved on both sides of the account are foundry-men and are situate in the Darlington-Stockton-Middlesbrough region of the Survey Area. Exceptions, however, are to be noted. Two firms, small in numbers but important in the character of their product, have been started in the Newcastle area—one to make motor cylinders and the other special types of bearing, while three on the other side of the account are a Darlington wagon and boiler works, a Durham colliery-plant firm, and a marine engineering works on Tyneside.

These three are important in two respects; firstly they involve more workpeople than the closing of a works ordinarily seems to have meant in this group, and secondly they have been closed for reasons which seem to merit individual record. Taking them in order, the Darlington wagon works employed 160 workpeople and was closed because it had been bought up by another concern which was anxious to eliminate its competition, the Durham colliery-plant firm employed 134 workers and was closed for lack of work, while the marine engineering works involved 370 men, and was closed because the work was being transferred as a result of amalgamation.

In Electrical Engineering the development of new firms is surprisingly small, and movement is at first sight disconcerting. 257 workers appear on the firms started side of the account and 325 on the side of firms closed. This is mainly the result—not of varied activity on both sides as the figures appear to suggest, but of the recent arrangement between a Gateshead firm and a Hebburn firm of electrical engineers under which work has been concentrated at Hebburn. Broadly, the figures just given merely show the book-keeping side of the arrangement and that so far as work done is concerned, Gateshead's loss has been Hebburn's gain. Of the new small firms recorded, none is situated in the south or mid portions of the Survey Area. They are all situate on Tyne-side.

In Marine Engineering, the credit side of the account is blank, while the debit side shows a closure of seven firms with a total of 655 workpeople involved. In the main, the firms are small; in fact relative to the size usually to be found in Marine Engineering, they ought almost all be classed as small. A large marine engineering firm with works in several places in the Survey Area closed a marine engineering department at Middlesbrough in 1930 and makes the largest individual contribution to the total with a figure of 255 workpeople involved. Two South Shields firms come next with 110 and 100 workpeople respectively. The other four contribute 60, 60, 40 and 30 respectively. Their distribution, however, four on Tyne-side involving 310 workers, one on Wearside involving 30 workers, and two on Tees-side involving 315 workers, does not seem to involve a sufficiently large number of cases to make any generalization possible. We content ourselves therefore with merely presenting the record of such data as can be found.

In Constructional Engineering, no great movement has taken place and it seems that the relative activity which, as compared with most other firms outside Electrical Engineering, the Constructional Engineers have experienced has been rather in the form of an expansion of employment in existing firms than in an addition to their numbers. As might be expected then, the numbers involved in the category are slight. A Middlesbrough firm of structural steelwork makers closed in 1923 involving 50 workpeople, while a steel flooring firm began in Stockton in 1925 and employed 40 workpeople. In the Newcastle area, a firm of steel scaffolding erectors was started in 1930 and employed 38 workpeople, while in addition, Messrs. Dorman Long have put into employment a number of men, returned as 41, on the work of erecting the steelwork for the new Dunston-upon-Tyne power station. As this is in the ordinary line of business of Messrs. Dorman Long, and, as by the nature of the work done it can only be temporary in character, we suggest that attention be directed only to the two firms previously mentioned. While the numbers involved indicate that they contribute only relatively little in terms of employment, the nature of the work they are doing makes them interesting, and

maybe even important. They are forms of work on which the future may make an increasing demand, and it is a good sign to see that, in the midst of a depression which has long been settled on the basic industries of the Area, there are firms being launched whose future may be one of expansion and not of the contraction which seems more likely to be the lot of so many others.

This exhausts the categories which we regard as important engineering categories in the Survey Area, but it does not exhaust the changes that have been taking place. In the Brass and Allied Metal Ware Trades a small firm involving 20 workpeople has transferred its activities from Newcastle to Felling, and, more important, a shipbuilding brass founding department employing 70 men has been closed down and the work transferred to a subsidiary company. Two wire-rope makers, one at Heaton, Newcastle, and the other at Sunderland have closed down because of amalgamation leading to the formation of British Ropes, Ltd., and displaced 143 workpeople. A Sunderland carriage builder employing 24 workpeople has closed, and in iron founding, three firms have closed down with the consequent displacement of 321 workpeople, while three firms have started and find employment for 65 workpeople. In each case of closure the reason of slack trade is given. Against these we have three entrants, all small, in iron founding, a radio manufacturing establishment in Newcastle employing 31 workpeople and a new entrant in motor repairs in the form of the United Automobile Services at Middlesbrough. This, no doubt, is a serious under-estimation of the amount of new employment provided in this line but it can be explained perhaps on two counts. In the first place these figures relate only to firms employing more than 20 workpeople and in the second place, much repair work of this kind demanding mechanic's skill, will probably be done in garages and will therefore be returned under a different category. Moreover, most new concerns in this line tend to begin small and to perform service of a general kind. While, therefore, the relative blankness of the record in motor repairs appears to suggest an absence of new comers, it would doubtless be a serious mistake to take it as an indication of entire lack of activity in this line in the Survey Area.

In Railway Carriages and Wagon Making and Repairing the most important entrant recorded is the L.N.E.R. at Darlington with a railway carriage and wagon making and repairing department employing 264 workpeople. Other entrants are a small new shop employing 44 workpeople and a small firm, reorganized after bankruptcy, employing 40.

Finally, in the general and unclassified group of metal working trades, we find that only two firms figure on the entry side of the balance sheet, while five figure on the "firms closed" side. With one exception they are all situated on Tyneside. The exception is a

Sunderland blocksmith, closed in 1924, whose employment figure is shrouded in so much doubt that no figure can be given. All the firms closed were small and their activities were varied, including in their variety, chromium plating, plate milling, brass founding and tin box making. The credit side of the account is made up of a small locksmith employing 20 workpeople and a Newburn-on-Tyne spring making firm which employs 71 workpeople and has been built up out of the closure of a steel works which, using the same site, had up to 1924 employed in the region of 1,500 workers.

With one or two minor additions to the final category given we now summarise all our findings in the composite table given below :—

TABLE 16.—*Firms started and Firms closed in the Survey Area since 1930 (Basis—firms employing 20 or more workpeople; Source—Ministry of Labour and Inspectors of Factories).*

Category.	Number of Workers involved in Firms Started.	Number of Workers involved in Firms Closed.
General Engineering	594	1,861
Electrical Engineering	257	325
Marine Engineering	—	655
Constructional Engineering	81	50
Stove, Grate, Pipe, and General Iron Founding	65	321
Motor Vehicles, Cycles and Aircraft	30	21
Carriages and Carts (Railway Carriages, etc.) ...	348	64
Electrical Wiring and Contracting	—	—
Electric Cables and Lamps	31	—
Hand Tools and Cutlery	—	—
Bolts, Nuts, and Rivets	—	—
Brass and Allied Metal Ware	20	70
Heating and Ventilating Engineering	—	—
Watches and Clocks	—	—
Metal Trades not Separately Specified	59	143
Total	1,485	3,509

It is clear from this that new activity begun is much less in the Survey Area than old activity shut down, and that Marine Engineering presents this principle in its completest form. Further if it were not for the new venture of the L.N.E.R. at Darlington and certain promising and interesting ventures such as the new patent bearing works, the motor cylinder works, the steel flooring and steel scaffolding firms, and the newly formed spring making works at Newburn-on-Tyne, the general picture would be one from which nothing but pessimism could be bred.

It is further evident from these figures that the Survey Area is not entering as greatly as other parts of the country onto those new industries—electrical engineering of the lighter kind, electric cable and lamp making, motor making, motor engine making and repairing—in which the greatest expansion is being made and the

growth of which would do so much to correct that over-emphasis on certain basic industries which is the root cause at the present time of much of its economic and social trouble. Finally, it is again clear that apart from the venture of the L.N.E.R. at Darlington and certain firms in motor cylinder work it is on Tyneside that the greater part of such activity as can be recorded is located.

(iv) Production in Engineering on the North East Coast.

Figures relating to production in Engineering are conspicuous either by their absence or their dubiousness.

In the first place, the official source of information, the Board of Trade, can provide information only for the year 1924 and then (see Appendix VII) in a form which, because of the way in which various categories of Engineering are grouped together, makes comparison with employment or comparison with other areas almost an impossibility. In the second place, recourse to the export figures is prohibited by the aggregating of almost all forms of machinery exports from the North East Coast under the general heading of "Machinery". Of all the engineering trades on the North East Coast it is possible to isolate in this way the figures for locomotives only. The way is thus barred—except in this one instance—to the device of finding, by questioning business men, the normal proportion between home and export orders, applying this factor to the exports recorded and thus obtaining a rough index of production. Finally, in the other case in which, this time from an unofficial source, statistics of production are obtainable, namely, in Marine Engineering, it is unfortunate that there is a serious clash between the various data showing employment which makes only the broadest of conclusions possible.

With these somewhat pessimistic warnings in mind we may turn to an examination of such comparison as seems possible between the United Kingdom figures of production and those of the North East Survey Area as given by the Census of Production of 1924.

Two points only need detain us, firstly, the method of compilation and, secondly, conclusions which may be drawn from them; the complete set of figures is given, if fuller examination is required, in Appendix VII.

The method adopted has been to note the way in which the data had been aggregated for the North East Survey Area in the abstract specially made for us by the Board of Trade, and then to take out from the final volume of the 1924 Census of Production the individual trades mentioned and aggregate them in the same way.

The broad features of the table are that in Mechanical Engineering which includes Marine Engineering, the Survey Area takes 6.81 per cent. of the net output of the country and 7.85 per cent.

of the persons employed. The tendency of this Area to use mainly male labour is also revealed by the fact that whereas the Area takes 8.07 per cent. of the total males employed, it takes only 2.3 per cent. of the females. The Survey Area has a smaller net output per head with £163 per head as compared with the figure £192 per head for the United Kingdom, which means that the value of the output per head in the Area is only 84.9 per cent. of that for the country as a whole.

In Metals other than Iron and Steel the Survey Area takes 1.46 per cent. of the net output of the country with 1.61 per cent. of the total employed, and a net output per head which is only 91 per cent. of that of the United Kingdom. In other trades, including light castings, anchors, chains, hardware, railway carriages, electrical engineering, to name only the more important, the Area has 1.76 per cent. of the country's net output with 1.65 per cent. of the persons employed giving an output per head roughly equal to that of the country. If all classes are aggregated then the Area shows a net output per head of £175.8 as compared with the country's net output per head of £208.2.

We do not venture to make more than the most general of comments on these figures for clearly they do not provide sufficient basis for more than this. It does not seem to be going beyond the limits of reasonableness, however, to note that the characteristics of the Survey Area as shown by these data seem to be—(i) a strong concentration upon the major or more basic metal-working categories; (ii) a strong concentration upon male labour rather than upon female labour; and (iii) a tendency for the value of its product to be less than that of the country as a whole for a given quantity of labour. Points (i) and (ii) are confirmed by the alignment shown in the Insurance statistics, while point (iii) which, of course, is not completely or even necessarily proved by the data given here is confirmed, it would seem, by the low value per ton of the exports from the Survey Area as compared with the value per ton of the exports from the country as a whole.

We report these findings without further comment. We would add, however, that any measure to increase either official knowledge or trade knowledge of the trend of production in the different sections of engineering would be one which we should welcome.

Turning to a second point it is generally held that the relation between exports and production in engineering is as 25:100. In support of this we may quote Mr. A. Bremner who, in giving evidence before the Balfour Committee, stated that a census taken by the Engineering and Allied Employers' National Federation revealed 73.5 per cent. of orders for the home account and 26.5 per cent. for foreign account.

In locomotive engineering the foreign ratio appears to be higher. One competent authority has placed it as high as 90:100 while

another gave it as 80 :100. In any case the ratio is sufficiently high to make it possible to construct an index number showing the trend of locomotive exports and take this as broadly indicative of trends in production.

It would seem from this that a ratio of 25 :100 might be applied to exports of general machinery and that the exports of locomotives might be given as they stand. Enquiry amongst business men has revealed, however, a further difficulty. Of 24 firms who were classed as General Engineers and who constitute between one-third and one-half of the membership in this group of the North East Coast Engineering Employers' Association, 12 stated that their work was entirely, or almost entirely, on the basis of home orders, seven stated that their percentage of foreign orders was 10 per cent. or less. Three only stated that the greater part of their product was for abroad and of these two were entirely connected with railway work while the other does a considerable amount of railway work. Finally, two stated that their ratio of home to foreign work was roughly fifty fifty, and of these one stated that since the end of the War the proportion had varied considerably with the result that the proportion of export work had fallen.

There is no reason to believe that these firms are any other than a fair sample of the general engineering firms of this Area and this being so it would clearly be an invalid proceeding to use the factor 25 :100, which, true enough maybe for the country as a whole, seems to be altogether beside the mark for the firms of the Survey Area.

We are left, therefore, with the exports of locomotives only, and, in values, they run as follows :—

Values of locomotives and parts exported from N.E. Area in £'s and an index of their movement.

(1924=100.)

1920	1921	1922	1923	1924	1925
848,052	1,701,332	2,523,200	1,129,548	471,952	493,342
179	360	535	240	100	104
1926	1927	1928	1929	1930	
1,105,785	652,926	755,486	1,100,352	806,972	
235	138	160	233	170	

This gives us roughly an average of 220 and on this showing production, though displaying a recovery since 1924, is not so high in the later part of the period as in the earlier part. This, however, is in terms of a changing pound. The index deflated according to the Board of Trade index with 1913 as its base gives us the reading :—

Index of Locomotives exported from N.E. Area deflated: basis—Board of Trade Index of Wholesale Prices.

(1913=100.)

1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
57	184	337	151	60	66	157	98	114	170	136

Using the same indicator of production for the country as a whole, we find that the trend of the United Kingdom's exports of locomotives and parts of locomotives gives us the reading:—

Values of locomotives and parts of locomotives exported from the United Kingdom.

£000's.

(1924=100.)

	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
Values ...	7,062	9,553	6,454	4,028	2,496	3,250	3,622	2,890	4,666	5,268	4,983
Index ...	282	382	258	161	100	130	145	115	187	211	199
Deflated.	90	229	163	101	60	82	87	82	133	154	76

The two deflated index numbers may now be placed together.

Exports of locomotives and parts of locomotives; United Kingdom and N.E. Area compared: index numbers 1924=100; deflated by Board of Trade Index of Wholesale Prices.

(1913=100.)

	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
U.K.	90	229	163	101	60	82	87	82	133	154	76
N.E.	57	184	337	151	60	66	157	98	114	170	136

Such pointers, however, useful enough to show the variation of what may be termed the competitive locomotive engineering group, are unfortunately no guide to the real trend of locomotive production in this Area. The Survey Area is an important centre for the L.N.E.R. and the production trends previously given give them no place for their work finds no expression in the export returns. The only fact that can be stressed is the similarity of movement they broadly display.

We are thus thrust back upon the statement with which we began. The production figures available are so scanty, or so patchy in their application that no valuable generalisation can be attached to them.

We may turn therefore to our third source, namely, the annual statement of "Indicated Horse Power" aggregated for different marine engineering firms by the "Glasgow Herald" in December of each year.

The figures in their entirety are given in Appendix VIII. It will be sufficient to give here only those portions which relate to the North East Coast, and such other data as are useful in the making of comparisons.

The production they attribute to the North East Coast is as follows:—

TABLE 17.—*I.H.P. Allocated to the firms of the North East Coast.*
Source: Glasgow Herald Annual Supplement.
(000's).

Area	1913	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
Tyne ...	522	635	353	283	189	129	204	178	275	203	483	396	458
Wear ...	198	164	127	63	47	35	91	55	23	113	118	109	112
Tees ...	187	175	202	134	69	48	110	72	24	114	111	156	72
Total N.E. Coast	908	974	682	480	304	212	406	305	322	430	712	661	642
U.K. ...	2,661	3,242	1,700	1,319	816	539	1,104	1,040	1,034	1,343	1,908	1,873	1,880
Percentage of U.K. work done on N.E. Coast.	34.1	30.0	40.1	36.4	37.3	39.3	36.8	29.3	31.1	32.0	37.3	35.3	34.0

And this, cast into the form of index numbers, gives us the following:—

TABLE 18.—*Index Numbers of I.H.P. Production Attributed to N.E. Coast by the Glasgow Herald Supplement.*

Area	1913	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
(1924 = 100.)													
Tyne ...	256	311	173	139	93	63	100	87	135	99	237	194	225
Wear ...	217	180	140	69	52	38	100	60	25	124	130	120	123
Tees ...	170	159	184	122	62	44	100	65	22	104	101	142	65
Total ...	224	240	168	118	75	52	100	75	79	106	175	163	158
U.K. ...	241	294	155	119	74	49	100	94	94	122	173	170	171

It is clear that there is a decline from the high level of North East Coast production of 1913 and 1919 but if the average of the years 1919 to 1924 inclusive be compared with the average of the subsequent six-year span namely, 1925-1930 inclusive, then it is seen that the two periods return almost the same figure—an index of 126. Against this, the index showing the total of English production (see Appendix VIII) presents much the same general features of a decline from an early high level and then, in the later post-war period, recovery after a period of decline. In addition it registers an average of 131 for the period 1919-1924 inclusive as compared with an average of 147 for the later period. The inference clearly seems to be that while there is no marked difference between the post-war trend pursued by the Area and the country, the Area does not present the same recovery as the country. This seems to find confirmation in the fact that the average proportion of English work done on the N.E. Coast during the period 1919-1924 inclusive was 72.4 per cent. whereas during the period 1925-1930 inclusive it was only 62.8 per cent. A comparison of production on the Clyde and for the United Kingdom as a whole for the same two periods shows that the Clyde experiences a slight decline with an average of 133 for the years 1919-1924 inclusive and an average of 131 for the years 1925-1930 inclusive.

The position of the United Kingdom is rather different. An average for the period 1919-24 of 132 is followed by an average of 137 for the period of 1925-1930. It would seem from this that while the English and United Kingdom figures indicate that a recovery has been made in the late post-war period from the decline of the early and mid post-war period—1919 excepted—in which the Clyde and the N.E. Coast have shared, it is also true that the older established centres of production have not recovered sufficiently to take them above their average of production for the first part of the period while the country as a whole has.

This matter of the proportion of the country's work which is done in the Survey Area is perhaps worthy of more detailed notice. And while, in our opinion more detailed notice would have clogged the argument of earlier sections, it may not be altogether out of place here treated separately. We may begin by using some of the figures given in Table 17. They show that the proportion of English work done on the N.E. Coast for the period 1913, 1919-1930 inclusive and the proportion of the work of the United Kingdom taken by this Area are as follows :—

Proportion of work done on the N.E. Coast, in percentage form.

	I.	II.
	<i>As compared with England.</i>	<i>As compared with the United Kingdom.</i>
1913	65	34
1919	67	30
1920	71	40
1921	66	36
1922	80	37
1923	78	39
1924	73	37
1925	56	29
1926	61	31
1927	70	32
1928	64	37
1929	67	35
1930	59	34

If the median proportion be taken, and the successive years grouped accordingly as they are above or below the median, then the position of the Area relative to England gives us the following placings. The median is 67 per cent.

1913	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
		71		80	78	73			70			
65	67		66				56	61		64	67	59

And the placings relative to the United Kingdom with a median of 35.5 per cent. are :—

1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
	40	36	37	39	37				37		
30						29	31	32		35	34

The record on a proportion's basis is thus better in the early post-war period than in the later post-war period, and it seems clear from these placings that while a degree of recovery has been made from the setback which occurred after the collapse of the post-war boom, it has not been quite sufficient to restore the work of the N.E. Coast to its old proportion or to the average post-war proportions relative to England and the United Kingdom.

Before leaving the question of Engineering production, however, it is desirable to notice what seem to be a number of important features including some persistent changes which appear to be taking place within the Survey Area as regards the distribution of the work it does. The first is the commanding position held by the Tyne, the second is the strong and more sustained recovery which it makes in the latter part of the post-war period relative to the Wear and Tees, and the third is the division of the total output of the Area between firms which are specialist marine engineers and firms which are also shipbuilders. Taking these points in order over the period 1919 to 1930 the proportion of the N.E. Coast work done on the Tyne appears to increase. The individual years run as follows:—

TABLE 19.—*Proportion of N.E. Coast Production (I.H.P.) done by Tyne.*
000's.

Area	1913	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
Tyne ...	522	635	353	283	189	129	204	178	275	203	483	396	458
N.E. Coast	908	974	682	480	304	212	406	305	322	430	712	661	642
Percentage of Tyne to N.E. Coast	57	65	52	59	62	61	50	58	86	47	68	60	71

An average of roughly 58 per cent. for the first half of the period thus gives place to one of roughly 65 per cent. for the later half of the period. In confirmation of the second point the Tyne shows both strength and persistence with an average index of 150 for the period 1919-1924 inclusive, and an average of 163 for the period 1925-1930 inclusive, while of the other two rivers the Wear with an average of 96 for both periods fails to rally, though it is true its last four years (see Table 18) finish relatively strongly. The Tees, with an average of 112 for the period 1919-1924 inclusive, and an average of 86 for the period 1925-1930 inclusive falls back—the fall being due to the fact that in one year only, 1929, does its output rise appreciably over 1924, and in 1926 and 1930 it diminishes to the very low level of 22 and 66 respectively.

The confirmation of the third point appears from a consideration of the figures of Table IX in the Appendix. The tendency is clearly for a greater proportion of work to be done by what we may term the combined firm. Comparison with the pre-war position is, seeing that we have only one year recorded, hardly appropriate, but the post-war tendency is for the annual proportion never to fall

to the 1913 level in any year and to finish with a proportion for the latter part of the period higher than a post-war average already high.

(v) Foreign Trade.

In presenting our findings in this section, we deal first with the import trade and then with the export trade. We use the official figures of the Annual Statements of Trade of the United Kingdom and supplement these with figures obtained from the annual reports of the Tyne Improvement Commissioners. Foreign trade figures for the other two rivers are not sufficiently sub-divided to show the extent of their trade in machinery and other metal products, but since it appears from other findings that the Tyne is a representative of all classes of engineering activity except constructional engineering the loss is not as serious as it might at first sight appear.

(a) *Import Trade.*

The characteristics of the import trade of the Area may be grouped under three heads. Firstly, we may take the proportion of trade which is done year by year in the Area relative to the country as a whole, secondly, the actual variation year by year in the trade of both country and Area, and thirdly, the division of the Area's trade between the different points of import within it.

And for this purpose the total imports into the Area may be divided into two groups, machinery in the one group and vehicles in the other.

From the figures given below and in Table XI in the Appendix it is at once clear that the proportion of the country's import trade in these classes of goods has at no time been great. On the basis of values the Area imported, in 1920, 0.9 per cent. of the total machinery imported into the United Kingdom and 0.8 per cent. of the vehicles. In the mid post-war period, e.g. at 1925, the figures were 1.6 per cent. for machinery and nil for vehicles, while at the end vehicles again recorded a blank and machinery imports maintained their tendency to increase and recorded 3.7 per cent. The tendency of the Area's import trade may thus be summed up in two phrases—vehicles imports disappear and machinery imports increase. This is brought out more clearly if a five year average be taken. It is then obvious that the machinery imports proportion of 3.7 per cent. in 1929 is not abnormal but is consistent with the tendency which can be seen to be developing over the whole of the post-war period. The average for the years 1920 to 1924 inclusive is 1.0 per cent. As is shown below, the average for the years 1922-1926 inclusive is 1.24 per cent. and that for the years 1925-1929 inclusive is 2.14 per cent.

Proportion of the United Kingdom's Imports in Machinery recorded at the Ports of the N.E. Coast Survey Area.

Year.	1920-1929 inclusive. Proportion imported into the N.E. Area. percentage.	Five year average.
1920	0.9	
1921	0.7	1920-1924=1.0 per cent.
1922	1.6	
1923	0.9	
1924	0.9	1922-1926=1.24 „
1925	1.6	
1926	1.2	
1927	2.4	
1928	1.8	1925-1929=2.14 „
1929	3.7	

Average of all years=1.57 per cent.

It remains now to show whether these proportions for the Survey Area represent a real increase in trade or not and it is therefore necessary to examine the trend of imports for the country and the Area over the period.

This introduces a difficulty not before encountered for two alternatives present themselves. The trade may be shown in terms of values, or alternatively it may be shown in terms of tonnage. If the former be chosen then difficulty is created by the change in the value of money over the period. If the second be chosen then difficulty is created by the fact that for the N.E. Coast trade in vehicles only values are available.

The first of these alternatives is evidently the better, seeing that it is more inclusive, but it involves us in deflating the index of the trend of trade by reference to the Board of Trade index of the trend of prices without knowing how precisely the general change in the value of money is reflected in the prices of machinery.

We must stress therefore that the correlation given below can be interpreted only in the broadest possible way.

TABLE 20.—*Imports of Machinery into the U.K. and the Survey Area compared.*
(£000's.)

	1913	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
U.K.	7,267	15,020	19,961	10,762	8,170	9,332	10,546	11,900	12,740	15,919	16,738	19,138	17,913
N.E. Coast Survey Area.	51	35	183	79	127	83	91	188	155	368	306	712	528
Index of U.K. Im- ports 1924=100	69	142	189	102	77	88	100	113	121	151	159	181	170
Index de- flated to 1913 values.	69	54	62	52	49	56	60	72	82	106	114	133	141

Indubitably, however, it is evident from this that from 1922 onwards the real volume of the United Kingdom's import trade in machinery has been increasing. The N.E. Coast, therefore, has been doing a bigger proportion of a total which has itself been expanding. And this is confirmed equally beyond doubt if index numbers are prepared on a tonnage basis.

Imports of Machinery into the United Kingdom and the N.E. Coast expressed as variations of 1924.

1924 Tonnage = 100.

	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
U.K. ...	149	91	76	90	100	122	133	170	158	188	178
N.E. } Survey Area }	155	55	88	63	100	216	234	495	406	865	663

On the vehicles figures we need spend only the briefest of time. The N.E. Coast ports give no record of this kind of trade completely while the figures of the United Kingdom between 1924 and 1929 slightly increased.

Under the third heading, namely that of the division of the import trade between the different importing points in the Area, the important feature is the entry into the field of Stockton and Middlesbrough.

Up to and including 1924 the Tyneside ports alone are concerned in import trade. Both for vehicles and for machinery the import returns of other ports are blank. With 1925, however, is introduced an important change. From this year onwards the import trade in machinery is shared between the Tyne ports, Stockton and Middlesbrough. And the share taken by the newcomers shows rapid growth; 1.6 per cent. and 0.53 per cent. in 1925 for Middlesbrough and Stockton respectively, it grows to 40 per cent. for Middlesbrough and 4.4 per cent. for Stockton in 1929, as against the 56 per cent. for the Tyne ports in the same year.

(b) *Export Trade.*

We adopt the same plan in presenting the figures of the export trade in engineering products as was adopted for the import trade. The more detailed division of the data in the Board of Trade returns enables us to have three classes instead of only two. These are machinery, locomotives and parts of locomotives, and carriages and wagons and parts of carriages and wagons. Further, we adopt the same threefold presentation.

Accordingly we begin with the export trade in machinery and show the proportion of such trade which year by year has been

done from the Survey Area. The following tabulation gives a comprehensive picture of the position :—

Proportion of Export Trade in Machinery done from the N.E. Survey Area.

Year.	Values.			Average.
	Percentage.	
1920	2.5	1920-1924 inclusive = 1.92 per cent.
1921	2.2	
1922	1.3	
1923	1.4	
1924	2.2	1922-1926 inclusive = 1.6 per cent.
1925	1.9	
1926	1.3	
1927	1.9	1925-1929 inclusive = 1.76 per cent.
1928	1.8	
1929	2.0	

Average for all years = 1.84 per cent.

Over the period the Survey Area's average annual share of the machinery exports of the United Kingdom is thus 1.84 per cent. If the year 1926 be omitted then the average, not greatly higher, is 1.9 per cent. And broadly the inference from these figures is that the N.E. Coast is just, but only just, maintaining its average proportion, though there are some signs, particularly in the later part of the period, on which a slightly more comforting conclusion could be based. To examine them more closely a decline in the mid-war period to a five year average below the average for the whole period is followed by a recovery to a figure which for three out of the last five years so taken is *above* the average for the period and which for all the last five years taken together is just less than the average for the period. Never much below the average for several years together, only below the average in the last five years in 1926 which may be excluded as being abnormal, the trend clearly shows a stronger finish for the Survey Area than the mid post-war period would lead us to expect.

As before, we must now examine the nature of the trade variations on which these proportions are based.

The exports of machinery from the United Kingdom were, on a values basis, as follows, and the following table gives, in addition to the actual values recorded, an index of their values deflated according to the Board of Trade index of general prices with 1913 as its base :—

TABLE 21.—*Exports of Machinery from the United Kingdom.*
(£000's.)

	1913	1919	1920	1921	1922	1923	1924	1928	1926	1927	1928	1929	1930
Values of Exports.	33,603	30,742	63,458	74,607	51,539	44,509	44,783	49,053	45,378	49,921	53,722	54,351	46,928
Index No. of Values 1924=100.	75	69	142	167	115	99	100	109	101	111	120	121	105
Index No. deflated to 1913 values.	75	26	46	85	72	63	60	69	69	78	86	88	87

It is evident from this that with the exception of 1921 the export trade of the United Kingdom is, up to 1927, below its pre-war volume. It is equally evident that from 1927 onwards its trade is *above* the pre-war volume, and, recalling the proportion of this trade done from the N.E. Coast, it is clear that its proportion makes its late post-war recovery precisely when the national figure is out-topping its previous post-war level and also that of 1913.

The whole position may be summed up in two important phrases. Firstly, the Area, so far as machinery export goes, holds it own, and, secondly, during a period when the trade of the country as a whole is increasing, makes a sustained recovery from decline.

We turn now to the way in which this trade is shared by the different points of export within it. The position in its entirety is given in Table XIII in the Appendix. Here it is sufficient to give only the salient features of this distribution.

Firstly we may note the disappearance of exports after 1924 from Blyth and Stockton; secondly, that the trade of Sunderland and the Hartlepools tends to be both small and erratic, and finally, that machinery exports seem to be mainly a matter for the Tyne ports and Middlesbrough.

The main trade is with these two in all the years recorded, and the question of its division ultimately resolves itself, therefore, into the question of the relative shares of these two only. Up to and including 1925 Middlesbrough, with usually one-fifth more trade, is clearly the more important partner. In 1926, however, the gap is narrowed. In 1927 the Tyneside ports assume the senior partnership. They lose it by a narrow margin in 1928, but regain their lead by a greater margin in 1929.

The position may be summed up in terms of the figures of machinery exports recorded by them in 1920 and 1929 respectively. In 1920 Middlesbrough was responsible for exports valued at £671,820, and Tyneside for exports valued at £546,533; in 1929 Middlesbrough recorded £436,617 and Tyneside £580,796. Disregarding for the moment the fact that, in values, the total trade by the Area as a whole is less, it is clear that what has happened has been a reversal of their 1920 relationship and a change of place one with the other.

Export trade in locomotives and parts of locomotives.—The share of the United Kingdom's export trade in locomotives which is taken by the Survey Area is, as might be expected, far greater

than that in general machine products. It is, however, as the following table shows, far more erratic :—

Proportion of the United Kingdom's Export Trade in Locomotives and Parts of Locomotives taken by the N.E. Survey Area.

Year.	Values.			Percentage Proportion.	Averages.
1920	12.0	
1921	17.8	
1922	39.1	1920-1924 inclusive = 23.1 per cent.
1923	27.9	
1924	18.9	
1925	15.2	1922-1926 inclusive = 26.3 per cent.
1926	30.5	
1927	22.6	1925-1929 inclusive = 21.1 per cent.
1928	16.2	
1929	20.9	

Average for all years = 22.1 per cent.

There is here a reversal of the trend shown by the classes of general machinery discussed in the preceding section. A strong mid post-war span, well above the average, is followed by a decline for the next, and third, five-year span which is not only below the average for the whole of the post-war period, but is also below the average for the first five-year span of the post-war period. No attempt has been made so far to eliminate the figure for 1926, but clearly the case for such elimination cannot reasonably be made. 1926, with a proportion of 30.5 per cent., is second in the list; and the explanation of the weak average of the last five-year span lies hidden in the two exceptionally weak export years of 1925 and 1928. But before comment can be made on this, it is necessary to examine what has been the trend of actual export. This is done in the following table :—

TABLE 22.—*Export of Locomotives from the United Kingdom and the Survey Area Compared.*
(£000's.)

	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
Values of Ex-ports from U.K.	7,052	9,553	6,454	4,028	2,496	3,250	3,622	2,890	4,666	5,268	4,983
Values of Ex-ports from the N.E. Survey Area	848	1,701	2,523	1,130	472	493	1,106	653	755	1,100	807

And these expressed as index numbers and placed together are :—

	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
U.K. ...	283	383	258	161	100	130	145	116	187	211	200
N.E. Survey Area	180	360	535	239	100	104	234	138	160	233	171

which, deflated to 1913 values are :—

	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
U.K. ...	90	229	163	101	60	82	87	82	133	154	76
N.E. Survey Area	57	184	337	151	60	66	157	98	114	170	136

Trade in general in the post-war period has thus slightly declined, though the years 1928 and 1929 show a strong ability to recover. The trends of trade for the country as a whole tend, though with more exaggeration, and occasionally as in 1923 not at all, to be reflected in the trend displayed by the figure for the Survey Area.

As regards the division of the export trade in locomotives between different parts of the Survey Area, this beyond any doubt is between Middlesbrough and the Tyne. No other port contributes any export returns throughout the whole of the period. The division over the period is, as was the case with general machinery products, subject to variation. As the following figures show, and as a glance at the more detailed table given in the Appendix will prove, the share which goes to the Tyneside ports increases. The average annual amount exported in the period 1920-24 inclusive was £1,334,817 and of this Middlesbrough exported 41 per cent. and the Tyne ports 59 per cent. In comparison with this the average annual amount exported in the period 1925-1929 inclusive was £821,578, and of this Middlesbrough was responsible for only 32 per cent. while the share of the Tyneside ports had increased to 68 per cent.

We complete this section of our examination of the foreign trade in engineering products by giving the export trade in carriages and wagons. As before we begin this by giving a comprehensive table which shows the way which in the post-war period the Survey Area's proportion of this trade has varied :—

Proportion of United Kingdom Export Trade in Carriages and Wagons taken by the Survey Area.

Year.	Values.			Averages.
	Percentage Proportion.			
1920	15.2	1920-1924 inclusive = 8.2 per cent.
1921	8.6	
1922	3.8	
1923	5.0	
1924	8.6	1922-1926 inclusive = 6.0 per cent.
1925	4.2	
1926	8.3	
1927	2.6	1925-1929 inclusive = 5.7 per cent.
1928	4.8	
1929	8.4	
Average for all years = 6.95 per cent.				

Two features at once command attention. Firstly, the variation from year to year is clearly most erratic; almost every year displays a relatively pronounced variation. Secondly, it is evident, however, that the proportion of trade done by the Survey Area, has, if longer periods than the year be taken, steadily declined. The average proportion for each of the last two five-year spans is less than that for the first, and the last five-year span of all is still less than the second. Both are below the general average proportion for all years taken together.

The unfavourable position of the Survey Area relative to the country as a whole which is indicated by these figures is confirmed

when we turn to the figures which show the actual amount of trade which has been done.

The variation year to year of the amounts in values together with an index for each is given in the following table :—

TABLE 23.—*Exports of Carriages and Wagons from the United Kingdom and the Survey Area compared.*
Values (£000's).

	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
United Kingdom	7,405	7,576	5,368	4,155	4,443	5,387	5,465	6,285	5,564	4,816	5,022
N.E. Survey Area	1,123	655	207	207	380	224	455	161	269	405	96
<i>And these put into index form are :—</i>											
	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
United Kingdom											
Index 1924=100	167	171	121	94	100	121	123	141	125	108	113
Deflated to 1913 values	...	54	87	76	59	60	77	82	101	89	80
N.E. Survey Area											
Index 1924=100	296	172	54	54	100	59	120	42	71	107	25
Deflated to 1913 values	...	94	88	35	35	60	37	80	30	48	77

Relatively better in 1920, but much worse relatively in 1922, 1923, 1925, 1927 and 1928, the general position of the Survey Area is clearly one towards decline. It is true that 1929 shows a rapid spurt upwards to a figure well above the average proportion for the period and to a point well above that given for 1924, itself a relatively good year in this section, but the general record over the period is one of such erraticness and relative weakness that no weight can be placed upon it.

The final word seems to rest with the averages and their claim to this final word seems to be clinched when they make it clear that whereas the average annual export of the period 1925-1929 inclusive was, in the Survey Area only 60 per cent. of the average annual export of the period 1920-24 inclusive, the average annual export of the United Kingdom for the period 1925-1929 inclusive had diminished only to 95 per cent. of the average for the first period.

In this case the question of the division between the different portions of the Survey Area does not arise. Middlesbrough is the only port for which such exports are returned. It is not entirely irrelevant, however, to note that the erratic movement of the annual proportion is due not so much to the behaviour of the exports of the country as a whole but to the movement of the exports from the Survey Area.

It appears therefore that the N.E. Coast is, on an average, responsible for 1.84 per cent. of the United Kingdom's export of machinery, 22.1 per cent. of its export of locomotives, and 6.95 per cent. of its export of carriages and wagons, that these averages mask important trends not altogether favourable in some instances to the Area, and that, in the division of the export trade between the different parts of the Survey Area there is a tendency, on balance, towards the Tyne ports and away from the Wear and Tees.

(c) The Trade of the Tyne.

It is unfortunate that no more detailed classification than this is available. Particularly so with regard to machinery, since here, lacking as we do a year to year index of output, insight might be gained into the nature of the changes which are taking place in the proportions in which different classes of machinery enter into the total. Some light, at least, however fitful, is thrown by the figures published annually by the Tyne Improvement Commissioners showing the trade of the Tyne ports. As it is already clear that the Tyne is important in a truly representative sense of all trade except that in carriages and wagons, this source is obviously one which cannot be disregarded.

The figures which they provide are important in two respects. Firstly, they detail the various kinds of engineering product entering into international trade and secondly, they classify these different classes under the countries with which either as exports or imports, they are connected. They thus show the countries from which competition is severest and those which constitute our markets.

The following table presents the imports and exports of the Tyne in summary form:—

TABLE 24.—*Exports from the Tyne in tons.*

	1924	1925	1926	1927	1928	1929	1930
Steel Castings	34	175	42	13	5	10	80
Steel Forgings and Manu- factures.	2,039	2,201	2,661	733	1,315	2,731	1,140
Guns, Armaments	183	247	485	1,613	384	42	1,619
Iron Castings	10,468	9,678	9,271	9,015	13,557	10,670	6,177
Machinery	10,547	10,715	24,091	9,474	8,903	10,766	10,938
Hydraulic Machinery	(Included under Machinery until 1926).			123			
Locomotives and Loco- Tenders.	(Included under Machinery until 1926).			4,698	7,568	6,295	3,718
Anchors and Chains	1,350	752	439	534	376	924	714
Bolts, Nuts, Nails, and Iron- work.	971	1,096	879	1,404	1,759	1,528	2,463
Bridge and Girder work	12	13	402	326	1	9	—
Totals	25,603	24,877	38,270	27,933	33,868	32,975	26,849

TABLE 25.—*Imports into the Tyne in tons.*

	1924	1925	1926	1927	1928	1929	1930
Steel Castings	321	87	134	259	120	481	334
Steel Forgings and Manu- factures.	7,678	3,362	1,608	5,824	3,029	3,879	4,284
Iron Castings	760	651	1,292	1,109	1,376	1,314	2,860
Machinery	2,534	5,149	3,620	5,631	7,066	9,081	7,915
Iron Forgings and other Ironwork.	5,387	8,209	6,511	7,968	6,871	5,644	3,761
Nails, Nuts, Bolts, and Screws.	—	—	—	2,831	3,292	3,471	3,227
Totals	16,680	17,458	13,225	23,622	21,754	23,870	22,381

Taking imports first, it is evident that in spite of year to year variations, the general tendency is one of increase. Taking 1924 as a base they have increased, up to and including the year 1930, in the ratio 100, 105, 79, 141, 130, 143, 134. And behind this general increase it is seen that the categories mainly responsible are iron castings and machinery. Machinery, for example, has increased in the ratio 100, 204, 143, 223, 279 and 394, a steadier and also much more advanced increase than that recorded for the imports taken together.

In the main, the imports of iron castings originate in Holland, which, sending the modest sum of a ton in 1924 has advanced fairly steadily to round about 900 tons by 1929 and in 1930 is responsible for no less than 2,534 tons. No other source is important, and over the period all others show a relative decline, though midway in the period, namely in 1925, 1926, and 1927 a considerable increase takes place in the exports from Belgium.

The increase in machinery imports is mainly accounted for by increases in the coastwise imports, which go up from 1,281 tons in 1924 to 2,479 tons in 1930, by an increase in the German tonnage from 178 tons to 1,967 tons, and a steady increase in Dutch tonnage from 274 tons to 1,091 tons. There is also a remarkable variation in the tonnage from Denmark which, after relatively small figures in 1924, jumps in 1925 to 1,797 tons and after a period of further low tonnages jumps in 1930 to 1,221 tons. Such variations however cannot be regarded seriously in view of the low tonnage figures generally involved and they do not mean the same thing in terms of year to year trade as the steady thrust upwards of the German and Dutch figures.

Turning now to the export trade it is clear that the trend of export trade is neither so regular nor sustained. The main exports are Steel Forgings, Iron Castings, Machinery, Locomotives, and Bolts, Nuts, and Nails. And of these only Bolts, Nuts, and Nails show a sustained increase. The export of machinery, apart from certain strange variations in the years 1926 and 1927, remains roughly steady while the export of steel forgings drops to almost half. There is also a drop of roughly half—more sustained than in the case of steel forgings—in the export of anchors and chains, which, 1,350 tons in 1924, are 924 tons in 1929, 714 tons only in 1930, and in the years 1926, 1927 and 1928 touch only 439, 534 and 576 tons respectively.

We may turn now to the destination of these exports. Coastwise trade is clearly an important factor—in some instances obviously the only factor that counts. In the export of steel forgings, though not steady year by year, it more than maintains its position with 661 out of 2,039 tons in 1924 and 626 out of 1,140 tons in 1930. So far as other markets are concerned, the only centres of importance are the American markets and here there are pronounced falls,

but with such a short period to survey and with the figures so small it is clearly unsafe to attempt any generalisation other than that already made relating to the key position held by coastwise trade.

Of the Tyne's trade in guns and armaments, the bulk is shipped coastwise. 107 tons out of 185 tons were shipped in this way in 1924; and 478 out of 485 tons so shipped in 1926, 1,403 out of 1,613 tons in 1927, 21 out of 42 tons in 1929 and 1,414 out of 1,619 tons in 1930 leave no doubt of the persistence of its importance.

The trade in iron castings which, relatively steady round 10,000 tons annually until 1930, when it sinks to 6,177 tons is, again, mainly a matter of coastwise demand. Norway appears to be our only other customer of importance, taking 966 tons in 1924 and 1,196 tons in 1930 as against a coastwise shipment of 9,266 tons in 1924, and 4,833 tons in 1930. Norway, moreover, appears to be a steadily increasing taker of our iron castings over the greater part of the period.

For machinery customers are more numerous, though again it is clear that coastwise shipment holds a leading place. Its importance indeed grows relatively greater, for, taking 5,527 tons in 1930 as against 1,232 tons in 1924, it redresses the balance for the loss of important consignments made in the earlier years to Algeria, Egypt, Canada, and South America. Trade with all these countries declines, and it is only due to the sustained spurt in coastwise shipments and an increased trade with Holland, Norway and Sweden that the aggregate is enabled to show an increase from 10,547 tons in 1924, to 10,938 tons in 1930. The shipments of anchors and chains show a decrease and it may be wholly attributed to a falling away of the coastwise demand. Only Norway, of other customers, takes a three figure tonnage, but an increase in her takings from 322 tons in 1924 to 543 tons in 1930 is not enough to prevent a decline in the aggregate from 1,350 tons in 1924 to 714 tons in 1930. The remarkable increase in the shipment of bolts, nuts and nails is mainly due to an increase in coastwise shipments from 81 tons in 1924, to 819 tons in 1930, an increase in Norway's demand from 505 tons to 1,168 tons and in Denmark's demand from 83 to 350 tons. No other country takes a total which merits attention and these between them are enough to account for the general increase in this class of shipments from 971 tons in 1924 to 2,453 tons in 1930.

Summing up, it appears that our imports come mainly from Germany, Belgium and Holland, and are found in all classes of import, and that our main customers are the anonymous coastwiser, and the Scandinavian countries. And to this one exception only, albeit an important one, need be made. From 1927 onwards, the locomotive exports from the Tyne are brought out from the obscurity in which, hidden away in the general heading "Machinery," they have up to then been placed.

From 1927 onwards it is therefore possible to discuss the destination of the Tyne's locomotive exports, and it is clear that the East (East Indies, China and Japan), with 2,135, 1,447, 5,433, and 2,844 tons out of 4,698, 7,568, 6,295, and 3,718 tons respectively is our biggest customer, South America, and the Dominions, Australia, New Zealand, South Africa, and West Africa rank next. It is important to know this. Not so much because trends in demand can be seen, since clearly owing to the short span under observation this is impossible, but because it shows the relation of locomotive exports to the exports of general machinery and also because it shows the class of purchaser upon whom the locomotive builder of this area must mainly depend.

The overseas trade figures provide us with one further comment before this section of our enquiry is completed. This relates to the average value per ton of imports and exports in the Area on the one hand and the country on the other and their relative movement year by year.

The following table puts all the data into one composite picture.

TABLE 26.—Average value per ton: Exports and Imports; the United Kingdom and the Survey Area compared, with an added column for the average value of Exports from the Tyne.

Year.	Imports £ per ton.				Exports £ per ton.					
	United Kingdom.		N. E. Coast.		United Kingdom.		N. E. Coast.		Tyne.	
	Value	Index.	Value	Index.	Value	Index.	Value	Index.	Value	Index.
1920	222	100	121	100	138	100	108	100	124	100
1921	196	88	147	121	149	108	127	118	131	108
1922	179	80	146	121	129	93	115	108	116	94
1923	173	78	136	112	103	75	79	73	120	97
1924	176	79	94	78	97	70	78	72	73	59
1925	163	73	89	74	95	69	72	67	93	75
1926	160	72	74	61	98	71	55	51	101	81
1927	156	70	86	71	98	71	75	69	87	70
1928	169	76	69	57	95	69	85	79	88	71
1929	169	76	77	64	95	69	87	81	108	87
1930	167	75	80	66	98	71	85	79	—	—

For the present discussion, changes in the value of money may be disregarded, since broadly, what is true for the country will roughly be true for the Area. The clear fact then emerges that the exports and imports in which the Area deals are less valuable than those in which the country as a whole deals. And if the figures of the exports of the different parts of the North East Coast are treated in the same way, it emerges that, apart from 1920 and 1921, the Tyne ports handle more costly exports than is the case in any other part of the Area. As the added column shows, they approach more nearly to the average figures for the country as

a whole. The conclusion drawn from these figures is one which should be read in conjunction with that part of our analysis and the figures of production (section iv) which shows that the average value of product per head is less in the Survey Area than in the country as a whole.

(vi) Finance.

Financial data are not easily obtained. Few companies are of the Public Joint Stock Limited Liability type and only for a few, therefore, are published accounts available. Such figures as can be assembled, however, are given in Appendix XVIII, and here we must content ourselves with such generalisations, mainly it must be confessed of a "straw in the wind" type, that seem permissible.

Firstly, we may give the names of a number of those concerns in which—while not perhaps always as high as is usually regarded as a "fair" level of profit by business men themselves—the run of profits has been distinctly better than the average. In this list we have the Anderston Foundry Company, Messrs. Clarke Chapman, The Cleveland Bridge & Engineering Company, Messrs. R. Hood Haggie, Parsons Marine Steam Turbine Company, the Redheugh Bridge Company, Messrs. Redpath Brown & Company, Messrs. A. Reyrolle & Company, The Rivet Bolt & Nut Company, and the Whessoe Founding & Engineering Company. The names are interesting—and scrappy though the list is—the type of work it covers is, at any rate, in the direction of a confirmation of the conclusion stated elsewhere in this report, that (a) the most thriving branches of engineering have been certain classes of foundry work, constructional engineering, and electrical engineering, and (b) that in marine engineering, depressing as may be conditions generally, there is no reason to believe that the technical skill of the Area is below that of others. The first is borne out by the records of almost all the companies whose names are given above, and the second by the good record of Parsons Marine Steam Turbine works.

Further it is clear that the difficulties experienced by Messrs. Armstrong Whitworth, as reflected in their employment figures, have been also reflected in their financial figures. Their post-war run of profits has been small, below the 1913 level all the time, in spite of the depreciation in money, and merged in 1925 into a loss, no further returns being made from then to the reorganization of 1929. Apart from the fact that their capitalisation figures, no less than their employment figures show them to be—or to have been—the largest concern in the Area, it is significant that of the total capital—returned in 1925 as roughly 19 million pounds—almost half was in the form of debentures. Apart from these two striking features no other feature they display seems to be susceptible of a sufficiently general application as to justify notice. We would point out only that insufficient though the data undoubtedly are for providing a basis for a detailed study of company finance in engineering in this

Area, such tendencies as they do display, broadly confirm generalisation based on our other data. To show what the proportions of different kinds of capital are, would, in view of the small section of engineering thrown open to this kind of examination, be a futile piece of work. While it may be instructive to know that of the capital represented here, slightly more than 2/5ths was ordinary capital, slightly less than 2/5ths preference capital and about 1/5th debenture capital, and while this may be—particularly for the old Armstrong Whitworth Company a matter of some importance, no light is thrown on the financial position of the greater part of the engineering section of the Survey Area which—so far as these data go—remains obstinately anonymous.

**(vii) A more detailed study of the five main Engineering Trades.—
Conclusions based on Preceding Data.**

(a) Introductory Note.

In the preceding sections it has been our aim to present such data as could be collected so that trade alignments and tendencies might be discerned. We come now to that part of our task which asks us to estimate the future demand for labour and to assess future possibilities.

This must be difficult in any trade and at all times. We submit that it has never been more difficult than at the present and in no trade more difficult than in engineering. Such conclusions as we may come to, therefore, can be tentative and hesitant only. They are applicable in only the broadest possible way. In connection with a trade where business men themselves confess that they do not know what kind of business—even in their own firm—the next few years will yield, in which there is little or no information relating to trade or production on which to go, and which is built up of numerous trades linked only in that they have a common basis in metal working, and showing dissimilar fortunes, we would deem it injudicious to do any more.

For the stating of such conclusions as we can, we discuss this question in connection with five only of the numerous engineering groups of which the Insurance statistics of the Ministry of Labour make mention. These are General, Electrical, Marine, and Constructional Engineering, with the addition of Stove, Grate, Pipe, and General Iron Founding. Only in these five trades are numbers and proportions of workers significantly large.

(b) General Engineering.

It is desirable that we should realise at the outset what class of work this generalising category includes. It is far from being homogeneous. It includes firms with an employment roll running into thousands and engaged in the production of locomotives, armaments, or the latest in pulverising and firing plant at the one

end of the scale and firms with an employment roll reckoned in tens and engaged in the production of steering gear, winches or engineers' foundry products at the other. Necessary though it is therefore to take first the figures which are given by the Ministry of Labour for this category as a whole, it is even more necessary to pass on to an examination of classes within the class. Indeed no assessment of future trends based on anything other than a close examination could be treated seriously.

Taking first, then, the figures given by the Ministry of Labour it is clear that there has been a decline in both numbers insured and the numbers employed. This decline is borne out by the decline in the number of books exchanged—though it would be strange if it were not—and, more important, by the decline in the numbers returned as being employed in General Engineering by the members of the North East Coast Engineering Employers' Association.

The run of these various indices is as follows :—

TABLE 27.—*Comparison of various Indices relating to General Engineering.*

	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931
Books	—	—	—	—	—	100	80	90	96	106	92	78
Exchanged												
Employers	179	140	89	78	100	118	93	95	97	94	85	62
Returns												
Insured Persons	—	—	—	100	100	—	—	99	—	93	92	—
Employed	—	—	—	94	100	—	—	103	—	104	95	—
Persons												

Disregarding some lack of harmony which to some extent may be attributed to the fact that they have not all the same base, their general trend is sufficiently in unison for general purposes to call for no further comment.

The general inference which may be made from them is that 1929 may be accepted as being a good year. The Insurance statistics show it to be a year of maximum employment, while the figures of the Employers' Association, though not giving it first place, rank it sufficiently high, particularly of the period 1926 onwards, as to leave the generalisation undisturbed.

In terms of employment it may be summarised as finding employment for 25,764 persons, to take the estimate based on the Insurance figures—and as yielding no employment to 5,496 persons whom we may suppose would have accepted it. They account for 17.5 per cent. of the total of the insured. From discussion with business men it is evident that, putting on one side the exceptionally and abnormally profitable period immediately after the War, it is a year of whose activity they approve more than that of any other of the post-war period. They have described it to us as a "boomlet" but when questioned whether they consider that the next few years are likely to yield a similar degree of activity they state that they doubt it, but also frankly confess that the future is

so uncertain that the venture of an opinion is not reasonable. It does not seem to us that the question can be taken any further. To attempt to find what may be termed a good average specimen for General Engineering is to find oneself held up by the fact that 1925, which is apparently so from the data of the Books Exchanged, is not given in the other Insurance statistics which are available. We do not know the number estimated to be insured in General Engineering in the Survey Area in that year. Further, we feel that to attempt anything more elaborate would be to combat more theoretical and practical difficulties than the result would merit. In conclusion, 1929 seems on the basis of the Insurance statistics to have provided more employment than any other of the later post-war years and to represent a level of activity not anticipated in the next few years to come. We propose, therefore, to base our reasoning on the figures of 1929. Let us consider first the figure 17.5 per cent. which represents the 5,496 persons for whom it could find no employment. There can be no doubt that it is the lowest percentage of unemployment in the years of which we have record. It is 40 points lower than the unemployment of 1924, and 26 points lower from 1924 than the next best year, which on the showing of the Insurance statistics is 1923.

Could we say therefore that these 5,496 persons—left high and dry above the high water mark of the activity of 1929—are redundant? Let us sum up the position. Apart from the activity of the immediate post war years the employers' returns show 1929 to be the next highest employment year. It gives, on the showing of the Insurance figures, a maximum of employment, a minimum of unemployment, and further it is a year in which the number of the insured estimated to be attached to the industry is lower than in any other previous year. 1923, by contrast, is a year in which the number estimated to be insured in the industry is at a maximum. It is also evident that in the short run we are considering, unemployment is also at a maximum, being no less than 37.6 per cent. and the workers unemployed being no fewer than 14,015. The process, therefore, from 1923 to 1929 has been that of reducing the numbers of the insured, increasing the number of the employed and reducing the number of the unemployed. Returning to our original question could it then be claimed that these 5,496 workpeople represent a residual element to be reduced still more? The reluctance of the employers to lend their support to the opinion that the next few years will bring a level of activity higher than that of 1929 might seem to provide a basis for the answer that these workers do measure redundancy in engineering. Against this, however, is the undoubted fact that as industry is at present organized it demands as a normal feature of its labour market a fringe of undemanded labour whose numbers, even in the best years, do not sink to zero.

And added to this is the further fact that it is recognised that the average amount of unemployment normal to a "heavy" industry tends to be greater than the average amount of unemployment normal to a "light" industry.

Even granted then that there does not seem to be a likelihood of the industry absorbing in the next few years more workers than it absorbed in 1929, those left out in that year clearly cannot all be classed as redundant. A certain proportion of them must remain to provide that undemanded but demandable fringe which industry requires as a normal condition of its working.

Could it be claimed then—to seek another avenue of approach—that the industry in the Survey Area should have much the same percentage of unemployment as the industry in the country as a whole? Such a question is prompted by the fact that in the year of its minimum of unemployment the Area recorded a percentage of 17.5 unemployed as against a percentage of 8.8 for the whole country. And it seems to gain support from the fact that if this be indeed an index of redundancy the Area offends for every year for which we have record, but registers a difference which, as we pass from 1923 towards 1929, tends to become less. This is a result which, considering the reduction in the numbers of the insured in the period, one might expect. The point will gain in clearness and perhaps also in cogency by tabulation:

<i>Year.</i>	<i>Percentage of unemployment</i>		<i>Difference</i> 2—1.
	<i>in Great Britain.</i>	<i>in Survey Area.</i>	
	(1)	(2)	(3)
1923	21.2	37.6	16.4
1924	14.2	26.9	12.7
1927	9.5	24.9	15.4
1929	8.8	17.5	8.7
1930	15.7	24.9	9.2

Thus whatever the direction of the change it is the same for both country and Survey Area. And further, although the gap tends to be reduced, the figure for the Area shows a disinclination to fall but a ready inclination to rise.

The case seems plausible: but before coming to any conclusion on the point—if indeed anything so definite as a conclusion be possible—certain points must be met.

In the first place this Area does not present the same occupational choice as does the country as a whole. And if mobility be less (see memorandum XV for discussion on this point), then these two factors together might lead one to expect that normally there would tend to be a higher percentage of unemployment here than in the country as a whole. Against this, however, is the counter statement that the form which the process of industrial development has taken

has been essentially that of regional specialisation and that therefore occupational opportunity will tend to be similarly limited by specialisation in other areas. It is not at bottom a comparison of this Area with the rest of the country but one rather between this Area and other areas similarly specialised. But it is clear that this, which on one side is a counter statement, is really a statement which contains an important element of support, for clearly if the comparison *is* one between a number of specialised areas then whereas they—with our own Survey Area included—return a percentage of unemployment of 8.8, *this* Survey Area taken singly returns an unemployment percentage of 17.5. Redundancy in this Area seems to be clearly indicated—and the conclusion is clinched, it would seem, by the reflection that Motor Engineering, Electrical Engineering, particularly of the lighter kind, and other forms of light metal working which *do* tend to be apart and away from the heavily specialised centres are classed by themselves under different categories. "General" Engineering therefore gives them no place.

Provisionally, therefore, it might seem that the idea that a first approximation to a measure of the Area's redundant labour is to be found in the difference between the percentage of unemployment in this category for the country as a whole and the percentage of unemployment for the Area has something to commend it.

Two other factors add their weight—the loss of armament work as compared with both 1913 and the war period, and mechanisation. Both are important but for this Area the second, it would seem, is much less important than the first.

Taking the first, the best comparison seems to be, not with war time activity but with pre-war time activity, for then the truest measure of the loss of work is arrived at. Estimates of the numbers engaged upon armament work vary. Some have stated that before the War 25,000-30,000 workers found employment in this class of work and that over the last five years the number has fallen to between 4,000 and 5,000. Another authority has kept more strictly to the numbers engaged on this work in the firm out of which have emerged the concerns we know now as Messrs. Armstrong Whitworth and Messrs. Vickers Armstrong. This latter procedure seems to be the best, for in the first are included workers who should properly be classed under Shipbuilding rather than under General Engineering. Such an estimate as the first, therefore, while quite true and important from the point of view of the area is not strictly relevant in a discussion of General Engineering. The second broadly confirms the first giving also a high peak figure for the period of the War. While, obviously, the reduction from the high figure of the War period must have been a complicating factor in the immediate post-war situation and may

still have some weight, though of this we have not been able to obtain direct evidence, the most important change, we submit, is the reduction from a relatively high pre-war norm to a post-war norm considerably lower. This trend is confirmed by the steep reduction which is shown by the data of the Books Exchanged. One branch of the parent stock was returned as employing roughly 8,000 in the year 1925 as against roughly 3,000 in 1931, and 4,000 in 1929, while the other over the same period and for the same years returned the figures 2,679, 1,065, and 2,112 respectively. And these cover not only armaments but all classes of work they do.

The matter has not merely its quantitative aspect. The unemployment of these men injects a new and serious element into the problem of the Area's unemployment.

They have been reduced mainly for lack of a certain special kind of order, and they have been reduced at a time when other engineering firms in the district—themselves depressed, and having their own men unemployed—are not disposed to give them employment. Such men therefore tend to be unemployed for long periods. Though they have probably more than the average degree of engineering skill, ordnance work demanding more precision work than almost any other, they cannot market it because the engineering firms of their area are themselves not employing all the men of whom they have personal knowledge and whom they know to be acquainted with the class of work which they as business firms normally do. We are informed further that workers whose craft has been learned in ordnance work—work for a market in which quality was and is a greater consideration than cost—do not adapt themselves easily to the demands made by ordinary and competitive commercial work. If then the diminished flow of orders for armaments and ordnance is to be regarded as a permanent factor in the situation then in this Area—a specialist in such work—redundancy of labour cannot but be accepted as a fact not needing trade variations or indeed any other cause to establish it.

The other factor is labour displacement due to reorganisation by amalgamation and/or mechanisation. The operation of this factor in the present century is an accepted axiom. It is surprising therefore to have to record that in the opinion of a representative group of engineering trade employers it is a factor which, in this area, is not operating with greater force than in the pre-war period. Some individual instances, it is true, have been noted where the process has been quickened and in these the percentage of displacement has been given as approximately fifteen. Against this it has also to be noted, however, that these cases are few in number and that they occur in connection with firms which either make considerable quantities of the lighter kind of engineering products, or secondly, have been compelled because of a serious falling away in

demand, to put through a drastic policy of reorganization involving a considerable change in the class of product and the kind of market with which they have been connected. Apart from these few instances no evidence has come to light to throw doubt on the statement made by the Employers' Association. They themselves base it on the reasoning that in the main the engineering work of this area is of the heavy kind in which the automatic processes suitable to light engineering are not so profitable. And the figures which they gave of the proportions of skilled, semi-skilled and unskilled men over the period 1913-1931 show a steadiness (see memorandum on Labour) which bears them out.

Surprising therefore though it may seem we must record that labour displacement due to mechanisation does not seem to be a phenomenon which in this Area need be emphasised.

Nor, further, does much displacement appear to have been caused by amalgamation. The records which have been made available to us and the enquiry which we have made bring to light only two important examples. One fusion resulted in a transfer of work involving roughly 400 workers, and a boiler-making firm appears to have been bought up and closed down as part of a policy of competition elimination which was being carried through by a combine.

We are left, therefore, with two main factors—lack of work due to a falling away of orders in the ordinary commercial market, and lack of work due to a falling away of orders in the armaments market.

And this conclusion seems to be confirmed by the results of a detailed examination of the data of the Books Exchanged which constitutes the greater portion of the following section.

This is material supplied by the Ministry of Labour and gives us particulars of the firms covered by each category together with the number of books each firm exchanged in bulk in July of each year over the period 1925 to 1931 inclusive. It thus provides a means for stripping off the misleading coverlet implied by the use of the one term "General Engineering," and gives us some idea of the relative sizes of the different firms, together with their different fortunes and activities. It is not a perfect guide, for not all firms are included. It omits all those, for example, which do not employ 20 workpeople or more, and we are given to understand that not all firms exchange their books in a manner which results in the appearance of their workpeople in these returns. Inference drawn from them must not therefore be pressed too closely. We have no reason to believe, however, that their evidence is misleading and we feel that they provide a useful confirmation and continuation of the story as revealed by the Insurance statistics already discussed.

As some small contribution towards providing that this belief is not likely to lead to false conclusions we may perhaps quote, however, some of the tendencies of employment which they show; they must be compared with the tendencies displayed in the employment indices of the earlier data.

Take Electrical Engineering. The run is as follows :—

<i>Electrical Engineering.</i>	1927	1929	1930
Insurance data: employed persons 1924 = 100	116	114	131
Books Exchanged: 1925 = 100	108	111	128

Or take Constructional Engineering in which the run is 110, 118, 99, as against 135, 137 and 124.

In General Engineering it is 103, 104, 95, as against 90, 106, 92.

Taking into consideration that the Insurance data of the earlier sections omitted 1925, 1926, 1928 and 1931, while the Books Exchanged omit 1923 and 1924, so that comparison is possible only for the years 1927, 1929 and 1930, the tally is sufficiently close to make further discussion unnecessary.

We may return, therefore, to the thesis developed earlier and test it with reference to the Books Exchanged. It was, to repeat it, that the main difficulties in General Engineering could be summed up in terms of losses in two markets—firstly the ordinary commercial market and secondly in the armaments market. This is at once clear if the data for the recognised specialist in such work in the Area are given—namely for what we know now as Messrs. Vickers Armstrong and Messrs. Armstrong Whitworth. Employment in both taken together is indicated as having fallen from 10,535 in 1925 to 6,354 in 1929 and 4,024 in 1931. A considerable portion of the loss would appear to be at once located. The trend downwards is clearly brought out if their employment figures are expressed as an index number and the trend of General Engineering exclusive of the Armstrong Whitworth figures be given for comparison :—

	1925	1926	1927	1928	1929	1930	1931
The Armaments Group	100	89	64	60	60	60	39
General Engineering without the Armaments Group.	100	76	107	119	136	113	104
All General Engineering	100	80	90	96	106	92	78

They do not share in the 1927-29 upward tendency of the rest of General Engineering—unless their stability round the index of 60 is an indication of such a share—and with the decline of 1931 they sag badly downwards. Further, throughout the period they have become responsible for a smaller and smaller share of the total number included in the category. No less than 39 per cent.

in 1925, the proportion of workers they contribute to the total has sunk by 1928 to 24 per cent. and in 1931 is no greater than 19 per cent. Their commanding position has clearly gone and the gradual whittling away of their labour complement must clearly be regarded as perhaps the biggest single factor in the creating of the unemployment problem of General Engineering.

Turning now to what we have termed the commercial market the first move is to isolate the figures for locomotive engineering—an industry, as previous discussion will have indicated, particularly connected with export trade and therefore particularly exposed to foreign competition. While the figures are not a complete cover of this branch, seeing that some firms which do locomotive engineering are classed, because of important work in another direction, in another category, we yet feel that they are valuable because they show the variations in what may be termed the locomotive engineering specialists of the Area.

As a group they are not to be despised. They gave us nearly 7,000 out of 27,000 workers in 1925 and 6,000 out of 21,000 in 1931. Though clearly their record is a sign of difficulty, it would seem at first sight as though they had experienced less difficulty than General Engineering as a whole. If an index of the Books Exchanged be constructed for them and this compared with a similar index for General Engineering then their greater relative stability, albeit at a lower level, is evident. As the following comparison then shows, they do not share, perhaps, in the improvement in trade of 1929 as much as other firms in General Engineering, but they do not sink, relative to 1924, either so abruptly or so much in the slump of 1930 and 1931. Such stability is surprising.

More detailed examination still reveals the fact, however, that their relative stability is not due to what may be termed the competitive locomotive engineering group but to an expansion in the numbers returned for the L.N.E.R. at Darlington in 1931 in a year when other firms fell. The figures returned for competitive locomotive engineering fell from 3,207 to 1,201 while the total figures fell from 6,290 to only 5,877. The distinction becomes even more clear if a separate index be constructed for each, and comparison made between all three. The picture which they then present is as follows:—

	1925	1926	1927	1928	1929	1930	1931
Total of General Engineering ...	100	80	90	96	106	92	78
All Locomotive Engineering ...	100	79	79	95	95	94	87
Competitive Locomotive Engineering	100	71	51	82	83	103	38

Clearly the competitive locomotive engineers suffer more variation. They move upwards more freely for a trade revival which for them lags strangely into 1930, but experience considerably more acute depression in 1931.

These are naturally not the only firms which show decreases over the period, but they seem to be those which contribute most to the problem of engineering unemployment. And summing up we may say that in the first it is because of the loss of important orders due to policies and tendencies not having their origin in trade; and in the second because, as was stated before the Balfour Committee, and has been confirmed for this Area by independent enquiry, the locomotive engineering industry has definitely too great a capacity for present demand. Nor does the fact that the two are connected ease the matter. The problem has been made more complicated in this Area by the fact that in an endeavour to find other outlets for their capital and labour, Messrs. Armstrong Whitworth have concentrated more upon locomotive building and have been conducting experiments for some time now in the production of Diesel-engined locomotives, and rail coaches and road vehicles which appear to be seriously considered by the railway companies.

Competitive locomotive engineering in the Survey Area cannot look forward to an easy time. Enquiry has made it clear to us that it is a section of engineering in which at the present time acute competition, lack of orders and price cutting of an extreme kind are rife; quoting from their own words: "Enquiries have been few and far between, competition is so keen that the prices obtained are rather worse than those of marine engineering and are wholly uneconomic."

Their markets overseas, mainly the Colonies and Dominions, the countries of South America and the East, have failed them partly because of the erection of tariffs and the fostering of an economic nationalism, partly because of political disturbances and war, and partly because of a relative poorness to which, in the silver-using countries, the decline in the purchasing power of silver has been a contributory factor.

In face of this, no attempt, it would appear, is being made to arrange either a pooling of orders or a closure of plant. On the other hand, even through a period of trade slackness to an acute degree, firms have maintained their policy of renewing their plant. So much so that in their opinion there is no reason to believe that their plant has been allowed to fall into a state of relative inefficiency.

The problem is thus intensely complex and its complexity is not diminished by the fact previously mentioned that we seem to stand to-day on the threshold of developments in the use of electricity the form of which no one as yet can clearly state. If railway electrification is developed, then (see section on Electrical Engineering) the Survey Area will presumably benefit in certain directions, but equally clearly a potential market for

the Diesel-engined, electric locomotive on which Messrs. Armstrong Whitworth have spent their time and money may be closed. If on the other hand railways and road transport firms take up their Diesel-engined coaches and road vehicles (the Armstrong-Saurer type) then presumably the labour complement of Messrs. Armstrong Whitworth will expand. But how precisely such developments would affect (a) the competitive locomotive group, (b) the railway shops, or (c) both together, it is impossible to say. All that seems possible is to state that while depression has been intense enterprise and initiative have not been wanting; that although no move towards co-operative working has been made yet firms have kept their plant up to date; that in the locomotive engineering field the reputation of the makers of the Survey Area is still high and that in the new types of product for which the specialist armament makers have been responsible, publicity and serious consideration by possible customers have not been lacking.

There is, however, another side to General Engineering which we must examine. This is not the whole story. The position in General Engineering is not wholly unfavourable. Detailed examination of the Books Exchanged has revealed important variations between different sizes and different classes of firms. Even during the depression—even if the basis of comparison be 1923 and 1931, a year of intense depression—a number of firms have made either continuous expansion or a decline so slight as to be neglected.

Taking, not all years, but only the more significant ones and casting their movements into the form of an index with 1925 as its base, we have the following results :—

Movement of employment in different classes of firms as shown by the Books Exchanged.

<i>Large firms employing—</i>	1925	1929	1931
Over 1,000	100	101	75
Over 500	100	102	74
<i>Smaller firms—less than 250</i> ...	100	114	83
General Index for General Engineering as a whole.	100	106	78

Thus, on a percentage basis, large firms have expanded employment to a lower degree than the group as a whole, and to a very much lower degree than that reached by the group of small firms. On the other hand, they appear to have shared much more heavily than either in the 1931 depression.

This disparateness of movement seemed to us to merit more detailed examination. Accordingly, the records of all those firms which showed an expansion over the period, or only a slight fall in employment, were taken out of the main body of data and separate index numbers constructed for them. Such firms are twenty in number, are varied in size, eleven being below 150 workers and 7 above 250, and account for 8,647 workers out of a total of

26,900 in 1925 and no fewer than 12,220 workers out of a total of 21,003 in 1931. Thus, as the following table shows, they are a fairly robust group :-

TABLE 28.

Workers included 1925	Class.	1925	1926	1927	1928	1929	1930	1931	Workers included 1931
6,629	Above 500	100	88	119	124	129	119	145	9,653
1,041	500-250	100	105	141	153	175	168	131	1,363
634	250-100	100	77	86	113	113	105	102	645
303	100-0	100	137	154	158	196	139	154	559
With which may be compared the General Index for General Engineering as a whole.		100	80	90	96	106	92	78	—

Three classes sag, two only slightly, with the general decline of 1931, but one, and this the largest group, records a considerable increase. It is this group which is also responsible for the greatest increase in employment. The 45 per cent. rise which they displayed in 1931 as compared with 1925 meant employment to 2,984 workers, while the much greater percentage rise of the smallest group, 84 per cent. meant additional employment for only 256 workers. Such tendencies, countering apparently the unfavourable position of the group of large firms as shown by the previous analysis, raise a further question. It is evidently necessary to examine the records of these firms still further with the view of finding out how the increase has been shared. Has it gone to one or two firms only, or have all shared roughly equally? Have all classes of engineering work in the category found slightly equal representation or have one or two classes only been affected?

Of the largest class the major part of the increase was due to two concerns, although three had their share. The L.N.E.R. figures for Gateshead jumped from 1,613 to 3,081, and their Darlington figures from 3,540 to 4,676. The other firm engaged in the production of various kinds of pulverisers, and firing equipment, returned the relatively modest increase of 330 by moving from 1,516 to 1,836. There can be no doubt that here expansion in the Surrey Area, at least so far as the figures returned are a guide, has been dependent upon the movement made by the L.N.E.R.

In the class 500-250 the movement has been more evenly shared. One firm made a relatively conspicuous jump from approximately 200 to 350, but the other three contented themselves with a relatively quiet upward movement within the limits 275-350. It is significant that they are all forge and foundry men. In the 250-100 group no great increases have taken place, but the movements in each case have been steady and sustained. And the classes of work covered vary from machine tool making to the making of lifts.

The smallest group shows, as might be expected, a considerable variety of work though no movement which could be termed conspicuous. Michel Bearings, a tool making firm, a Tyneside iron-works, and a small firm of agricultural engineers, are included in the list and by their variety do something to counteract the view that the Area possesses nothing but the basic industries of which other sections of this Report are necessarily so full.

There is thus good evidence that within the whole mass of General Engineering there is a smaller group of firms which through an intensely difficult period have shown considerable thrustfulness. Not only have they expanded, or shown a power to resist contraction at a time when contraction has seemingly been the general rule, but they have also indicated a variety of individual effort which, in view of the prevalence in this Report of references to declining basic industries, cannot but be pleasing. And finally it is clear that much of the expansion in some sections has been associated with the L.N.E.R. More stable than the ordinary competitive type of engineering, its presence has provided a welcome poise and steadiness.

Can these together however outweigh the causes making for depression? Can developments by the L.N.E.R. outweigh the decline in other engineering firms, affected as they are by excess capacity, faced by tariffs in their overseas markets, and promised a keener competition in the next few years than before? Can the more virile element in General Engineering overcome the inertness of the mass, seeing the special causes which lie behind it; can the developments which have been noticed in the firms previously specialists in armaments to a much greater degree than to-day cancel the losses in their labour complement caused by armaments diminution? These are key questions. Whatever answers the long run may make to them it is our view that in the short run of the next few years they will not be sufficient to absorb the engineering labour which the Area can supply.

Nor does there seem much chance of adding new lines to the Area's activity which would—again in the short run—make much impression on engineering unemployment. It is true that there is activity in the production of coal-cleaning plant. The Birtley process of dry cleaning which appears to be gaining an increasing reputation will no doubt result in an increase in the labour force required, for there is ample scope for expansion both at home and overseas. Other patents for cleaning plant have been developed in the Survey Area, too, but the rate of expansion of the firms concerned in the past six years has not been great. While they make their contribution to the credit side of the account it seems that many many more of them will be required before the surplus is absorbed. Further it seems as though this Area has put off the

making of certain forms of equipment, as for example, coal-cutting equipment, so long that it is now too late for it to begin—even though it appears likely that the next few years will see a considerable local demand for them. The Area, however, will take its supplies from outside. It seems clear that outside makers—some Scottish, some foreign—have so established their names and their connections—have had so much experience of the early difficulties of experimentation and the like, that the likelihood of any firm within the Area turning now to the production of coal-cutting machinery and making headway is, during the next few years at least, extremely small. So also would the position seem to be in connection with much of the machinery used in other industries. Enquiry has shown that in the main, other industries—flour milling, confectionery, printing and the like—tend to secure their machinery from firms outside the Area.

The engineering firms of this Area appear therefore to have been tied in the past mainly to engineering work connected to locomotive building, or with armaments. Some variety is now being introduced but it does not yet seem large enough to make up for the losses in other directions. We are left, therefore, with the mass of unemployment caused by the loss of armaments and locomotives exports and a general area depression the extent and meaning of which are made clear in other sections.

Our earlier suggestion that the minimum measure of redundancy is to be found in the difference between the Area's percentage of unemployment and the country's percentage of unemployment would not seem therefore to involve us in any danger of excess.

And this conclusion may be couched in the following terms:—

In 1929 the Survey Area had an unemployment percentage of 17.5 as against the country's percentage of 8.8; with 17.5 per cent. of its insured workers unemployed, it thus carried in absolute numbers an unemployment roll of 5,496. If it had had the country's percentage of unemployment it would on the other hand have only 2,751 on its roll.

In general terms we may say, therefore, that there would appear to be at least 2,745 of the workers insured under General Engineering who, in this Area, may be classed as redundant.

(c) *Electrical Engineering.*

As has been already shown, Electrical Engineering offers marked contrast to other engineering trades. Not merely does it record prosperity, but it is dominated by only two large firms. The remainder of the trade is made up of a number of small firms employing relatively small numbers of workpeople. The importance of these large firms may be gauged from the proportions they employ. In 1925 they were responsible for 3,293 out of a total of 3,510 workers, and for 4,267 out of 4,563 workers in 1931. While 1929 is not for them a peak year, as it is for most other

engineering categories, it may perhaps help towards completeness if that year also is given. In 1929 they were responsible for 3,337 of 3,900 workers.

The reason for their activity may be placed to the account of their enterprise and the development of electric power production both in this country and abroad—in this country, and more narrowly, in this Area, mainly a matter of the development of the “grid.” From a survey of orders placed in this Area and reported in technical journals, it is obvious that “grid” work—though, again, not solely in this Area—has been their main source of employment.

Their efficiency and standing may be gauged from the fact that firstly one of them has recently been visited by a large body of engineers who appear to have been keenly appreciative of the excellence of both works and product, and secondly from the fact that the other has led the way in the making of metal clad switch-gear, making safe the using of the highest currents, and has established connections and good-will world wide in their scope. It may be seen also from the note which has been drawn up by the Electrical Engineering Department of this College and which we add as Appendix B. For these reasons they have been working almost to complete capacity at a time when other engineers have been idle. This being so it is curious to note that our records show us 11.3 per cent. unemployed in 1923, 7.1 per cent. in 1927, 10.3 per cent. in 1929 and in 1930, 8.7 per cent. Admittedly this represents a much smaller volume of unemployed labour than is to be found in other sections. Further it is obvious that their percentage of unemployment is the lowest our records contain. Why then do we again find the level of unemployment in the Area greater than in the country as a whole? While it has not been possible to find a precise explanation of this phenomenon it seems to us that it is a result which, granted certain other factors, might be expected. Electrical Engineering being the brightest spot in the engineering world of this area has meant an additional attractiveness relative to other forms of engineering. In the making of smaller parts of electrical equipment a certain amount of automatic machinery can be used, and therefore semi-skilled labour can be employed more usefully than in other branches. The Electrical Engineers therefore have been able to exercise more choice in the labour market. Any workers not proving suitable could be turned off without much difficulty being experienced in the filling of their places. And such workers would then tend to be registered as electrical engineers. An expanding industry—working to capacity—is thus not incompatible with redundant labour, for this arises out of the general engineering conditions with which Electrical Engineering is hemmed in.

There can be no doubt then but that Electrical Engineering in the Area has been thriving. But how long such a statement will

remain true—and what chances there are of expansion—are matters which again are made difficult by uncertainty. As has been stated, much of the work of these two firms has been for contracts placed by the Central Electricity Board and other similar large-scale electric installation orders. Such work cannot be indefinitely prolonged and authoritative opinion has stated to us that the difficulty of the future will not be merely that of the cessation or diminution of such orders. It has been suggested that they will also experience a diminished flow of orders in that small firms originally customers of theirs for small low-powered electric sets, will, because they are hitched, as they put it, to the "grid," no longer need such sets. If so, it appears that should no further large-scale development, such as railway electrification take place then Electrical Engineering in this Area will experience a set-back. And this is a view which seems to harmonise with what is thought within the trade itself.

This being the case the difficulty of deciding what the future trend will be is evidently well nigh insuperable. It is dependent upon decisions made quite external to Electrical Engineering and involving questions of public policy most complicated and difficult in themselves, the subject of numerous public and technical enquiries already, and in any case far beyond the competence of this Report to discuss. It is a point well worth the noting however that the firms most likely to be affected are under no illusion as to their position: and there is an enterprise and initiative being displayed by them which is an encouraging feature of the situation. They are alive to the necessity of research, of opening up new markets overseas and of finding new electrical products to replace old products no longer needed to the same degree. They have made good profits during the last few years (see Appendix XVIII) and have therefore reserves to draw upon which the more depressed firms in this Area no longer possess.

While, therefore, the future for them may be distinctly one of difficulty and uncertainty we see no reason to doubt but that it will be met with fore-knowledge of its coming.

Using the same measure of redundancy as before, it would appear that this Area contains on the basis of the 1930 figures rather less than 100 surplus workers and in view of the foregoing it would seem unlikely or at least uncertain that they will be absorbed.

(d) *Marine Engineering.*

In Marine Engineering, as the figures given earlier might lead one to expect, the position is one of intense difficulty and stress. Linked closely to the fortunes of shipbuilding it has, it would seem, shared the difficulties which that industry has experienced because of lack of orders, excess tonnage, and the fostering of shipbuilding in other countries for reasons that are associated more with economic nationalism than the needs of trade.

It is also evident that the industry has suffered much because of price undercutting which is the cause of considerable resentment. In almost all cases enquiry resulted in replies which support either or both of these conclusions, and it is clear that this holds good for all three rivers of the Area. While this is apparently well realised by the trade, there does not seem to be any definite move being made towards amalgamation or any other form of co-operation. Firms, we are assured, are maintaining their plant in reasonable efficiency but it is clear from the financial data that reserves are being depleted and losses made at such a rate that such maintenance of their standard of efficiency will not be possible for much longer. While, therefore, it would appear from the production statistics of earlier sections of this memorandum that the Area has on the whole held its own in the matter of output it would seem from this that the work done has not been entirely on a profitable basis. Of the validity of this the following characteristic statements by firms in this section—"cannot see any reason why orders should be taken from this area except that some people must be prepared to lose more money than we are"; "orders are being accepted at prices much below the cost of building"; "the desire of foreigners to keep the work in their own countries" are perhaps adequate confirmation; the position would also appear to be comprehensively summed up from the business man's point of view in the following reply received from a leading firm of marine engineers, "owing to the scarcity of orders and the number of sources of supply competition has been and is intense, resulting in prices being quoted by firms in this country which do not include any overhead charges and are frequently below cost of labour and material. This policy is evidently adopted with a view to tiding over the period of depression and keeping the staff and plant going. Costs in this country cannot be appreciably reduced so long as State and local expenditure and taxation remain at present high levels and employees in sheltered trades continue to receive wages in excess of those engaged in the world's competitive industries."

It is a familiar thesis. It was expounded before the Balfour Committee, and detailed in the recent publications of the Engineering and Allied Employers' National Federation. While it is not our business here to attempt an appraisal of these reasons—lacking as we do the power to cross-examine and go through firms' accounts on which alone appraisal of any worth-while kind could be based—we feel that it is not unimportant to record that here again the views of the Area are an echo—or better perhaps, a part, of the views expressed by this section of Engineering in the country as a whole.

From the data of production already given, from the unemployment figures already given and in view of the foregoing replies, indicative of excess capacity, there seems little doubt that there is also an excess supply of labour. But before attempting any conclusion on this point it seems desirable to do for the Marine Engineering what was done for General Engineering—namely, attempt to display the varying fortunes of firms of different size.

Taking first the figures for 1925, it is clear that the tendency is for the firms to be more evenly dispersed than in General Engineering. Of 19 firms, five employed more than 500 workers, five employed between 250-500, five employed between 100-250, and four employed less than 100 workers.

Examination of the movement of the smaller firms indicates a greater power of expansion relative to the large firms but it should be remembered that the totals are so small in them that percentage movements alone may be misleading. The only comments which appear to be reasonably safe are that in the main all firms move together—they slump together in 1926, in the main enjoy peak expansion in 1930, and slump heavily together in the depression of 1931. Rising steeply after 1926, and falling steeply in 1931, they appear to have experienced extremes of fortune as the outcome of which an inability to see or plan clearly ahead might only be expected.

While this position, broadly conceived, is clear, the assessment of redundancy is, by contrast, extremely difficult.

By 1929 a considerable reduction in the numbers attached to Marine Engineering had already been made. 25,610 in 1923 the figure had sunk by 1929 to 18,590; and in this year, a year of minimum unemployment, 2,323 persons were unemployed—a percentage of 12.4. In this year the country, too, had a small percentage of unemployment—8.7. So that had the Area had only the country percentage it would have had only 1,617 persons unemployed, thus giving 706 as the minimum measure of redundancy. By 1931, however, although there has been a steep rise in the number of the unemployed there has also been a further fall in the number insured from 18,590 to 18,020. This would apparently account for 570 of the redundant workers and leave only 136 out of 18,020 as redundant. There are so many variables which it is impossible to measure—what, for example, is the extent of labour redundancy in the country as a whole, how has the relative labour position on the North East Coast moved during the slump—that no definite conclusion appears possible. Nor does comparison of production and employment throw much light. It tells us merely that for the years 1924, 1927, 1929 and 1930 the run of employment was 100, 84, 91, 88, and the run of production 100, 106, 163, 158. This shows that the Area is capable of turning out the relatively high figure of production for 1930 with 12 per cent. less labour than was required for a much smaller volume of production in 1924: but as the industry has *already* reduced its numbers in a ratio rather *greater* than the decrease in employment the statement rather loses its moral.

We are left then with the thought that badly depressed as Marine Engineering is in the Survey Area a figure somewhere between the two low figures of labour redundancy may not be so fantastic as at first sight it might seem. The industry has after all, between 1923

and 1931, shed no fewer than 7,590 workers or roughly between a third and a quarter of its original amount and it had shed no fewer than 7,020 of these between 1923 and 1929.

(e) Constructional Engineering.

In Constructional Engineering as in Electrical Engineering, the trend of employment has clearly been more favourable to the Area than in General or Marine Engineering. Its disadvantage, again like Electrical Engineering is that it accounts for only 7 per cent. of the total insured of the Area as against the 40 per cent. and the 25 per cent. of General and Marine Engineering respectively. The expansion of employment moreover in 1930 and 1931 received a check. The number unemployed rose from 570 in 1929 to 1,245 in 1930 and 1,480 in 1931. The number estimated to be insured in the industry continued to show, however, the expansion which had characterised it from 1923 onwards. 5,210 in 1923 the number of the insured was 5,890 in 1929, and no less than 5,960 in 1931 in spite of the fall in employment.

Favourable though the position may seem, therefore, in Constructional Engineering relative to other branches of engineering up to 1929 its record from then onwards must be regarded very differently. If it could be deemed certain that the fall in employment is due only to the general trade depression the position might not be so serious. Admittedly it is serious to find that the figure for the insured has not the resilience which, in view of the fall in employment, may be considered desirable, but if future trade prosperity could be expected to re-absorb them later the position could be accepted more calmly. Enquiry amongst constructional engineers however reveals that they do work mainly for home and foreign municipal corporations and railways, on the making of gas plant, in railroad work, bridge work and the like. Either then they are specialist makers of highly complex plant, making for municipal authorities and chemical firms, or they are more generalised makers on home account or on foreign orders mainly connected with overseas development. Up to 1929 development in the chemical industry, municipal spending, and the spending, by railways, of relatively large sums on bridge and other repair work kept them busy. From 1929 onwards the depression in the chemical industries and the later check to municipal and other large-scale spending has reduced considerably the volume of their work. Their foreign work has also suffered with the collapse of so many Governments overseas and the consequent pre-occupation of these peoples either with internal trouble or economy. Definitely then for the time being work has slumped. Whether it will recover seems to them to be dependent upon recovery in world trade, and further developments in reconstruction and large-scale planning at home.

The position of the industry has been made more complicated by the fact, however, that competition has become more intense.

Firms have entered the Constructional Engineering field who previously had no, or little contact with it. One firm, for example, originally a shipbuilding firm, now offers work in the less complicated sections of Constructional Engineering. Messrs. Dorman Long, to take another example, have gone in strongly for bridge building. Admittedly the work they have done has been good. It seems indubitable that the publicity which the building of the Tyne and Sydney Harbour Bridges has brought to the North East Coast has been, or will be, of service more generally. But it seems equally indubitable that their entry has made competition in Constructional Engineering more intense. In view of this added competition, and of the character of the market for which they cater, it seems clear that for the next few years the capacity of the industry will be in excess of requirements. If however there is a change in public policy; if to economy should succeed a policy of large scale collectivist spending and planning, then it would not. Such figures of redundancy, therefore, as are submitted below are tentative only. They refer to a condition of affairs which different public decision would soon change; and further they are again based on the difference between the Area's percentage of unemployment and that of the country as a whole.

In this case, however, a slightly different mode of comparison has to be adopted. 1929 is, it is true, a year of minimum unemployment and of maximum employment for the Area, but its position is so favourable when compared with that of Great Britain that it has to be neglected. It shows, we submit, a position which for the whole of the period we have reviewed is false. It reveals a percentage of unemployment which is less for the Area than for the country as a whole, one of the rare years in which this is true. The true position, we feel is better displayed by a comparison of *average* percentages of unemployment over the whole of the period. And it is on this basis that our assessment is made. Over the period, then, the Area had an unemployment percentage of 15.5 and the country one of 11.7. The average number insured in Constructional Engineering was 5,585. If then it had had the country percentage of unemployment it would have returned 653 workers as unemployed. As it was its average annual unemployed roll was 951. Thus on this basis some 300 of its insured should be regarded as redundant.

This examination however is not sufficient. The question of the assessment of the Area's redundant labour is brought up for further discussion in a later section. It is advisable therefore to let final judgment wait until that further discussion has been made.

To the questions of mechanisation and amalgamation it does not appear that much consideration need here be given. They do not seem to be factors of any great importance; for, as regards the first,

either, we are informed, the value of the work is such that machines cannot replace the high degree of human skill required as, e.g. in the making of complicated gas plant; or else as in bridge building the machine, except in one or two cases not affecting greatly the amount of labour needed, is not suitable. As regards the second, it would seem that firms while apparently maintaining their plant up to an efficient level are inclined to pursue that policy of individualistic competition already noticed in connection with Locomotive Engineering and Marine Engineering.

(f) *Stove, Grate, Pipe, and General Iron Founding.*

In Stove, Grate, Pipe, and General Iron Founding the Area has shared in the run of relative activity which has been a feature in this section of metal working in the country as a whole. Our records show that 1923 was its year of minimum employment and also (excluding 1931) of maximum unemployment. From then to 1929 the tendency has been to increase employment steadily each year and to bring down the unemployment percentage. Contrary to the general rule 1930 provided it with its maximum employment but, again excluding 1931, it also provided it with its maximum unemployment, for there appears to have been a greater increase in the number insured between these two dates than between any other two in the run of years of which we have record. Welcome though this run of activity up to 1929 is, in view of the depression which has marked other engineering trades, it is disturbing to note the persistency with which the insured figures rise as compared with the figures of the employed. More disturbing even than this, however, is to note further that they carry their increase into 1931, when employment falls to its next to the lowest level since 1923 and gives us the biggest percentage of unemployment recorded.

It is an increase which has been a puzzle not only to us but also to business men themselves. While they can explain the run of activity of the greater part of the period by the stimulus given to this section by the large scale building developments of the post-war period and the consequent demand for various forms of light castings, and by foundry work done for railway companies here and abroad, they have not been able to explain why, when both these have diminished in the last two years and in addition a trade depression developed, the numbers attached to the industry should still increase. One explanation has been made which we must report without being able to support by either statistical evidence or confirmation from other sources. It is given entirely on the authority of a business man in this section. It is that during the last few years orders for the various types of castings used in building have been placed more and more in bulk by merchant builders working in association. These orders—tending to be aggregated orders it would seem—have not always gone to the same firms,

but such firms as have secured them in different years over the period have found it necessary, in order to cope with them, to make additions to their staff. Such men, however, employed during the period of work upon such orders—have not found permanent places with these firms. Not only do the normal requirements of these firms necessitate smaller staffs, but it may be that in future years they have not succeeded in securing the large builder's contracts. Their staffs, therefore, have had to be contracted, and in the ebb and flow of work between the different firms a portion of the workers added have not been able to find work. This may be a true explanation—and it may not; we have no means of judging. Whatever dubiousness, however, there may be about such an explanation, there can be none attached to the view that the persistency of increase of the insured figures is a factor likely to cause further trouble. Not only does there seem to have been already a diminution in work for building, but should the economy policy already in vogue last for any length of time then orders to this section are likely to diminish still more. Orders have diminished, too, from railway companies both at home and abroad, and in the opinion of those in the trade there is little likelihood of any considerable expansion showing itself over the next few years. The railway companies at home are apparently placing smaller orders, while railway companies abroad are either out of the market for the time being or are taking an increasing proportion of their requirements from the Continent or from makers inside their own borders.

It is clear from this, and has been partly stated by business men themselves that the capacity of the industry is certainly too great for present requirements and is likely to be too great for the requirements of the next few years. And prices, it is stated, have not been a complete cover of charges for some time. Their attitude in face of this is the characteristic one of this Area. They are keeping their plant up to an efficient level, one firm in fact is putting through a fairly vigorous process of reorganization with the aim of trying to gain a footing in certain foreign markets now mainly held by France—and are waiting for a series of bankruptcies to reduce the industry to an appropriate size.

The position of the worker, therefore, can hardly be comfortable. In 1930, which was a year of maximum employment, 1,327 persons were unemployed—a percentage of 23.8. In the country as a whole in that year the percentage was 15.5. If then the Area had had only the country percentage of unemployment it would have had an unemployment roll of only 866. The position may be summed up therefore in the two statements that in the year of maximum activity there were 1,327 workers for whom it could find no employment, and that on the basis of the measurement of redundancy adopted in this report, probably here again a serious under-statement of the true position—there must be no fewer than roughly 460 who must be regarded as redundant.

(viii) The Problem of Redundancy Reviewed.

In the preceding sections an attempt was made to meet some of the difficulties of assessing the extent of labour redundancy in Engineering by considering what might be taken as the minimum of redundancy. This was done by taking the difference between the Area percentage of unemployment and that of the country. It seems though, in retrospect, as though this measure creates as many problems as it solves. Suitable enough, it would seem in General Engineering, it is definitely dubious in the other classes of engineering for there would appear to be a likelihood of considerable redundancy in these sections in other parts of the country. Further, in Marine Engineering a considerable diminution in the number attached to the industry has already taken place. While we give below therefore (Table A of this section) the assessment of redundancy on this basis, it seems desirable to attack the problem from an entirely different angle. This is done by considering the employment yielded by each trade in 1929 or, where a later year yielded greater employment than 1929 then the employment figure of that year, and comparing this with the estimate of the insured in these trades in 1931. We have then a clear picture of the maximum employment afforded by these trades in the late post-war period and of the number of workers amongst whom it must be shared. This picture is given in Table B of this section. It shows us that the total number for whom employment was found was 66,711 as against 77,140 who were in search of it. On the showing of the data of previous sections of this Report, and on the opinions given by business men themselves, it does not appear likely that the next few years will provide a sufficient level of activity of take off more of them than were needed in 1929. This then is the mass amongst which the redundant labour will be found. Narrowing our discussion to those five trades only of which detailed examination was made in preceding sections it seems clear that the measure of redundancy lies between 4,000 and 8,000 workpeople. We have already given our opinion on the inadequacy of the first. It remains then to consider the second. It is probably much nearer the mark. It shows, it must be emphasised, the number of workpeople left without work in a year which the business men in these sections of industry considered good. This being so it would clearly be invalid to apply an average percentage of unemployment to this residue since this would be to apply a factor expressive of *bad* years and *good* years combined. The only relevant factor is clearly that which may be regarded as expressive of the labour undemanded even in years of relatively great activity. It will therefore be relatively low, but *how* low is a matter difficult to decide. In the years 1911-14 inclusive the average trade union unemployment percentage in Engineering, Shipbuilding, and Metals combined was 3.1. If then these five Area trades be granted only that percentage on the insured population recorded in Table B (a) they should

have only approximately 2,000 workers unemployed. On the other hand we have been informed by some that in the post-war period we must accept as "normal" an average level of unemployment greater than the "normal" of the pre-war period, though whether behind this is the idea of a protracted redundancy is not always made clear. If, however, our pre-war experience and charting of unemployment may still be taken as a guide, and if behind the post-war average level of unemployment is a redundancy which it is desirable to eliminate because it is not called for by the normal or ordinary working of the economic system, then it is difficult to avoid the conclusion, reluctant as one may be to commit oneself to the misleading definiteness of a figure, that roughly 6,000 workers of the 8,565 listed in Table B (a) are not required.

TABLE A.—*Summary Table relating to Assessment of Redundant Labour.*

Trade.	Actual Unemployed.	Unemployed they would have had on basis of country percentage of unemployment.	Difference: A minimum measure of redundancy.
General Engineering —	5,496	2,751	2,745
Electrical Engineering —	493	430	73
Marine Engineering —	2,223	1,617	796
Constructional Engineering	951	653	298
Stove, Grate, Pipe, and General Iron Founding.	1,227	866	461
Total — —	10,590	6,307	4,283

TABLE B.—*Number employed in 1929 in certain engineering trades (or where greater in later years than that later year) and number insured in 1921.*

Trade.	(a)		Difference (2-1).
	No. Employed.	No. Insured. 1921.	
	(1)	(2)	
General Engineering... — —	25,764	29,450	3,686
Electrical Engineering — —	5,221	6,130	909
Marine Engineering — —	16,267	15,020	1,753
Constructional Engineering... — —	5,230	5,900	640
Stove, Grate, Pipe, and General Iron Founding.	4,263	5,640	1,577
Total — — —	56,835	65,400	8,565
	(b)		
Motor Vehicles, Cycles, and Aircraft	2,432	2,710	278
Carriages and Carts — — —	377	400	63
Railway Carriages, Wagons, etc. — —	1,947	1,970	23
Total — — —	4,756	5,140	384

(e)

Trade.	No. Employed.	No. Insured.	Difference.
	(1)	1931.	(2—1).
Electrical Wiring and Contracting...	560	730	170
Electric Cables and Lamps ...	493	640	147
Hand Tools and Cutlery ...	108	120	12
Bolts, Nuts, and Rivets ...	284	340	56
Brass and Allied Metal Ware ...	139	170	31
Heating and Ventilating Engineering	306	330	24
Watches and Clocks ...	139	150	11
Others... ..	3,091	4,120	1,029
Total	5,120	6,600	1,480

(d)

(a, b, c) taken together to show all Engineering and Metal Working Trades.

a	56,835	65,400	8,565
b	4,756	5,140	384
c	5,120	6,600	1,480
Total	66,711	77,140	10,429

APPENDIX A.—STATISTICAL TABLES.

I.—Changes in Numbers of Employed Persons.

		Number 1923.	Index.					Number 1930.
			1923.	1924.	1927.	1929.	1930.	
Motor Vehicles, Cycles, and Air- craft	Gt. Britain	172,283	92	100	114	121	113	212,888
	N.E. Area	1,979	94	100	107	115	111	2,342
Carriages and Carts	Gt. Britain	24,047	103	100	79	74	72	16,796
	N.E. Area	579	132	100	98	80	86	377
Railway Carriages and Wagons, etc.	Gt. Britain	48,183	97	100	103	100	98	48,600
	N.E. Area	2,069	218	100	194	205	173	1,647

II.—Changes in Numbers of Employed Persons.

		Number 1923.	Index.					Number. 1930.
			1923.	1924.	1927.	1929.	1930.	
Electrical Wiring and Contracting	Gt. Britain	9,835	86	100	113	132	143	16,370
	N.E. Area	387	106	100	133	127	133	487
Electric Cables, Lamps, etc.	Gt. Britain	64,927	93	100	111	129	136	94,207
	N.E. Area	453	100	100	74	54	52	236
Hand Tools, Cut- lery, etc.	Gt. Britain	25,102	93	100	105	107	94	25,449
	N.E. Area	167	115	100	74	49	75	108
Bolts, Nuts, and Rivets	Gt. Britain	24,620	101	100	94	94	89	21,734
	N.E. Area	79	31	100	101	110	76	196
Brass and Allied Metal Ware	Gt. Britain	25,724	99	100	100	100	94	23,702
	N.E. Area	213	147	100	143	96	80	116
Heating and Ven- tilating Engineer- ing	Gt. Britain	4,887	93	100	130	159	160	8,399
	N.E. Area	261	97	100	93	113	85	230
Watches, Clocks, etc.	Gt. Britain	42,774	103	100	96	93	89	36,994
	N.E. Area	267	147	100	81	77	59	107
Metal Trades not Separately Specified	Gt. Britain	146,429	92	100	106	110	107	169,721
	N.E. Area	2,695	95	100	91	103	109	3,087

III.—Changes in Numbers of Unemployed Persons.

		Number 1923.	Index.					Number 1930.
			1923.	1924.	1927.	1929.	1930.	
Motor Vehicles, Cycles, and Air- craft	Gt. Britain	18,147	126	100	90	103	223	32,092
	N.E. Area	311	141	100	107	103	153	338
Carriages and Wagons	Gt. Britain	3,753	154	100	61	58	83	2,034
	N.E. Area	81	87	100	68	55	68	63
Railway Carriages, etc.	Gt. Britain	2,187	85	100	109	190	206	5,280
	N.E. Area	121	121	100	226	153	363	363

IV.—Changes in Numbers of Unemployed Persons.

		Number 1923.	Index.					Number 1930.
			1923.	1924.	1927.	1929.	1930.	
Electrical Wiring and Contracting	Gt. Britain	1,955	178	100	88	107	171	1,880
	N.E. Area	123	186	100	132	131	143	93
Electric Cables, Lamps, etc.	Gt. Britain	7,103	131	100	116	79	153	8,303
	N.E. Area	107	126	100	109	86	122	104
Hand Tools and Cutlery	Gt. Britain	4,838	106	100	128	100	212	9,701
	N.E. Area	23	51	100	73	109	93	42
Bolts, Nuts, Rivets, etc.	Gt. Britain	5,100	160	100	74	73	143	4,546
	N.E. Area	101	142	100	82	93	175	124
Brass and Allied Metal Ware	Gt. Britain	6,676	145	100	59	47	102	4,718
	N.E. Area	47	134	100	66	31	69	24
Heating and Ventila- ting Engineer- ing	Gt. Britain	413	91	100	108	83	181	821
	N.E. Area	29	145	100	200	120	200	40
Watches, Clocks, etc.	Gt. Britain	6,376	102	100	61	47	90	5,625
	N.E. Area	43	73	100	56	19	39	23
Metal Trades not Separately Speci- fied	Gt. Britain	17,911	100	100	80	80	177	31,609
	N.E. Area	385	86	100	93	79	122	543

V.—Variation of Percentages of Unemployed.

		Number Insured 1923.	Percentage Unemployed.					Number Insured 1930.	Av.
			1923.	1924.	1927.	1929.	1930.		
Motor Vehicles, Cycles, and Aircraft	Gt. Britain	190,430	9·5	7·1	5·7	6·1	13·1	244,980	8·3
	N.E. Area	2,290	13·6	9·5	9·4	8·6	12·6	2,680	10·7
Carriages and Wagons	Gt. Britain	27,800	13·5	9·9	7·3	7·6	10·8	18,830	9·8
	N.E. Area	660	12·2	17·5	12·8	12·9	14·3	440	13·9
Railway Car- riages, Wag- ons, etc.	Gt. Britain	50,370	4·4	4·9	5·2	9·0	9·8	53,880	6·7
	N.E. Area	2,190	5·5	9·9	10·9	7·3	18·1	2,010	10·3

VI.—Variation of Percentages of Unemployed.

		Number Insured 1923.	Percentage Unemployed.					Number Insured 1930.	Av.
			1923.	1924.	1927.	1929.	1930.		
Electrical Wiring and Contracting	Gt. Britain	11,790	16.6	8.7	6.9	7.2	10.3	18,250	9.9
	N.E. Area	510	24.1	15.1	15.1	15.4	16.0	580	17.1
Electric Cables and Lamps, etc.	Gt. Britain	72,030	9.9	7.3	7.5	4.6	8.1	102,510	7.5
	N.E. Area	560	19.1	15.4	21.6	22.8	30.6	340	21.9
Hand Tools, Cutlery, etc.	Gt. Britain	29,940	16.2	14.6	17.1	13.6	27.6	35,150	17.8
	N.E. Area	190	12.1	23.6	23.6	40.8	28.0	150	25.6
Bolts, Nuts, Rivets, etc.	Gt. Britain	29,720	17.1	11.6	9.3	9.3	17.3	26,280	12.9
	N.E. Area	180	56.1	21.5	13.8	18.8	38.7	320	29.8
Brass and Allied Metal Ware	Gt. Britain	32,400	20.5	15.1	9.5	7.7	16.6	28,420	13.9
	N.E. Area	260	18.1	19.7	10.0	7.3	17.1	140	14.4
Heating and Ventilating Engineering	Gt. Britain	5,310	6.6	5.0	6.7	4.3	8.9	9,220	6.3
	N.E. Area	290	10.0	6.9	13.8	7.2	14.8	270	10.5
Watches, Clocks, etc.	Gt. Britain	49,150	13.0	13.1	8.7	7.1	13.2	42,620	11.0
	N.E. Area	310	13.9	24.6	18.3	8.0	17.7	130	16.5
Metal Trades not Separately Specified	Gt. Britain	164,240	10.9	10.8	7.9	7.5	15.7	201,330	10.6
	N.E. Area	3,080	12.5	13.6	13.9	10.8	15.0	3,630	13.2

VII.—*Production in Engineering, N.E. Coast, 1924.*

Trade.	Number of Returns.	Gross Output.	Net Output.	Persons employed.					Net Output per head.	Horse Power of Engines.
				Operatives.			Admini- strative Staff.	Total.		
				Males.	Females.	Total.				
		£000's	£000's						£	
Mechanical Engineering—										
Marine	29	5,873	3,043	15,889	155	16,044	2,606	18,650	163	42,240
Other	101	5,756	2,704	14,316	165	14,481	2,087	16,568	163	44,396
Total	130	11,629	5,747	30,205	320	30,525	4,693	35,218	163	86,636
		<i>7.43%</i>	<i>6.81%</i>	<i>8.07%</i>	<i>2.3%</i>	<i>7.87%</i>	<i>7.57%</i>	<i>7.35%</i>	<i>84.9%</i>	<i>9.08%</i>
Metals other than iron and steel— copper and brass melting, lead, tin, finished brass, watch and clock.	34	3,633	776	2,901	113	3,014	365	3,379	230	8,829
		<i>2.42%</i>	<i>1.46%</i>	<i>2.92%</i>	<i>0.2%</i>	<i>1.85%</i>	<i>0.78%</i>	<i>1.61%</i>	<i>91.0%</i>	<i>2.08%</i>
Other trades—including light castings, wrought iron and steel tubes, wire drawing, anchors, chains, etc., hardware, electrical engineering, cycles and motors, railway carriages.	123	4,190	1,792	6,338	925	7,263	1,437	8,700	206	17,560
		<i>1.84%</i>	<i>1.76%</i>	<i>1.68%</i>	<i>0.1%</i>	<i>1.58%</i>	<i>2.05%</i>	<i>1.65%</i>	<i>100%</i>	<i>2.54%</i>

In italics percentage relation of N.E. coast items to those of U.K.

VIII.—Production (I.H.P.) in Marine Engineering by Areas with index numbers based on 1924 = 100.

Area.	1913.	1919.	1920.	1921.	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.
Tyne ...	522,482	634,900	352,623	283,202	188,610	129,230	203,908	177,735	275,315	203,220	483,132	305,960	458,310
	266	311	173	139	93	63	100	87	135	99	237	194	225
Wear ...	198,225	163,811	126,885	63,083	47,075	34,925	91,456	54,901	22,540	112,890	117,635	109,490	111,505
	217	180	140	69	52	38	100	60	25	124	130	120	123
Tees ...	187,428	174,820	202,480	133,800	98,560	47,905	110,087	72,322	23,687	113,710	110,736	155,575	72,232
	170	159	184	122	62	44	100	65	22	104	101	142	65
Morsey ...	215,175	208,960	70,535	16,830	40,343	33,670	66,884	186,417	122,510	142,029	81,536	203,684	271,495
	322	312	105	25	60	50	100	279	183	214	122	305	406
Humber ...	60,857	56,235	49,195	33,155	4,120	12,882	16,985	27,125	16,710	14,743	30,296	53,830	46,625
	359	331	290	195	24	76	100	98	87	78	178	317	274
England ...	1,399,985	1,400,416	957,816	733,230	380,335	272,545	553,797	540,821	527,013	610,491	1,120,594	981,600	1,090,749
	253	264	173	132	69	49	100	98	95	111	202	177	197
Clyde ...	1,111,440	1,508,771	620,615	478,760	349,329	166,956	450,258	433,243	433,465	647,874	673,907	750,237	800,734
	247	335	138	106	78	37	100	96	96	144	150	167	134
United Kingdom	2,661,260	3,241,000	1,700,106	1,318,788	816,066	538,751	1,104,254	1,039,919	1,034,028	1,342,540	1,907,821	1,872,667	1,880,223
	241	294	154	119	74	49	100	94	94	122	173	170	170
The N.E. Coast (Tyne, Wear, Tees)	908,135	973,531	681,988	480,085	304,245	212,060	405,511	304,958	321,542	429,620	711,503	661,025	642,047
	224	240	168	118	75	52	100	75	79	106	175	163	158
Percentage of English Work done on N.E. Coast	64.9	66.7	71.2	65.6	80.0	77.8	73.2	56.4	61.0	69.7	63.5	67.3	58.9
Percentage of U.K. work done on N.E. Coast	34.1	30.0	40.1	36.4	37.2	39.4	36.8	29.3	31.1	32.0	37.3	35.3	34.1
Percentage of U.K. work done in England	52.6	45.0	56.3	55.6	46.6	50.6	50.5	52.0	51.0	45.9	58.7	52.4	58.0

IX.—Table showing production of I.H.P. on the North East Coast and arranged so as to display the division of output between firms which also turn out tonnage and those which do not turn out tonnage.

	1913.	1919.	1920.	1921.	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.
Total A ...	301,465	364,835	291,967	187,750	163,360	119,915	190,030	154,305	167,675	198,550	355,598	286,900	374,222
Index (1924 = 100)	159	192	154	99	86	63	100	81	88	104	187	151	197
Total B ...	607,030	608,696	390,021	292,335	140,885	82,145	215,481	150,653	153,867	231,070	355,905	374,125	267,825
Index (1924 = 100)	282	282	181	136	65	38	100	70	71	107	165	174	124
A as a percentage of Total.	33	37	43	39	54	59	47	51	52	46	50	43	58
	Pre-war	Av. 43 per cent.				Av. 52 per cent.				Av. 49 per cent.			

Av. for period = 48 per cent.

A = Firms combining production of tonnage and horse-power.

B = Firms specialising in the output of horse-power.

X.—Production in Marine Engineering.

The run of years placed above or below the line representing 1924 (100) accordingly as they are greater or less than 1924.

Tyne ...	1913	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
Wear ...	1913	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
Tees ...	1913	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
England ...	1913	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
N.E. Area ...	1913	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
United Kingdom ...	1913	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930

XI.—N.E. Coast Imports—Values—Machinery only.

	1920.	1921.	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.
Blyth and Amble	—	—	—	—	—	—	—	—	—	—
Hartlepool	—	—	—	—	—	—	—	—	—	—
Middles- brough	—	—	—	—	—	3,281	21,358	254,576	116,298	281,042
Tyne Ports	182,826	79,464	127,344	82,786	90,851	183,119	112,425	106,857	181,028	400,321
Stockton	—	—	—	—	—	1,258	21,074	26,726	8,818	30,719
Sunderland	—	—	—	—	—	—	—	—	—	—
Total £'s.	182,826	79,464	127,344	82,786	90,851	187,658	154,857	388,159	306,144	712,082
United Kingdom £000's	19,961	10,762	8,170	9,332	10,546	11,900	12,740	15,919	16,738	19,138
N.E. Area percentage	0·9	0·7	1·6	0·9	0·9	1·6	1·2	2·4	1·8	3·7

XII.—*N.E. Coast Imports—Values—Vehicles only.*

	1920.	1921.	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.
Blyth and Amble	—	—	—	—	—	—	—	—	—	—	—
Hartlepool	—	—	—	—	—	—	—	—	—	—	—
Middles- brough	—	—	—	—	—	—	—	—	—	—	—
Tyne Ports	202,044	961	3,573	2,695	674	—	—	—	—	—	—
Stockton	—	—	—	—	—	—	—	—	—	—	—
Sunderland	—	—	—	—	—	—	—	—	—	—	—
Total £'s.	202,044	961	3,573	2,695	674	—	—	—	—	—	—
United Kingdom £000's	26,904	6,868	6,561	7,429	9,038	12,166	7,240	11,684	9,368	10,583	6,228
N.E. Area percentage	0·8	0·014	0·05	0·04	0·001						

XIII.—Machinery Exports from N.E. Area as Percentage of United Kingdom Values.

	1920.	1921.	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.
Blyth and Amble	44,614	3,323	5,514	904	329	—	—	—	—	—
Hartlepool	98,174	35,481	978	149	505	17,147	21,265	181,203	4,920	8,650
Middlesbro.	671,820	869,659	379,759	428,892	527,599	552,348	301,456	331,277	541,052	436,617
Tyne Ports	546,533	531,025	211,406	196,617	440,646	353,900	259,672	408,249	412,984	580,796
Stockton...	121,167	119,379	3,143	2,067	5,735	—	—	—	—	—
Sunderland	106,212	49,940	48,333	1,700	22,680	13,256	30,530	15,232	7,681	42,249
Total £'s.	1,588,520	1,608,807	649,133	630,329	997,494	936,651	612,923	935,961	966,637	1,068,312
United Kingdom £'s.	63,458,000	74,607,000	51,539,000	44,509,000	44,783,000	49,053,000	45,538,000	49,921,000	53,722,000	54,351,000
	1,589	1,609	649	630	997	937	613	936	967	1,068
	63,458	74,607	51,539	44,509	44,783	49,053	45,538	49,921	53,722	54,351
N.E. Area percentage	2·5	2·2	1·3	1·4	2·2	1·9	1·3	1·9	1·8	2·0

XIV.—*N.E. Coast Exports—Values—Locomotives and Parts.*

	1920.	1921.	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.
Blyth and Amble	—	—	—	—	—	—	—	—	—	—	—
Hartlepool	—	—	—	—	—	—	—	—	—	—	—
Middles- brough	804,704	1,147,425	378,350	168,354	207,682	190,163	120,801	332,588	241,965	426,947	—
Tyne Ports	43,348	553,907	2,144,850	961,194	264,270	303,179	984,984	320,338	513,521	673,405	—
Stockton	—	—	—	—	—	—	—	—	—	—	—
Sunderland	—	—	—	—	—	—	—	—	—	—	—
Total £'s.	848,052	1,701,332	2,523,200	1,129,548	471,952	493,342	1,105,785	652,926	755,486	1,100,352	—
United Kingdom £'s.	7,051,741	9,552,650	6,454,042	4,027,808	2,496,139	3,250,330	3,622,336	2,889,875	4,665,624	5,268,446	4,982,766
N.E. Area percentage	12·0	17·8	39·1	28·0	18·9	15·2	30·5	22·6	16·2	20·9	

XV.—N.E. Coast Exports—Values—Carriages, Wagons and Parts. £'s.

	1920.	1921.	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.
Amble and Blyth	—	—	—	—	—	—	—	—	—	—	—
Hartlepool	—	—	—	—	—	—	—	—	—	—	—
Middlesbrough	1,122,775	654,769	206,604	207,169	380,379	223,928	454,755	161,243	268,634	404,985	—
Tyne Ports	—	—	—	—	—	—	—	—	—	—	—
Stockton...	—	—	—	—	—	—	—	—	—	—	—
Sunderland	—	—	—	—	—	—	—	—	—	—	—
United Kingdom	7,404,718	7,575,768	5,368,154	4,154,695	4,443,121	5,377,384	5,464,892	6,284,539	5,563,911	4,815,999	5,021,566
N.E. Area percentage of Total	15·2	8·6	3·8	5·0	8·6	4·2	8·3	2·6	4·6	8·4	—

XVI.—Imports of Machinery, etc., on the Tyne. (Tons.)

Source:—*Tyne Improvement Commission.*

	1924.	1925.	1926.	1927.	1928.	1929.	1930.
<i>Iron Castings—</i>							
Coastwise	133	72	22	61	53	86	56
Germany	272	80	161	173	61	11	74
Belgium	81	201	259	321	154	56	21
Holland	9	246	674	366	974	899	2,534
Sweden	199	41	108	177	123	251	156
Denmark	9	1	—	4	6	—	2
U.S.A.	41	—	18	4	—	—	17
Norway	1	10	50	3	5	4	—
B. America	15	—	—	—	—	7	—
Total	760	651	1,292	1,109	1,376	1,314	2,860
<i>Machinery—</i>							
Coastwise	1,281	1,508	1,743	2,195	3,466	2,719	2,479
Germany	178	180	443	487	383	1,542	1,967
Italy	—	—	—	—	81	54	—
Belgium	265	389	95	529	664	1,309	219
Holland	274	224	696	567	976	832	1,091
Norway	91	88	63	142	102	523	301
Sweden	349	175	104	32	1,171	664	311
Denmark	8	1,797	44	338	67	480	1,221
Turkey and Greece	—	—	182	—	—	—	—
W. Indies	—	—	—	570	—	—	—
B. America	3	13	11	16	7	43	7
U.S.A.	85	164	89	82	149	208	61
France	—	11	150	—	—	707	258
Africa	—	600	—	673	—	—	—
Total	2,534	5,149	3,620	5,631	7,066	9,081	7,915
<i>Iron Forgings and Other</i>							
<i>Ironwork—</i>							
Coastwise	478	776	163	937	1,904	1,015	586
Germany	672	2,089	1,960	3,054	1,969	2,290	1,992
Belgium	2,922	2,590	2,632	888	683	951	540
Holland	862	2,159	1,683	2,551	1,267	1,046	428
France	—	37	—	—	—	—	—
Norway	12	6	8	48	31	60	75
Sweden	184	367	38	359	408	73	118
Denmark	205	126	—	101	581	172	—
B. America	3	12	12	5	6	—	1
U.S.A.	49	47	14	25	22	37	21
Spain	—	—	1	—	—	—	—
Total	5,387	8,209	6,511	7,968	6,871	5,644	3,761
<i>Nails, Nuts, Bolts, and Screws—</i>							
Coastwise	—	—	—	4	15	28	36
Germany	—	—	—	162	261	169	271
Belgium	—	—	—	2,102	2,459	2,758	2,404
Holland	—	—	—	549	555	507	512
Norway	—	—	—	2	2	—	1
U.S.A.	—	—	—	12	—	9	3
Total	—	—	—	2,831	3,292	3,471	3,227

XVI.—Imports of Machinery, etc., on the Tyne. (Tons.)—*contd.**Source:—Tyne Improvement Commission.*

	1924.	1925.	1926.	1927.	1928.	1929.	1930.
<i>Steel Castings—</i>							
Coastwise	25	26	26	22	34	83	52
Germany	269	6	25	—	—	25	2
Belgium	1	1	—	127	79	373	252
Holland	13	53	83	98	5	—	28
Denmark	3	—	—	4	2	—	—
Norway	10	—	—	8	—	—	—
U.S.A.	—	1	—	—	—	—	—
Total	321	87	134	259	120	481	334

Steel Forgings and Manufactures—

Coastwise	125	139	35	229	83	222	531
Germany	212	365	161	1,093	874	568	1,003
Belgium	3,756	1,278	825	3,417	1,532	2,342	2,304
Holland	1,749	969	356	194	479	600	349
Norway	108	32	82	36	23	67	6
Sweden	1,362	152	40	147	19	20	31
Denmark	290	387	55	673	1	46	—
Latvia	40	—	—	—	—	—	—
B. America	1	3	50	15	15	9	32
U.S.A.	35	37	4	20	3	5	28
Total	7,678	3,362	1,608	5,824	3,029	3,879	4,284

XVII.—Exports of Machinery, etc., on the Tyne. (Tons.)

Source:—Tyne Improvement Commission.

	1924.	1925.	1926.	1927.	1928.	1929.	1930.
<i>Guns and Armaments—</i>							
Coastwise	107	172	478	1,403	363	21	1,414
Spain	66	—	—	—	—	—	—
Portugal	9	—	—	—	—	—	—
Norway	1	1	—	1	1	—	4
Belgium	—	70	—	—	—	—	—
France	—	4	5	—	—	—	—
Holland	—	—	2	3	—	—	—
Sweden	—	—	—	1	—	—	—
South America	—	—	—	205	—	—	53
Denmark	—	—	—	—	20	21	—
Australia and N. Zealand	—	—	—	—	—	—	148
Total	183	247	485	1,613	384	42	1,619

XVII.—Exports of Machinery, etc., on the Tyne. (Tons.)—*contd.**Source:—Tyne Improvement Commission.*

	1924.	1925.	1926.	1927.	1928.	1929.	1930.
<i>Iron Castings—</i>							
Coastwise	9,266	8,400	8,116	7,369	11,591	8,674	4,833
Germany	2	3	5	6	3	5	18
Belgium	2	4	8	14	—	1	19
Holland	2	14	8	7	2	1	34
Norway	966	1,117	1,036	1,529	1,867	1,916	1,196
Sweden	4	25	10	1	25	7	13
Denmark	14	27	87	79	69	64	42
B. America	137	88	1	—	—	2	—
S. America	75	—	—	—	—	—	7
Italy and Malta	—	—	—	3	—	—	—
Turkey and Greece	—	—	—	7	—	—	—
East Africa	—	—	—	—	—	—	15
Total	10,468	9,678	9,271	9,015	13,557	10,670	6,177

Machinery—

Coastwise	1,232	1,898	7,593	4,316	3,336	4,860	5,527
Germany	19	20	119	201	384	143	441
Belgium	196	217	190	208	702	685	865
Holland	453	1,004	1,000	1,076	1,062	1,147	865
France	51	5	10	946	5	436	2
Italy and Malta	160	147	2	46	967	421	134
Norway	292	655	637	596	806	1,101	948
Sweden	357	609	433	452	543	627	572
Denmark	307	186	181	422	677	422	395
Jugo Slavia and Roumania	—	—	—	—	—	1	11
Turkey and Greece	44	16	6	399	18	—	10
Algeria and Egypt	—	—	—	—	14	58	63
East Africa and Mauritius	1,545	285	1,657	217	247	242	362
South and West Africa	—	—	—	2	—	—	127
B. America	2,868	298	131	502	87	523	51
U.S.A.	125	3	14	2	14	33	8
South America	2,758	11	4,559	9	22	44	183
Latvia	—	—	—	7	—	—	—
Australia and N. Zealand	—	—	4,401	73	—	—	—
Iraq, Aden and Persia	—	—	—	—	—	—	52
East Indies, China	128	5,314	3,124	—	10	2	322
Portugal	—	2	34	—	—	—	—
Spain	12	48	—	—	9	21	—
Total	10,547	10,718	24,091	9,474	8,903	10,766	10,938

XVII.—Exports of Machinery, etc., on the Tyne. (Tons.)—*contd.**Source:—Tyne Improvement Commission.*

	1924.	1925.	1926.	1927.	1928.	1929.	1930.
<i>Anchors and Chains—</i>							
Coastwise	834	11	24	9	—	49	7
Belgium	13	23	25	26	11	44	16
Holland	48	98	20	109	2	10	12
Norway	322	487	278	202	270	512	543
Sweden	46	15	42	27	51	94	46
Denmark	59	20	8	22	26	83	83
B. America	1	51	7	9	2	123	7
Italy and Malta	—	—	—	99	8	7	—
Turkey and Greece	—	1	—	5	—	2	—
Germany	27	46	26	—	2	—	—
Portugal	—	—	—	—	1	—	—
East Africa and Mauritius	—	—	—	—	2	—	—
South America	—	—	—	26	1	—	—
West Indies	—	—	9	—	—	—	—
Total	1,350	752	439	534	376	924	714

Bolts, Nuts, Nails, and Ironwork—

Coastwise	81	511	348	634	1,145	570	819
Germany	1	4	31	7	9	9	10
Belgium	12	4	6	2	10	—	12
Holland	13	49	78	77	10	12	20
France	1	—	—	2	—	2	—
Italy and Malta	7	19	4	—	1	—	2
Spain	9	14	1	—	—	—	—
Norway	505	326	239	390	435	691	1,168
Sweden	90	25	22	14	33	51	56
Denmark	83	101	80	153	102	110	350
Turkey and Greece	20	—	2	19	—	—	—
Africa	2	6	3	1	1	—	1
B. America	128	36	5	—	—	78	6
U.S.A.	—	—	7	5	2	—	—
South America	19	1	—	51	11	2	18
West Indies	—	—	53	49	—	—	—
East Indies, China and Japan.	—	—	—	—	—	1	—
Australia and N. Zealand	—	—	—	—	—	2	1
Total	971	1,096	879	1,404	1,759	1,528	2,463

Bridge and Girders—

Coastwise	12	—	402	196	1	—	—
Norway	—	13	—	—	—	—	—
B. America	—	—	—	130	—	—	—
Australia and N. Zealand	—	—	—	—	—	9	—
Total	12	13	402	326	1	9	—

XVII.—Exports of Machinery, etc., on the Tyne. (Tons.)—*contd.**Source:—Tyne Improvement Commission.*

	1924.	1925.	1926.	1927.	1928.	1929.	1930.
<i>Hydraulic Machinery—</i>							
Coastwise	Included under machinery until 1926.				123	—	—
<i>Locomotives and Loco Tenders—</i>							
Germany	included under machinery until 1926.			—	—	1	1
S. America				—	4,002	754	873
East Indies, China and Japan.				2,135	1,447	5,433	2,844
West Indies	—	—	—	—	—	107	—
Algeria and Egypt ...	—	—	—	—	1,708	—	—
Australia and N. Zealand	—	—	—	1,440	—	—	—
S. Africa and W. Africa...	—	—	—	1,123	411	—	—
Total	—	—	—	4,698	7,568	6,295	3,718
<i>Steel Castings—</i>							
Coastwise	17	3	2	5	—	5	11
Holland	—	—	—	—	—	—	1
Norway	1	2	1	6	1	—	18
Sweden	1	159	30	—	—	—	16
Denmark	—	9	1	2	—	3	34
B. America	15	—	—	—	—	—	—
Belgium	—	2	—	—	—	—	—
Australia and N. Zealand	—	—	8	—	—	2	—
Germany	—	—	—	—	4	—	—
Total	34	175	42	13	5	10	80
<i>Steel Forgings and Manufactures—</i>							
Coastwise	661	1,135	526	311	189	534	626
Germany	9	1	39	3	5	—	41
Holland	2	29	18	26	9	12	17
Norway	164	104	76	132	317	158	101
Sweden	4	12	20	3	38	2	15
Denmark	140	41	36	45	428	645	100
Algeria and Egypt ...	6	141	38	—	7	—	—
B. America	454	340	—	40	204	33	6
U.S.A.	86	213	24	16	8	—	129
S. America	513	88	151	39	74	617	39
Belgium	—	4	69	11	9	—	24
Italy and Malta	—	55	—	—	3	2	2
Turkey and Greece ...	—	38	—	92	4	337	3
Spain	—	—	2	15	—	—	—
East Indies, China and Japan.	—	—	1,652	—	1	363	—
West Indies	—	—	10	—	—	—	—
France	—	—	—	—	19	2	3
Australia and N. Zealand	—	—	—	—	—	26	34
Total	2,039	2,201	2,661	733	1,315	2,731	1,140

XIX. North East Coast Engineering Employers' Association.

*Index Numbers of changes in Numbers of Men and Boys (not Apprentices)
in Engineering Works, Foundries and Boilershops of Members
on the North East Coast.*

Average of Numbers in March and September, 1924=100.

<i>Year.</i>	<i>General Engineering.</i>	<i>Marine Engineering.</i>	<i>Electrical Engineering.</i>	<i>Total.</i>
1920	179	185	68	171
1921	140	151	71	138
1922	89	110	54	92
1923	78	80	70	78
1924	100	100	100	100
1925	118	84	105	107
1926	93	74	91	87
1927	95	108	106	100
1928	97	115	109	104
1929	94	128	101	105
1930	85	115	119	97
1931	62	57	126	66

APPENDIX B.

NOTE RELATING TO ELECTRICAL ENGINEERING.

By Professor W. M. THORNTON.

The North East Coast has for many years played a leading part in electrical engineering. It is the home of high speed turbine-driven electrical machinery, of the incandescent filament lamp, of the quick break switch, of metal clad switch gear and of flame proof mining apparatus. It is the centre of a great system of electrical distribution by three phase currents at high voltages, the first and largest three phase system in England and one of the largest and most economical in the world. Within the last five years marked advances have been made in the manufacture of turbo-generators at high voltages that enable the costs of transmission to be reduced by removing the necessity for the use of large and costly transformers. A machine has been developed for the testing of switch gear of immense power that is attracting the attention of continental engineers. Electric winches with a new system of speed control are being manufactured for ship and shore use, electric welding has been introduced on a large scale, a new type of variable speed motor is now being manufactured here, and on the whole there has been steady technical progress, though no such epoch-making developments as the turbo-generator or ironclad switch gear are in sight.

Work flows usually to where labour is cheap, but, when the costs of labour for a given product are compared, competent judges state that they are less here than in the Midlands. All large works on the North East Coast use electrically-driven machinery, taking their supply mostly from the Newcastle-upon-Tyne Electric Supply Company or in the case of Sunderland from the Corporation. The coal mines of the district nearly all take electric power from this Company. In one great colliery electrically-driven coal-cutters have entirely displaced the hand hewing of coal.

The management of most electrical undertakings, whether manufacturing or supply, is in the hands of comparatively young and energetic men and new ideas arising in the works are favourably entertained. There is a good deal of personal

supervision and welfare work, but though the better class of workman on the North East Coast is in skill and competence hard to beat, a good many skilled men have left the district during the depression. The organisation of some of the older firms left something to be desired. An apprentice in a very large firm of engineers who had taken first class honours in his final examination was commended to his firm with the remark that he ought to be in the research department. The reply of the firm was that they had no research department. The more progressive concerns have well equipped and staffed technical research departments but there is of necessity a good deal of routine testing to be done and there are no industrial laboratories to compare with those at Manchester or Wembley.

New and interesting developments such as the Diesel electric locomotive are being tried out on a large scale and may make for economy. Main line electrification is being brought more within the bounds of possibility by the "grid" system of electrical power distribution but is not yet in sight, and will not call for any increase in employment. New industries such as the manufacture of electric cables might well find a site here. The great overhaul of electrical installations consequent on the approaching change of frequency of the Newcastle Electric Supply Co.'s system favours such a growth, for the amount of new cable required will probably be great. The manufacture of certain forms of electrical insulation introduced a year or two ago has been actively developed but requires a large export trade in electrical plant to be fully occupied. There is scope for a progressive development of the manufacture of miners' electric lamps in the district, most of this new work now being done in the Midlands or South Wales.

With the revival of shipbuilding and the probable use of electric propulsion on a larger scale a few more men may be employed on the manufacture of electric machinery for this purpose. One of the most promising electrical developments which affects labour is the use of electric power in farming on the lines of that now in common use in Sweden and in some districts in the South. The capital for plant might be found by a central *ad hoc* bank. Electricity alone, though it may help the recovery of crops in bad seasons, and can lower the costs of ploughing, cannot save farming, but it can bring to farming districts new modes of saving heavy manual labour and leave men free for active work in other directions.

VII.—THE SHIPBUILDING AND SHIP-REPAIRING INDUSTRY.

(Memorandum by Professor H. M. Hallsworth.)

(i) Introduction—Importance of the Industry in the North East Coast Survey Area.

According to the Census of England and Wales of 1921 the number of persons of 12 years of age and over employed in the shipbuilding, ship-repairing, and marine engineering industry of the North East Coast Area was 104,631. Of this number 102,664 were men and boys, and 1,967 were women and girls. Together they formed 11.6 per cent. of the total workers in all the industries of the Survey Area; and this proportion is exceeded in the Area only by those engaged in the coal mining industry where the proportion was 26.5 per cent. The next largest group is composed of those engaged in the retail trades where the proportion was 7.5 per cent.

If, however, we compare the industries in the Area with the corresponding industries of the whole of England and Wales we find that whilst the Area has only 5.2 per cent. of the workers of the

whole country of 12 years and over, it has no less than 37.0 per cent. of those engaged in the shipbuilding, ship-repairing, and marine engineering industry of the country. From this point of view, therefore, it is the most important industry of the Area. The industries which come most closely to it in this respect are iron mining with 35.0 per cent., and coal mining and the iron and steel manufacturing trades each with 21.0 per cent.

It is of course unfortunate that the Area occupational tables of the 1931 Census are not available in time for this Report, if only to see what changes have taken place in the last 10 years. There is some evidence from other sources that there has been a considerable reduction in the number of workers attached to the industry. But there is no reason to feel that the position of the industry relatively to the other industries of the Area has undergone any material change. The shipbuilding and its allied industries remain therefore of primary importance not only to the Survey Area itself but to the country as a whole.

According to the Census of Production for 1924 the total value of vessels completed and other work of construction in that year amounted approximately to £34,573,000, whilst the value of repair work was £16,652,000, a total of £51,225,000 for Great Britain, excluding Northern Ireland. The "net output," i.e., the amount by which this figure exceeded the cost of materials, was £22,222,000.

In no other branch of economic activity, with the possible exception of the textile industries, was the superiority of Great Britain prior to the War quite so marked as in shipbuilding. Though many of the materials employed, both in shipbuilding and marine engineering, were imported to a considerable extent, the industry continued to enjoy a fairly constant proportion—roughly 60 per cent.—of the world's order for ships.

The five years prior to the War were years of prosperity, following on a serious slump in 1908 and 1909. The construction of ships for British owners was given almost entirely to British yards, the amount of construction of warships, both for our own and other Governments, was considerable, and of the tonnage of merchant shipping being built throughout the world for other than British owners we were constructing about 26 per cent.

(ii) The Position of British Shipbuilding since the War.

The purpose of this investigation is to ascertain what is the position since the War of the shipbuilding industry in this country, and especially on the North East Coast; how that position has been brought about; how it compares with the position of the industry both prior to the War and to the position in, say, the year 1924; and what are the prospects of the industry in the immediate future.

But before going into a detailed study of the post-war position of the shipbuilding industry it will be necessary to bear in mind several

general reasons why the industry is in difficulties at the present time, quite distinct from the difficulties experienced by most industries due to the depression in world trade.

In the first place, in order to meet national needs during the War, the shipbuilding capacity of the country had to be considerably increased. At the end of the War, therefore, the output capacity of the industry was much greater than it was prior to the War. Moreover, this capacity was increased still further in order to meet the immediate post-war demand for merchant tonnage. It is probable that the increase in capacity of British yards immediately following the War was greater than the increase during the War, but on this point we can give no definite information. Hence when the end of the post-war boom came in 1921 the shipbuilding industry of this country was on a much larger scale than it was prior to the War.

Secondly, partly as a result of international agreements for the limitation of armaments and partly as a result of the necessity of cutting down national expenditure, the demand for the construction of warships has been very greatly reduced.

Thirdly, as a consequence of the Peace Treaty, there was the transference of a large volume of reparations tonnage to British ownership during the years 1919 to 1922. The amount so transferred was slightly over two million tons which is equivalent to about the normal output of one and a half post-war years.

It will thus be seen that whilst capacity had been greatly increased the demand for new ships was greatly decreased. Moreover owing to the fact that British yards during the War had to concentrate on production of vessels for our own needs many important and valuable connections with customers abroad were permanently lost to British shipbuilders, whilst it led at the same time to the introduction and expansion of shipbuilding in other countries.

In some respects, therefore, the shipbuilding industry of this country has had a more difficult task than most other British industries in trying to adjust itself to post-war conditions. That task would have been a difficult one even had the general economic conditions of the post-war period been less adverse than in fact they have been. It will, we think, be found on a review of the post-war period that the industry has faced its difficulties with a greater measure of success than might have been expected, though the cost, both to capital and labour in the industry, has been very great indeed.

We propose to look first at the magnitude of the industry as a world industry.

In order to measure the output of the industry three units of measurement are commonly employed, namely, (a) Tonnage laid down; (b) Tonnage under construction; (c) Tonnage launched. Each of these units has its uses for purposes of comparisons, but to measure changes in the magnitude of the output of the industry, statistics of tonnage launched are the most suited for the purpose.

Ships are, however, large units and hence the figures of tonnage launched may, for short periods, give an incomplete impression of the position, even when the period chosen is a complete year. But by taking an average of three, five, or seven years, this defect is overcome.

Let us consider Merchant tonnage first, leaving Warship tonnage for later consideration. For the purpose of this inquiry we may neglect entirely vessels of less than 100 tons gross.

(iii) World Shipbuilding.

During 1930 the total gross tonnage launched of merchant vessels of 100 tons gross and upwards—excluding warships—in the shipbuilding countries of the world amounted to 2,889,472 tons. In only eight previous years has this total been exceeded. The following table gives the peak years and their tonnages :—

<i>Year.</i>				<i>Tons.</i>
1906	...	...	...	2,919,763
1912	...	...	...	2,901,769
1913	...	...	...	3,332,882
1917	...	...	...	2,937,786
1918	...	...	...	5,447,444
1919	...	...	...	7,144,549
1920	...	...	...	5,861,666
1921	...	...	...	4,356,843

It should, however, be borne in mind that returns are not available for Germany and Austria-Hungary for the war period (1914-1918), nor for Germany for 1919 and 1920; and that since 1914 complete returns for Russia have been available only for the years 1926-1929. Nevertheless it is unlikely that statistics for these countries in the years named would materially alter the position as shown above.

It will be seen that the tonnage launched in 1919 was more than double that in the highest pre-war year, 1913. This great increase was mainly due to a greatly increased output in the U.S.A. In 1913 the tonnage launched in the U.S.A. amounted to 228,000 gross tons. But from 1917 onwards the U.S.A. made strenuous efforts to increase her output of tonnage. New shipyards were laid down, existing ones were extended, and a great effort was made in all directions to become the chief shipbuilding country of the world. In 1919, no less than 3,580,000 gross tons were launched, in 1920, 2,349,000 tons, and in 1921, 995,000 tons. But the effort quickly died down, and from 1922 to 1926 her output averaged only some 95,000 tons a year. The total world figures for 1919 and 1920 must therefore be regarded as exceptional, due chiefly, though of course, not exclusively, to a swollen output from the U.S.A.

The total gross tonnage launched each year since 1897 has varied from 1,201,638 tons in 1915 to the 7,144,549 tons in 1919. An average figure for the period in view of such a wide variation as this

would have little meaning. But taking a five-year average at the beginning, middle, and end of the period we get the following:—

	<i>Tons.</i>
Five-yearly average 1897-1901	2,053,741
" " " 1909-1913	2,488,940
" " " 1926-1930	2,468,515

The tonnage launched during the last five years shows therefore a 20 per cent. increase on the figures for the close of the last century, but a slight fall—less than 1 per cent.—compared with the five years immediately preceding the War. If, however, we take a seven-year period we find that a comparison of the seven post-war years 1923-29 with the seven pre-war years 1907-1913, shows that the world output of merchant tonnage has been reduced by 9 per cent.

(iv) British Shipbuilding.

The Output of Merchant Tonnage of 100 Tons and upwards from the Shipbuilding Centres of Great Britain and Ireland.

What position, then, does Great Britain occupy in relation to this world output of shipping tonnage? From the point of view of merchant tonnage of 100 tons and upwards launched, the year 1913 stands out as the record year for British and Irish shipbuilding in the pre-war period, amounting as it did to 1,932,153 tons. This figure has only once been exceeded in the post-war period, namely, in 1920 when no less than 2,055,624 tons were launched. In 1919, which was the record year for the world, the figure for Great Britain and Ireland was 1,620,442 tons. The lowest output during the period 1897-1930, but excluding the war year 1916, and 1926, the year of the general strike, was 645,651 tons in 1923.

The average tonnage launched in the five years, 1897-1901, was 1,340,811 tons; in the five years immediately prior to the War, 1909-1913, it was 1,521,749 tons; and in the four years, 1927-1930, it was 1,418,245 tons, which shows a decline of 6.8 per cent. compared with 1909-1913, but an increase of 5.8 per cent. compared with 1897-1901.

If we compare these figures with those already given for world tonnage launched during the same periods, we find that the proportion of world tonnage built in British and Irish yards has relatively declined, being 65.3 per cent. in the period 1897-1901, 61.1 per cent. in the period 1909-1913, and only 53.2 per cent. in the period 1927-1930.

During the War our export of ships had, of course, to be suspended. The whole of our shipbuilding resources were required to meet our own needs, for the building of warships and later of merchant tonnage to replace our losses due to the submarine warfare. The inevitable result was that a great impetus was given to shipbuilding in other countries. We shall have to return to this point

later. The immediate result was, however, a big fall in the proportion of world tonnage built in this country, and this is clearly reflected in the years following the War.

Year.	Merchant tonnage of 100 tons and upwards.		Proportion per cent. (2) as percentage of (1).
	World tonnage launched (1)	Great Britain and Ireland tonnage launched (2)	
1919 ...	7,144,549	1,620,443	22.7
1920 ...	5,861,666	2,055,624	35.1
1921 ...	4,356,843	1,538,052	35.4
1922 ...	2,467,064	1,031,081	41.7
1923 ...	1,643,181	645,651	39.4
1924 ...	2,247,751	1,439,885	64.0
1925 ...	2,193,404	1,084,633	49.3
1926 ...	1,674,977	639,568	38.3
1927 ...	2,285,679	1,225,873	53.7
1928 ...	2,699,239	1,445,920	53.7
1929 ...	2,793,210	1,522,623	54.5
1930 ...	2,889,472	1,478,563	51.2

Due caution, however, must be exercised in interpreting the percentage proportions in the above table. The year 1919—largely due to the intervention of the U.S.A., already referred to—was exceptional, and the low percentage figure of 22.7 may therefore be neglected. Moreover, the high percentage of 64 in 1924 was chiefly due to large arrears of work caused by a trade dispute with the Boilermakers' Society, which lasted from April to November, 1923. Apart from these two corrections we may take it that whilst Great Britain's proportion of world output of merchant tonnage was over 60 per cent. in the immediate pre-war period, it was only 35 to 40 per cent. in the post-war boom. From that period the proportion of this country of merchant tonnage launched has increased until in the year 1929 it reached 54.5 per cent. Since 1929, as we shall see later, there has been a marked change for the worse. But the point is worth noting that the above figures show that in the period 1923-1929 British shipbuilders succeeded in recovering, to some extent at least, their pre-war position in the shipbuilding industry of the world. This is the more surprising when we take into account not only the adverse conditions at home, but the great expansion of the industry abroad during the years of the War and of the post-war boom. It is but reasonable to assume that, in the majority of cases at least, the lay-out and the equipment of the yards of our foreign competitors would be of the most up-to-date kind; and that they would therefore be better able to compete with British shipbuilders than before the War. The fall in the proportion of 61.1 per cent. in the five years immediately prior to the War to the proportion of 53.2 per cent. in the period 1927-1930 must therefore be considered in relation to the events of the War and of the immediate post-war period.

(v) North East Coast Shipbuilding.*The Output of Merchant Tonnage of 100 Tons and upwards from the Ports of the North East of England.*

The ports in this Area are (a) Blyth, Newcastle and the Tyne; (b) Sunderland; (c) The Hartlepoons; (d) Stockton, Middlesbrough, and Whitby.

Figures of merchant tonnage for this group of ports are available only from 1900 onwards, since the figures for earlier years, as given in the Returns of Lloyd's Register, include warships.

The highest tonnage launched at these ports, taken together, was in 1906 when it amounted to 1,005,148 tons, the next highest years being 1911 with 977,278 tons, and 1913 with 974,109 tons. In 1920, the record year for British shipbuilding, only 948,902 tons were launched at these ports. The lowest tonnage recorded in the period 1900-1930 was 255,542 tons in 1923, but as we have already seen, output in this year was reduced owing to a trade dispute.

The average yearly tonnage launched at the North East ports in the five years 1900-1904 was 724,190 tons; in the five years 1909-1913 immediately prior to the War it was 770,638 tons; and in the four years 1927-1930 it was 624,028 tons. The North East ports, therefore, show a decline in the output of merchant tonnage in recent years as compared with either of the two former periods of 13.9 and 19.1 per cent. respectively.

If we turn to consider what proportion of British and Irish shipping was launched at North East ports we find that the average proportion in the five years 1900-1904 was 51.0 per cent.; in the five years 1909-1913 it was 50.7 per cent.; and in the four years 1927-1930 it was 44.0 per cent.

The following table shows the proportions for the years since the War:—

Year.	Merchant tonnage of 100 tons and upwards launched.		Proportion per cent. (2) as percentage of (1).
	Great Britain and Ireland (1)	North East Ports (2)	
	Tons.	Tons.	
1919 ...	1,620,442	716,295	44.2
1920 ...	2,055,624	948,902	46.2
1921 ...	1,538,052	662,753	43.1
1922 ...	1,031,081	432,137	41.9
1923 ...	645,651	255,542	39.6
1924 ...	1,439,885	631,258	43.8
1925 ...	1,084,633	382,855	35.3
1926 ...	639,568	198,979	31.1
1927 ...	1,225,873	567,197	46.3
1928 ...	1,445,920	641,120	44.3
1929 ...	1,522,623	679,321	44.6
1930 ...	1,478,563	608,472	41.2

There has therefore been a decline in the proportion of merchant shipping launched from the ports of the North East Coast since the War in comparison with the rest of the shipbuilding centres of the country. It will be necessary at a later stage of the enquiry to investigate in detail the reasons for this decline, a decline which is not merely relative, but absolute. But we shall be in a better position to do this when we have analysed the output figures for each of the ports in the Area. We therefore turn to consider these figures.

The Output of Merchant Tonnage of 100 Tons and upwards from each of the North East Ports.

In considering the four groups into which the North East ports are classified we must bear in mind that up to and including 1915 Whitby was included with the Hartlepoons, but since that year it has been included in Lloyd's Register statistics with Stockton and Middlesbrough. Since, however, the tonnage launched at Whitby is in any year but a small proportion of the whole of either group, this change in the classification makes a difference so small that it may for most purposes be neglected. The figures for Blyth are included throughout with Newcastle and the other Tyne ports.

A comparison of the tonnage launched at each of the group of ports in the North East Area in the period 1900-1930 shows that Blyth and the Tyne ports have increased in relative importance as shipbuilding centres within the group of North East ports, Sunderland has kept a fairly steady proportion, whilst both the Hartlepoons and Middlesbrough and Stockton show a relative decline. This fact is more clearly brought out if we compare the average percentage proportions for the four years 1900-1903, the four years, 1910-1913, immediately preceding the War, and the last four years, 1927-1930. The figures are as follows :—

Group.	1900-1903 Percentage Proportion of N.E. Ports.	1910-1913 Percentage Proportion of N.E. Ports.	1927-1930 Percentage Proportion of N.E. Ports.
Blyth, Newcastle and the Tyne.	35·9	38·0	46·9
Sunderland	31·6	31·4	31·6
Middlesbrough and Stockton.	17·1	16·1	12·9
The Hartlepoons	15·4	14·5	· 8·6

If, however, we are to see the real changes in the absolute position of each port we must take the actual tonnages. Averaging the

tonnages launched in each of the above three periods we get the following figures :—

Group.	1900-1903 (1).	1910-1913 (2).	1927-1930 (3).	Percentage Increase or Decrease.	
				(3) of (1)	(3) of (2)
Blyth, Newcastle and the Tyne.	264,588	325,194	292,479	+ 10.5	— 10.0
Sunderland	233,008	267,990	197,308	— 15.3	— 26.4
Middlesbrough and Stockton.	126,282	137,250	80,441	— 36.3	— 41.4
The Hartlepoons ...	113,466	124,162	53,799	— 52.6	— 56.7
Total, N.E. Ports ...	737,343	854,596	624,027	— 15.4	— 27.0
The Clyde	410,680	524,784	504,654	+ 22.9	— 3.8
All Ports, Great Britain and Ireland.	1,396,347	1,654,420	1,418,245	+ 1.6	— 14.3
The World	2,392,522	2,710,661	2,666,900	+ 11.5	— 1.6

The above table shows, first, that the North East Coast has suffered a greater diminution of output than the Clyde, or the rest of the ports of Great Britain and Ireland.

It is difficult to explain why this should have been the case. In fact, from one point of view we should have expected the reverse. The North East Coast has established a special position in the building of Oil Tankers, the first of which was built in 1886. During the four quarters from December, 1929, to September, 1930, the merchant tonnage of all kinds of vessels under construction at British yards for foreign owners rose to an average each quarter from a previous level of about 150,000 tons, to an average of 432,800 tons, or 31.4 per cent. of the whole tonnage under construction in British yards. This peak of foreign orders was largely due to orders for Tankers. Of the Tankers launched in 1930 the North East Coast accounted for 51 of a total tonnage of 361,223 tons out of the British total of 77, of a total tonnage of 550,475 tons, or a world total of 119 vessels of a total tonnage of 889,865 tons. The following table shows the position of the North East Coast for the years 1921 to 1930 in relation to the Clyde, Great Britain, and the world in the building of Oil Tankers.

Numbers and Tonnage of Steam and Motor Oil Tankers of 1,000 tons and upwards launched.

Year.	N.E. Coast.		The Clyde.		Great Britain and Ireland.		The World.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
1921	20	158,418	10	44,646	38	250,868	151	1,050,356
1922	25	153,752	6	40,030	42	262,826	61	355,854
1923	5	30,510	1	6,600	9	58,188	23	126,181
1924	10	58,248	3	7,898	13	65,005	31	116,025
1925	8	55,894	7	46,450	24	134,766	48	286,869
1926	11	60,820	5	33,740	19	100,020	41	246,497
1927	36	181,698	13	76,825	62	305,781	99	542,437
1928	30	175,673	14	103,644	51	300,348	99	646,851
1929	13	91,596	6	49,117	25	175,009	49	324,870
1930	51	361,223	18	132,713	77	550,475	119	889,865
Totals 1924-30	159	985,052	66	450,387	271	1,631,404	486	3,053,414
Yearly Average 1924-30.		140,722		64,341		233,058		436,202
Percentage of British Total.		60·4		27·6		—		—
Percentage of World Total.		32·3		14·75		53·4		—

Thus, the North East Coast during the last seven years has built nearly two-thirds of the Tanker tonnage launched in this country, and very nearly one-third of that of the world. In the building of Tankers, the North East Coast far outstrips the Clyde; just as the Tyne outstrips the rest of the North East ports. The following table shows the output of the four centres during the seven years 1924-1930.

Output of Tankers from North East Ports, 1924-1930.

	<i>Number.</i>	<i>Tonnage.</i>	<i>Average Yearly Tonnage.</i>
Blyth and Tyne ...	118	707,381	101,054
The Wear	23	141,769	20,253
The Tees	18	135,902	19,415
The Hartlepoons ...	Nil.	Nil.	Nil.

It may be noticed that in this period, 1924-1930, our chief competitors in the building of tankers have been Sweden (especially for motor tankers), Germany, Holland, and the U.S.A.

Our inquiries have failed to reveal any really satisfactory reason for the decline of the North East Coast, relative to the Clyde. The output of tonnage in the four years, 1927-1930, is still some 120,000 tons a year greater than the output from the Clyde; but in the four pre-war years, 1910-1913, as well as in the years 1900 to 1903, it was about 330,000 tons a year greater. It is possible, as more than one North East Coast shipbuilder has suggested to us,

that the change is a temporary one, and that in a few years the pendulum may swing the other way.

Coming now to the distribution of work within the Area, it has been suggested to us by one authority that the Wear has maintained her proportion of tonnage because of the existence of family connections between owners and builders. If this be so it may explain in part why the proportions of the Hartlepoons, and possibly of Middlesbrough and Stockton have relatively declined. There appears to be a tendency for the number of ship-owning firms on the North East Coast to diminish; or to put it in another way, for ship-owning to go to London. This is particularly marked at the Hartlepoons where prior to the War there were 30 shipowners and now there are but three. It is possible therefore that loss of a local connection may account for some of the loss of orders there, and possibly on the whole of the North East Coast. Local builders on the Tees and at the Hartlepoons however do not, we gather, attach much importance to this point. Nevertheless local ties between builders and owners have been strong in the past in the North East and, though few British owners ask for quotations from foreign builders in the case of ordinary cargo boats, there have been one or two cases recently where North East Coast owners have placed orders for new ships in Scotland; and it is therefore possible that the migration of ship-owning firms from the North East to London may increase the tendency to go to other centres for their ships.

A possible reason is that some of the yards at Middlesbrough, Stockton, and the Hartlepoons have failed to keep pace with the times, and both in organization and equipment compare somewhat unfavourably with most of the yards on the Tyne. If this be the case it may be traceable to the fact that at the former ports the number of private firms is proportionately higher than on the Tyne, and that they have been less able or less willing to spend money on reconstruction and re-equipment than the public joint-stock companies on the Tyne. This may also have been the case, though to a slighter extent, with the private firms on the Wear. Reconstruction could only be undertaken in face of serious financial difficulties which many private firms have been unable to overcome.

(vi) Tonnage built for British and Foreign Owners.

Changes in the Tonnage of Merchant Vessels built in this country for British Shipowners, for British Dominions, and for the rest of the world.

It is important for this inquiry to see what proportion of the merchant tonnage launched in the shipbuilding yards of Great Britain and Ireland is intended for shipowners in this country, and what proportion goes to the British Dominions and to foreign countries; and to note what changes, if any, have these proportions undergone in recent years.

The following table gives the average yearly tonnage and the average proportions for the years 1900-1903, 1910-1913, and 1927-1930 :—

	Average Yearly Gross Tonnage Launched.	Average Yearly Tonnage for Great Britain and Ireland.	Per cent.	Average Yearly Tonnage for British Dominions	Per cent.	Average Yearly Tonnage for Rest of World.	Per cent.
1900-1903	1,396,347	1,096,077	78·5	30,322	2·2	269,948	19·3
1910-1913	1,654,420	1,288,894	77·9	53,392	3·2	312,134	18·9
1927-1930	1,418,245	1,050,633	74·1	87,193	6·1	280,419	19·8

These figures are significant. We have already noticed that in spite of the impetus given to foreign shipbuilding during the War and the expansion of shipbuilding yards and facilities in other countries British shipbuilders had restored their proportion of world output to over 50 per cent. We now see that the tonnage built for the British Dominions during the last 30 years has been nearly trebled, and the tonnage for the rest of the world, though less than immediately prior to the War, is yet higher than it was 30 years ago. It has, however, to be remembered that the world output of merchant tonnage has increased some 20 per cent. since 1900, and therefore the above figures, encouraging as they are in most respects, go to show that this country is not building quite so large a proportion of merchant tonnage for foreign countries as it did 30 years ago. Nevertheless the actual position is better in this respect than has, sometimes, been thought to be the case.

(vii) Changes in the Size of Merchant Vessels Launched during the last 30 years.

Classifying merchant vessels launched into three classes, (a) under 4,000 tons, (b) 4,000 to 8,000 tons, and (c) over 8,000 tons, we get the percentage proportions of the three classes for the three periods shown in the following table. Corresponding figures for the tonnage built abroad are not available until 1918.

	Great Britain and Ireland.						Abroad.					
	Average number under 4,000 tons gross.	Per cent. of total.	Average number 4,000-8,000 tons gross.	Per cent. of total.	Average number over 8,000 tons gross.	Per cent. of total.	Average number under 4,000 tons gross.	Per cent. of total.	Average number 4,000-8,000 tons gross.	Per cent. of total.	Average number over 8,000 tons gross.	Per cent. of total.
1900-1903	562	82·4	106	15·5	14	2·1	—	—	—	—	—	—
1910-1913	479	71·7	164	24·6	25	3·7	—	—	—	—	—	—
1927-1930	292	62·9	145·75	31·5	26	5·6	341	75·2	72·5	16·1	40	8·7

The first part of the table shows quite clearly that during the last 30 years the average size of merchant ship built in this country has increased. The proportion of vessels of from 4,000 to 8,000 tons has doubled, whilst the proportion of vessels over 8,000 tons has increased over two and a half times. The British proportion of vessels of the middle class is double that of the foreign yards, but the latter's proportion of vessels over 8,000 tons is greater than our own. We may, however, analyse this in another way. If we take the percentage of the world output of merchant ships of the three categories which was built in Great Britain and Ireland we get the following figures:—

	<i>Under 4,000 Tons.</i>			<i>4,000 to 8,000 Tons.</i>			<i>Over 8,000 Tons.</i>		
	<i>World.</i>	<i>Great Britain and Ireland.</i>	<i>Per-centage.</i>	<i>World.</i>	<i>Great Britain and Ireland.</i>	<i>Per-centage.</i>	<i>World.</i>	<i>Great Britain and Ireland.</i>	<i>Per-centage.</i>
Average for four years, 1927-1930.	633	292	46.1	218	146	66.9	66	26	39.4

Thus, of the world's tonnage launched during the four years 1927-1930, Great Britain and Ireland were responsible for 66.9 per cent. of vessels between 4,000 and 8,000 tons gross, 45.9 per cent. of vessels under 4,000 tons, and 38.9 per cent. of those over 8,000 tons gross.

In explanation of these proportions it may be advanced that liners form the chief part of the vessels over 8,000 tons. Most countries are anxious to build liners rather than cargo vessels. Not only is the profit greater, but national pride has to be taken into account. Countries like the U.S.A., Germany, France, Italy, no less than ourselves, try to keep the building of their bigger liners to themselves; and often this is secured by the grant of a subsidy, either direct, or in the form of a loan on easy interest and repayment terms. Mail contracts, too, often specify that the ships must be built in the country of origin. Under these circumstances one would expect that the British proportion would be lower than in either of the other two categories. Secondly, this country holds a pre-eminent position in the building of tankers, and since the tonnage of these vessels is on the average about 7,000 tons, they would help to swell the proportion of vessels of the second category built in this country. Moreover, since the general cargo boat—especially in the coal and grain carrying trades, is generally from 6,000 to 7,000 tons, and since British shipowners are the chief ocean carriers of the world, there is a further tendency for Britain's proportion of the second category to be high. Thirdly, ships under 4,000 tons are specially suitable for the timber carrying trades of the Baltic countries, and for the coasting trades of all countries; and hence we should expect a rather smaller proportion of them to be built in this country.

*Output of Ships at the North East Ports during the Period
1924-1930.*

We have already noticed that the proportion of tonnage of merchant vessels of 100 tons and over built at the North East ports since 1919 has declined relatively to the total of tonnage built at British and Irish shipyards; and secondly that the Hartle-pools, Stockton, and Middlesbrough have declined relatively to the Tyne and Sunderland. We must now examine the position at the North East ports during the last seven years. In this analysis it is proposed to take in all mercantile vessels of 15 tons net and over.

The figures for the whole Area are as follows :—

A. Number and tonnage of mercantile vessels, exclusive of those built for foreigners.

Year.	Sailing Vessels.		Steam Vessels.			Motor Vessels.			Total.	
	No.	Net Tons.	No.	Net Tons.	Gross Tons.	No.	Net Tons.	Gross Tons.	No.	Net Tons.
1924	7	1,706	167	300,235	503,530	15	40,475	67,644	189	342,416
1925	2	460	80	169,753	284,326	9	33,458	55,951	91	203,671
1926	11	2,369	32	74,523	125,536	7	19,534	33,672	50	96,426
1927	—	—	91	222,751	373,085	15	61,500	104,390	106	284,251
1928	2	437	114	252,492	419,532	23	69,212	115,125	139	322,141
1929	—	—	139	263,390	437,344	16	53,831	91,625	155	317,221
1930	6	1,496	66	121,751	204,224	14	53,239	89,767	86	176,486
Total ...	28	6,468	689	1,404,895	2,347,577	99	331,249	558,174	816	1,742,612

B. Number and tonnage of mercantile vessels built for foreigners.

Year.	Sailing Vessels.		Steam Vessels.			Motor Vessels.			Total.	
	No.	Net Tons.	No.	Net Tons.	Gross Tons.	No.	Net Tons.	Gross Tons.	No.	Net Tons.
1924	—	—	11	18,614	31,415	3	16,173	26,524	14	34,787
1925	—	—	13	15,912	26,701	3	9,126	15,356	16	25,038
1926	—	—	6	5,965	11,177	4	15,183	26,183	10	21,148
1927	—	—	16	31,834	54,537	8	19,397	34,504	24	51,231
1928	—	—	22	33,869	59,465	6	28,839	49,331	28	62,708
1929	3	300	38	67,398	115,321	9	18,468	30,597	50	86,166
1930	2	152	28	30,385	52,684	34	152,767	256,510	64	183,304
Total ...	5	452	134	203,977	351,300	67	259,953	439,005	206	464,382

C. Number and tonnage of mercantile vessels built for British and Foreign Owners.

Year.	Sailing Vessels.		Steam Vessels.			Motor Vessels.			Total.	
	No.	Net Tons.	No.	Net Tons.	Gross Tons.	No.	Net Tons.	Gross Tons.	No.	Net Tons.
1924	7	1,706	178	318,849	534,945	18	56,648	94,168	203	377,203
1925	2	460	93	185,665	311,027	12	42,584	71,307	107	228,709
1926	11	2,369	38	80,488	136,713	11	34,717	59,855	60	117,574
1927	—	—	107	254,585	427,622	23	80,897	138,894	130	335,482
1928	2	437	136	286,361	478,997	29	98,151	164,456	167	384,849
1929	3	300	177	330,788	552,665	25	72,299	122,222	205	403,387
1930	8	1,648	94	152,136	256,908	48	206,006	346,277	150	359,790
Total ...	33	6,920	823	1,608,872	2,698,877	166	591,302	997,179	1,022	2,206,994

These figures again bring out the extent to which the North East ports in 1924 recovered from the slump of 1922 and 1923; but they also show that the years 1925-28 were bad years for North East shipbuilders. The year 1929 was, if anything, a little better than 1924, but a change for the worse is definitely noticeable in the figures for 1930. When we come to notice the figures of new orders, or of tonnage commenced, we shall find the change in 1930 still more strongly marked.

The relation between steam and motor vessels is worthy of note. The proportion of motor vessels for this country is almost exactly one-seventh of the number of steam vessels; whereas of those built for foreigners the proportion is one-half. The year 1930 is also noteworthy for the marked increase in the number of motor vessels, chiefly tankers, built in the North East ports for foreigners.

(viii) Capacity of the Shipbuilding Industry on the North East Coast.

Appendix III of the Report of the Committee on Industry and Trade—Survey of Metal Industries (Shipbuilding Section, p. 404) gives the following numbers of berths of the shipyards of the United Kingdom and various Continental countries :—

	1914.	1920.	1925.
Great Britain and Ireland	580	806	686
Belgium	8	8	8
Denmark	13	31	34
France	56	73	89
Germany	140	161	167
Holland	84	115	152
Norway	22	35	37
Sweden	18	28	31
Total of 7 Continental Countries ...	341	451	518

Berths under 250 feet in length are omitted, as being suitable only for coasting vessels. It must be noted, too, that in the abbreviated form of the table, as given above, no account is taken of the different lengths of berths, nor of differences in shipyard equipment and efficiency, all of which must be taken into account when considering output capacity.

The number of shipbuilding berths on the North East Coast was at the close of 1931 approximately as follows :—

Blyth and the Tyne	83
The Wear	37
The Tees	22
The Hartlepoons	12
Total	154

The following table gives the shipbuilding firms at the close of 1931 on the North East Coast (Survey Area) with the number of their berths, the size of berths and their maximum (potential) output, as nearly as these can be ascertained:—

Blyth and the Tyne.

Place.	Name of Firm	No. of Berths.	Size of Berths.	Potential Output (Gross Tons).
1. Blyth ...	Cowpen Dry Docks & Shipbuilding Co., Ltd.	6	Up to 450 ft.	24,000
2. Walker & Wallsend	Swan, Hunter & Wigham Richardson Ltd.	20	—	150,000
3. "	Palmers' Shipbuilding & Iron Co. Ltd.	12	Up to 700 ft.	150,000
4. "	R. & W. Hawthorn Leslie & Co. Ltd.	10	" 700 ft.	100,000
5. "	Vickers-Armstrong Ltd.	9	" 1,100 ft.	—
6. "	Sir W. G. Armstrong Whitworth & Co. Ltd.	12	" 570 ft.	70,000
7. "	Wood, Skinner & Co.	7	" 450 ft.	—
8. "	John Readhead & Sons Ltd.	4	" 450 ft.	50,000
9. "	Eltringhams Ltd.	3	" 340 ft.	25,000
9 Firms.	Total Blyth and Tyne ...	83		

In December, 1931, Nos. 1, 3 (Hebburn Yard only), 5, 6, 7, 8, and 9 were temporarily closed down, though Nos. 1, 3, 5, and 8 were doing repair work.

The Wear.

Place.	Name of Firm.	No. of Berths.	Size of Berths.	Potential Output (Gross Tons).
1. Sunderland	Wm. Doxford & Sons Ltd.	6	Up to 540 ft.	100,000
2. "	Sir James Laing & Sons Ltd.	5	" 550 ft.	50,000
3. "	Wm. Gray & Co. Ltd.	4	" 500 ft.	47,000
4. "	Sir John Priestman & Co.	4	" 600 ft.	40,000*
5. "	Short Bros. Ltd.	4	" 500 ft.	38,000
6. "	Joseph L. Thompson & Sons Ltd.	4	" 470 ft.	50,000
7. "	S. P. Austin & Son Ltd.	3	" 360 ft.	12,000
8. "	Wm. Pickersgill & Sons Ltd.	3	Not stated	30,000
9. Southwick	Swan, Hunter & Wigham Richardson Ltd.	Not stated.	" "	—
10. "	Bartram & Sons Ltd.	2	Up to 430 ft.	40,000*
11. "	John Crown & Sons Ltd.	2	" 300 ft.	4,500
11 Firms.	Total	37 +		

* Indicates "dead weight" and not gross tonnage.

Of these, in December, 1931, all except No. 4 were temporarily closed down; though Nos. 2, 7, and 11 were doing a certain amount of repair work.

The Tees.

Place.	Name of Firm.	No. of Berths.	Size of Berths.	Potential Output (Gross Tons).
1. Stockton ...	Wm. Gray & Co. Ltd.	4	Up to 600 ft.	47,000
2. Haverton-on-Hill	Furness Shipbuilding Co. Ltd.	12	„ 750 ft.	Not stated.
3. Middlesbrough.	Smith's Dock Co. Ltd.	6	„ 575 ft.	„ „
3 Firms.	Total	22		

The Hartlepoons.

Place.	Name of Firm.	No. of Berths.	Size of Berths.	Potential Output (Gross Tons).
1. West Hartlepool	Wm. Gray & Co., Ltd.	9	Up to 500 ft.	105,800
2. „	Irvine's Shipbuilding & Dry Docks Co. Ltd.	Not stated.	„ 400 ft.	65,000
2 Firms.		12 (say)		

- The following firms have closed down since the War:—

The Tyne (5 firms).

J. P. Rennoldson & Sons Ltd.	South Shields	—
Chas. Rennoldson & Co. Ltd.	South Shields	Sold to National Ship-builders' Security Ltd.
Newcastle Shipbuilding Co. Ltd.	Hebburn	—
Renwick & Dalgliesh Ltd.... ..	Hebburn	Sold to National Ship-builders' Security Ltd.
Northumberland Shipbuilding Co. Ltd. ...	Howdon	do.

Amble (1 firm).

The Amble Shipbuilding Co. Ltd.	—	—
--	---	---

The Wear (4 firms).

J. Blumer & Co.	—	—
The Sunderland Shipbuilding Co. Ltd.	—	—
Osbourne, Graham & Co. Ltd.	—	Sold to National Ship-builders' Security Ltd.
Robert Thompson & Sons Ltd. (still doing repair work).		—

The Tees (4 firms).

Richardson, Duck & Co. Ltd.	Thornaby	—
Ropner Shipbuilding & Repairing Co. (Stockton) Ltd.	Stockton	—
Craig, Taylor & Co. Ltd.	Stockton	Sold to National Ship-builders' Security Ltd.
Smith's Dock Co. Ltd.	Stockton	do.

(ix) Warship Construction.

The tonnage of warships launched in the United Kingdom at other than Royal dockyards is shown in the following table (taken from Statistical Tables, British and Foreign Trade and Industry, Part II, p. 122):—

<i>Destination.</i>	<i>In thousand tons displacement.</i>							
	<i>Average. 1907-1913.</i>	<i>1924.</i>	<i>1925.</i>	<i>1926.</i>	<i>1927.</i>	<i>1928.</i>	<i>1929.</i>	<i>1930.</i>
For Admiralty ...	86	—	70	23	1	75	20	22
For British Dominions	—	—	—	—	—	21	—	4
For Foreign Nations...	25	—	—	—	—	10*	12*	1
Total ...	111	—	70	23	1	106	32	27

* Approximately.

The total displacement tonnage built in private yards in the period 1924-1930 amounts to 259,000 tons or an average for the period of 37,000 tons, which is exactly one-third of the average in the seven years immediately prior to the War.

Relation to Output of Merchant Tonnage in this Country.

To compare the output of warship tonnage with that of merchant tonnage we take one displacement ton as being equal to two gross tons. This is really an underestimate since, according to the Report of the Committee on Industry and Trade (op. cit. p. 403), a displacement ton is equivalent to rather more than two gross tons.

					<i>In thousand gross tons.</i>	
					<i>Average</i>	<i>Average</i>
					<i>1907-1913.</i>	<i>1924-1930.</i>
Merchant tonnage	...	...	...	...	1,449	1,262
Warship tonnage	...	...	...	...	222	74
					<hr/>	<hr/>
Total	...	...	...	...	1,671	1,336
					<hr/>	<hr/>
Warship tonnage as percentage of Total	...	...	...	...	13.3	5.5
Percentage ratio, warship tonnage to merchant tonnage.					15.3	5.9

The Report of the Committee on Industry and Trade, apparently judging by the proportion obtaining in 1913—an exceptional year—takes 25 per cent. as the proportion which warship construction formed of total output of British shipbuilding yards immediately prior to the War. If we take *value* of output 25 per cent. may be nearer the true proportion than the above figures indicate; and we notice that shipbuilders themselves usually accept this figure of 25 per cent. But so far as actual tonnage is concerned the figure is clearly too high. Even on the assumption that one displacement ton is equivalent to $2\frac{1}{2}$ tons gross, the proportion of warship tonnage to total output would only amount to 16.6 per cent.

Warship Construction on the North East Coast.

The Tyne is practically the only port on the North East Coast of any importance as regards the construction of warships. From 1900 to 1913 the only war vessel built at any of the other ports was a torpedo boat of 360 tons gross built on the Wear in 1901. During the War a number of small vessels were launched both at Middlesbrough and at Stockton, but so far as our information goes none of them was larger than 593 tons net and most of them were between 227 and 329 tons net. The highest tonnage for these two ports was 3,015 tons net in 1913. Apparently no war vessels have been constructed there since 1919, and apparently none at the Hartlepoons either before or since the War.

The annual average warship tonnage built on the Tyne during the seven years 1907-1913 was 32,503 displacement tons; whereas the average annual tonnage built in the seven years 1924-1930 was 8,304 gross tons.

Taking one displacement ton as being equivalent to two gross tons, this means that the average warship tonnage built on the North East Coast (i.e. the Tyne) during the seven years 1924-1930 was only about one-eighth, or $12\frac{1}{2}$ per cent., of the seven pre-war years. Thus the percentage diminution of warships built on the Tyne is much greater than that of the country as a whole, one-eighth of the pre-war output as compared with one-third for the whole country. Moreover, in the post-war period output of war vessels has been very irregular. None was launched in 1921, 1922, 1923, 1924, and 1926, and but 1,680 gross tons in 1927 and 4,320 gross tons in 1929. The loss to the shipbuilding

industry of the Tyne, due to this diminution of warship orders is therefore threefold, (1) a diminution to one-eighth of the pre-war amount, (2) a very irregular demand, (3) a diminution in value greater than one-eighth, since the value of a warship ton for ton is much greater than for merchant ships, and involves the employment of a greater amount of labour.

Relation of Warship Tonnage to Merchant Tonnage on the North East Coast.

					<i>In thousand tons gross.</i>	
					<i>Average</i>	<i>Average</i>
					<i>1907-1913.</i>	<i>1924-1930.</i>
Merchant tonnage	...	...	...	...	717	529
Warship tonnage	...	...	...	...	65	8
					782	537
					8.3	1.5
Warship tonnage as percentage of Total	...	...	...	...	8.3	1.5

We thus see that both in the pre-war and the post-war period the proportion of warship tonnage to total tonnage was lower on the North East Coast than in the country as a whole.

(x) Ship-Repairing on the North East Coast.

The repair of ships is, of course, an important and valuable section of the shipbuilding industry; and this is especially the case at the North East Coast ports, and particularly on the Tyne, which far exceeds the Wear or the Tees in the number of its dry docks and other equipment for dealing with this class of work.

The ship-repairing capacity of the Survey Area can be judged by the figures given in the following table:—

River.	Number of Firms.	Docks.		Pontoons.	
		Total Number.	Total length (feet).	Total Number.	Total length (feet).
Blyth	1	5	1,835	—	—
Tyne	13	27	10,933	2	765
Wear	5	6	2,271	—	—
Tees	3	6	3,055	—	—
West Hartlepool ...	3	5	2,061	—	—
	25	49	20,155	2	765

The largest firm on the Tyne has four docks and two pontoons, that on the Wear two docks, on the Tees four docks, and at West Hartlepool two docks. It should be mentioned that certain of the firms included in the above table are also shipbuilders, shipbuilding being, in most of these cases, their main business, whilst repairing is a subsidiary part of their work. The rest are mainly or solely ship-repairers. Since the War, two firms have permanently

closed down, one at Blyth, and one on the Tyne, and one on the Tyne has closed its yard on the south side of the river and concentrated the work at its yard on the north side.

It has been found virtually impossible to obtain any kind of statistics which would enable us to make valid comparisons of the amount of work in post-war years, compared with pre-war years, or comparisons between any of the post-war years. The Ministry of Labour figures do not give workers in ship-repair yards separately from those in shipbuilding yards proper. Nor could they very well do so, since the kind of labour employed is similar and in most cases, if not in every case, is interchangeable with that employed in shipbuilding.

It has, however, been possible to get some idea of the numbers employed in each year from 1925 onwards from the lists of firms exchanging 20 or more Unemployment Insurance books in bulk in July of each year, which have been obtained for us by the Ministry of Labour. We have taken—so far as they can be separated—only those firms who are solely, or chiefly ship-repairers, and those shipbuilding and repairing firms where the exchange of books is shown separately for the repairing part of their yard.

In all, we have thus been able to take particulars in respect of 13 firms. The numbers employed in July each year by these firms were as follows :—

	1925.	1926.	1927.	1928.	1929.	1930.	1931.
Books Exchanged	3,545	2,940	4,208	3,764	5,070	5,867	3,032
Index Numbers	100	82·9	118·6	106·2	143·0	165·5	85·5

It is, of course, necessary to bear in mind that these figures apply only to a certain date or dates in July, and cannot be taken to represent the average employment during the 12 months of each year. It is unfortunate that we have not corresponding figures for 1924. But taking 1925 as base year (=100) we find the percentage variations are as indicated by the series of index numbers. Comparing these figures with the good and bad years of shipbuilding we find there is a certain similarity. Thus 1929 and 1930 are good years, 1926 and 1931 poor years. But the similarity is limited. The variations are not so marked as in shipbuilding. Moreover 1931 does not seem to have been so bad a year for ship-repairing as for shipbuilding, and this seems to be borne out by the general evidence we have obtained. So far as we can gather there is no close correlation between the amount of new work and the amount of repair work in any given year. It is possible that owners will delay repairs until freights seem to be about to improve. But others will seize the opportunity of a time of low freights to get repairs done. And, of course, some repairs will not wait. They must be done at once.

The above figures, as we have indicated, cannot be regarded as conclusive. And it is difficult to see what other statistics could be obtained that would be more satisfactory. Tonnage dealt with is obviously unsuitable, since the repairs on a small ship may often be more considerable than repairs on a big ship. The number of days in dry dock might perhaps be a better index, but even this would fail to give an index of the amount of work done on a ship. The annual value of the work done would be a better guide, provided the figures could be corrected for changes in the value of the materials and labour. We have tried to measure the changes on this basis, but have had to abandon the attempt. The corrections to be applied are too complicated and uncertain. We are thus left to measure the changes by purely general impressions which correspond in the main with the conclusions drawn from the employment figures.

It is not possible from the employment figures given above to frame an estimate of the relative importance of ship-repairing and shipbuilding as regards their respective demands for labour. The numbers employed in repair work must be higher than those given above since only certain firms were taken into consideration. But they go to show that the proportion employed in repair work is probably at least from one-eighth to a fifth of those employed in the industry as a whole.

Holland has, for many years, been the chief competitor of the North East Coast in repair work, and she still remains an active competitor. Latterly, however, Swedish firms have become more active, and recently their competition for foreign work has been very keen.

The result of our going off the gold standard has been to help British repairers in their competition with the yards in countries still on the gold standard. A certain increase of work is already observable, but it does not affect the competition of those countries, like Sweden, which have also abandoned the gold standard.

(xi) The Change in the Shipbuilding Industry since March, 1930.

Measured by the amount of tonnage launched, the years 1929 and 1930 were relatively good years for the shipbuilding industry of this country. Our proportion of world output of merchant tonnage was, in 1929, 1,522,623 tons, or 54.5 per cent.; and in 1930, 1,478,563 tons, or 51.2 per cent.

But statistics of tonnage launched during a given year are apt to conceal, for some time at least, changes that may be taking place in the actual position of the industry; and this is certainly true of the latter part of 1929 and the whole of 1930.

In order to make clear what this change was, let us take, instead of launching figures, the tonnage commenced, and the tonnage under construction in each quarter of the year. The figures are given in detail in Tables 11 and 12 of the Appendix.

Taking first the tonnage of vessels under construction we find that in the March quarter of 1930 it reached the high figure of 1,612,993 tons, which is a peak figure for the post-war period, though it formed only 49.8 per cent. of the world tonnage under construction in that quarter. It may be noted, in passing, that this high figure was largely due to a considerable volume of tanker tonnage being built, chiefly on the Tyne, for Norway.

This amount of tonnage in hand, and the amount of tonnage commenced in that quarter were in, what may be called, normal balance with the amount of tonnage launched.

But since March, 1930, the position has steadily grown worse, as is clearly shown in the following table:—

Tonnage of Merchant Vessels under Construction.

Quarter ended	North East Coast.		The Clyde.		Great Britain and Ireland.			The World.
	Tons.	Per-centage of Great Britain and Ireland.	Tons.	Per-centage of Great Britain and Ireland.	No. of Vessels.	Tons.	Per-centage of World.	Tons.
1930.								
March..	583,043	36.15	572,258	35.5	354	1,612,993	49.8	3,238,979
June ...	507,063	36.5	464,334	33.4	302	1,387,963	47.24	2,938,129
Sept....	380,323	34.1	406,088	36.45	246	1,113,846	43.5	2,558,968
Dec.....	266,986	29.5	376,297	41.6	170	904,292	39.0	2,316,743
1931.								
March..	200,327	29.0	294,522	42.7	122	690,394	34.76	1,986,162
June ...	163,485	29.6	217,020	39.2	94	553,089	30.4	1,819,892
Sept....	105,693	25.4	198,000	47.5	86	416,885	27.3	1,529,111

During the period from March, 1930, to September, 1931, world tonnage under construction declined from 3,238,979 tons to 1,529,111 tons, a decrease of about 50 per cent. But the tonnage under construction in Great Britain and Ireland declined from 1,612,993 tons to 416,885 tons, a decrease of nearly 75 per cent. The slump in this country is therefore relatively much greater than in the rest of the world.

Comparing the North East Coast with the Clyde we find that the former has fared definitely worse, its tonnage falling roughly to less than one-fifth of its former amount, whilst the Clyde tonnage has fallen to about one-third of its former amount. Moreover, the total tonnage on the North East Coast since the June quarter of 1930 is actually less than that of the Clyde, though one must not forget that the new Cunarder under construction on the Clyde makes an appreciable addition to the Clyde figures.

Let us now turn to the figures of tonnage commenced, as set out in the following table :—

Tonnage of Merchant Vessels commenced.

Quarter ended.	North East Coast.		The Clyde.		Great Britain and Ireland.			The World.
	Tons.	Per-centage of Great Britain and Ireland.	Tons.	Per-centage of Great Britain and Ireland.	No.	Tons.	Per-centage of World.	Tons.
1929.								
March ...	191,111	52.9	146,030	40.4	125	361,022	54.9	657,523
June ...	180,726	42.4	123,945	29.1	151	426,215	61.7	690,575
Sept. ...	177,790	49.4	117,363	32.6	103	360,087	53.9	667,860
Dec. ...	244,601	49.4	127,470	25.75	135	495,090	51.5	961,788
1930.								
March ...	176,941	41.6	132,898	31.3	122	425,093	50.9	834,788
June ...	99,967	42.14	63,149	26.6	88	237,206	41.6	570,625
Sept. ...	48,420	30.6	63,971	40.4	68	158,336	33.5	472,885
Dec. ...	39,014	30.3	83,508	64.8	33	128,875	29.54	436,244
1931.								
March ...	5,790	18.05	6,100	19.0	20	32,085	13.6	235,567
June ...	5,480	24.8	7,288	33.97	22	22,105	9.6	230,959
Sept. ...	21,435	55.8	15,850	41.3	24	38,415	22.3	172,022

It will be seen that throughout 1929 the tonnage commenced in this country was 50 per cent. or more of world tonnage commenced; and in the June quarter rose to 61.7 per cent. But by the end of June, 1930, a change was definitely marked. Tonnage commenced in the June quarter of 1931 was less than one-tenth of that commenced in June, 1930, and only about one-twentieth of that in June, 1929; whereas in the same periods world tonnage fell only to about two-fifths and one-third, respectively.

In the matter of tonnage commenced the North East Coast compares more favourably with the Clyde, than the statistics for tonnage under construction seem to indicate.

It is clear, therefore, that 1930 was a "completion" year; and that the statistics of tonnage launched and tonnage under construction were masking changes taking place in the industry.

Thus, the position at the beginning of 1931 was a serious one for British shipbuilding; and it grew steadily worse until the September quarter, when a slight recovery was noticeable. As one authority has said, "the merchant tonnage ordered in 1930, including the new Cunarder, was only about half of the tonnage ordered in 1929; the tonnage commenced was only about half of the tonnage launched; and the tonnage under construction had fallen by September, 1931, to one-quarter of what it had been in March, 1930. And to this must be added the diminution in warship tonnage.

By April, 1931, only about 17 per cent. of the berths in commission in British shipbuilding yards were occupied, and work had been suspended on 3 per cent. of those berths. The orders for new tonnage in the four quarters ending March, 1931, amounted only to some 129 vessels of 326,000 tons, which is about one-quarter of the tonnage ordered in the corresponding quarters of the previous year, and in each of the years 1927, 1928, and 1929. Since March, 1930, about 80 per cent. of the firms who are members of the Shipbuilding Employers' Federation have received no orders for new ships, and during the six months from September, 1930, to March, 1931, the percentage rose to 90 per cent. No fewer than 25 yards were in March entirely closed for lack of work."

The Special Case of Oil Tankers.

We have already noticed the fact that the North East Coast has established a reputation for the building of oil tankers. The question therefore arises whether the change in the position since March, 1930, is due to any fall in the demand for these vessels.

Complete statistics for tanker tonnage, both "commenced" and "under construction" for each quarter of 1929, 1930 and 1931 are given in Tables 13 and 14 of the Appendix. From these we find that the position on the North East Coast has been as follows:—

Tanker tonnage commenced.

	Tankers.	Total Merchant Tonnage.	Tankers percentage of Total Tonnage.
1929 March Quarter ...	15,990	191,111	8.4
June " ...	24,150	180,726	13.4
September " ...	76,086	177,790	42.8
December " ...	137,134	242,721	56.5
1930 March " ...	116,968	176,941	66.16
June " ...	68,814	99,967	68.8
September " ...	41,100	48,420	84.9
December " ...	28,681	39,014	73.5
1931 March " ...	3,850	5,790	66.5
June " ...	4,990	5,480	91.06
September " ...	—	21,435	0.0

We see that more than half of the total merchant tonnage commenced on the North East Coast since the middle of 1929 has been tanker tonnage. During 1930 and the first half of 1931 well over two-thirds of the total merchant tonnage commenced was tanker work. In fact, without tankers these years would have been bad indeed for the North East Area. Since March, 1930, tanker orders have declined, as orders for other merchant tonnage have declined. But it is not a decline of tanker orders alone which has brought about the present position in the Area.

(xii) The Financial Position of the Industry.

It has not been possible to secure information of a kind which would enable us to compare the financial position of the industry in the North East Area with the financial position of the industry in the country generally. Nevertheless we think it worth while to set out in Appendix, Table 15 certain financial details for the years 1929 and 1930 concerning a group of seven shipbuilding, ship-repairing, and marine engineering companies which operate on the North East Coast. Somewhat similar information relating to a larger group of British shipbuilding companies is published each year by the shipping paper "Fairplay."

(xiii) Foreign Competition in the Industry.

It is in connection with orders from abroad, that other countries are of real importance as competitors with builders in this country. British owners only rarely place orders for new ships abroad.

It cannot be said that any one country is our chief competitor. At one time it may be France or Germany, at another Holland or Italy or Sweden. It partly depends on the class of work—as for example liners in the case of Italy, or tankers in the case of Sweden. Italy has only become a serious competitor during the last eight years, largely for political reasons.

Foreign yards were not efficiently organised until 10 or 12 years ago. In Italy and Spain, for instance, machinery has only been installed on a large scale within the last few years, and hence their competition has only recently become effective. Until six or seven years ago it is probably safe to say that Great Britain was the only country commercially able to build oil tankers; but in the last four years other nations have become effective competitors with us in this class of vessel. Denmark during the War experimented with the application of the Diesel engine in the propulsion of ships, and thus gained a four years' start of us in the construction of motor ships which we are only now overtaking.

The equipment in the best continental yards is probably as good as our own, though the average may be worse. There is, we find, a general impression among shipbuilders in this country, based on visits abroad, that foreign yards are, if anything, over equipped—in roofs, floors, tools and machinery, the upkeep costs of which will tend to be excessive.

Their method of working also differs considerably from our own. An extensive use of what is called "Fabrication" or "Expansion" work allows much work to be done by semi-skilled or unskilled labour which in this country would be done by skilled craftsmen. By this method much of the work formerly done at the ship's side is now done from drawings prepared in the loft. Fabrication work in this country is increasing to a certain extent but the method in some cases involves slightly more expense, and

extra speed and increased output are therefore required to compensate for this; and, so far, agreements with the trade unions concerned have not always allowed these compensations to be obtained. Compared with other countries, therefore, the amount of fabrication work done in this country is small.

It is probably true, too, that the administrative staff in British yards is smaller, and better organised, than in most continental yards; and that in the practical applications of science, in the facility of preparing new and better designs, in the more rapid construction of ships, and in the craftsmanship of the workers, this country is still ahead even of the best of her competitors.

On the other hand, foreign builders are frequently assisted by their governments, either by way of subsidy or by grants of loans on easy terms as to interest and repayment. This makes the competition of foreign builders in the open market all the harder for British builders to meet. Similarly the assistance given to Belfast by the Government of Northern Ireland has been a handicap to other shipbuilding centres in this country in the competition for orders. On these matters, however, we have not sought for detailed information since the matter was dealt with by the Committee on Industry and Trade and in any case we felt that the facts are fully known to H.M. Government.

We cannot but feel that foreign competition in the future will be more severe than in the past. Whether this will reduce the proportion of world tonnage built in this country, as compared with previous years, will depend very largely on the extent to which the industry is able to reduce its cost by the closing down of redundant yards, by a greater degree of standardization or specialisation of output, and by a greater degree of co-operation between all those engaged in the industry.

The industry in this country has, as we have seen, certain things in its favour; and to these may be added, first, the aptitude of the British workman for doing his job with the smallest number of tools and the least equipment; and, secondly, our climate. In neither winter nor summer is work delayed by adverse conditions; whilst most of our competitors suffer considerably in this way. In some, as in Italy, there are frequent stoppages in summer owing to the great heat; whilst in others, as in Sweden and Denmark, there are frequent stoppages in winter.

The question is whether we can maintain our proportion of the world output of tonnage at the level of 50 per cent.

(xiv) Research in the Shipbuilding Industry.

Chatterton, in his book "Sailing Ships", states that in the period from 1841 to 1847, no less than 40 shipbuilders on the Wear alone went bankrupt; and Mr. G. S. Baker has asserted that this country recovered by openly copying the designs of other countries, and improving upon them. Moreover, we must bear in mind that in the history of shipbuilding this country only attained

its predominant position when iron and steel came to be used for shipbuilding. In 1850, for example, the United States of America were producing about as much tonnage as we were.

The general decline of trade and the keener competition of foreign countries in the building of ships is likely at least to lead to a re-examination of our methods. The question is whether this country possesses the facilities for research work possessed by other countries and whether our shipbuilders attach as much importance to research as do their competitors. On these two points we do not feel justified in expressing any personal views. We can but state the views expressed by those connected with the industry whom we have consulted. It would certainly seem that foreign nations are ahead of us in this matter. Forty or fifty years ago, progress was due chiefly to foreign builders. The only centre for research in this country was that of the Admiralty at Greenwich, and up to twenty years ago practically all Lloyd's Surveyors were Greenwich trained men. It is true that considerable progress has been made in this country largely through the establishment of chairs in Naval Architecture at Glasgow, Newcastle, and Liverpool. Lloyd's Register have adopted for some years the policy of special research in shipbuilding—mainly from their particular point of view. There is also the National experimental tank at Teddington to which a second is to be added; and a few firms have tanks of their own.

The shipbuilding industry, though one of the most important industries of the country, has, as yet, no definite centre of research. It is, of course, possible to argue, as most British shipbuilders do, that laboratory experiments are apt to cost more than they are in practice worth; and that whilst we spend less in research than, say, Germany and certain other continental countries, we are not behind other nations in the actual results achieved. This may be true, but considering how much the progress of other industries in recent years has been the direct result of the application of scientific discoveries in research laboratories, either at the works or in the Universities, we cannot help but feel that the provision for research in shipbuilding problems in this country is inadequate to our needs; and that the attitude of the industry towards research is not as favourable as it should be.

That there is scope for such research is admitted. One prominent builder has asserted that the designs for merchant vessels in 1920, both in technical features and in lay-out, were those of 1913 and 1914; that since 1920 there has been rapid progress, especially in the form of the ship, combined with the dimensions and revolutions of the propeller; that the standard of efficiency is now considerably higher; and that in these matters this country has led the way. Whether without attention to research it will continue to lead the way in the developments of the next ten years, is a point on which we are somewhat doubtful.

(xv) Changes in the Industry Designed to meet the Post-War Situation.

In the majority of the shipyards of Great Britain since the War, but particularly during the last eight years, there seems to have been a marked improvement both in methods and equipment. They are certainly much better equipped than they were in 1913. The increase in the number of building berths was, as events have since shown, an unfortunate development, but the plant and organization are on a much higher level of excellence. This is true both of the North East Coast and of the Clyde, and probably also of Barrow and Belfast.

Particular instances are the extended use of the pneumatic riveter, and the introduction and extended use, especially during the last five years, of a plate-punching machine, which requires one man only to perform an operation which formerly required seven or eight men. This machine is being fairly generally adopted in the larger yards, but has not, as yet, been adopted in the smaller yards to the same extent as the pneumatic riveter. There has been, too, an increase in craneage and lifting capacity, both in quality and quantity. There has been a distinct tendency in recent years to do more of the work by machines and less by manual labour.

There has, too, been a considerable advance in the matter of cost accounting. Shipbuilders are now able to watch items of cost that they were unable to do previously except in a very general way. The use of materials, the application of labour and of power, the use of machines and of cranes, the amount of wastage of material, are all now subject to detailed accounting. What was formerly the subject of haphazard guesswork can now be checked by accounting statistics. In many works a running check on costs in relation to each ship is kept—called the "barometer"—and though there is about a fortnight's lag between the two, a firm can now tell how its costs are running and how each Department's costs are running. In this respect the North East is probably as well organized as any other district, its principal accountants and advisers having very expert knowledge on this subject in relation to the industry. This development is, of course, of the greatest assistance to a firm when tendering for new tonnage, especially in view of the keener competition of the present time. Improvements in costing systems are just as important as improvements in methods and organization in the yards themselves.

Apart from the formation of the National Shipbuilders' Security Ltd., there appears to have been but little change in the structure and organization of the industry as a whole, at least in the North East Area. A certain amount of amalgamation took place during the post-war boom. But the movement resulted in over-capitalisation in the case of the firms concerned and the movement quickly died out. Since that time there has been little or no attempt at amalgamation of firms. The reorganization of Messrs. Vickers Armstrongs is probably the only recent case in the Area.

There is, too, comparatively little co-operation between individual firms. Practically the only instances are where two sister ships are being built by two builders for a single owner. In such a case there may be an exchange of information as to costs; but there is no systematic organization for exchange of this kind of information. So long as firms retain their individuality it is but natural that they will retain a bit of their jealousy.

So far, too, there has been little tendency to co-operate in a common selling policy. The competition between individual firms is very keen, and has in many cases become a cut-throat competition. It is possible that already in this matter a change is impending, and that in the future the shipbuilders of the country may co-operate in some scheme to prevent undue competition among themselves.

(xv) Specialization.

A recent writer (E. Sundstrom), on the position of the ship-building industry in the Scandinavian countries, ascribes their relatively flourishing condition to the fact that Scandinavian shipbuilders have specialised to a greater extent than builders in other countries. The present tendency, he says, is towards the production of standard motor ships especially in regard to oil tankers, with the result that motor vessels can now be built as cheaply in Scandinavia as in any other country, and he states that Sweden is now receiving orders for this class of ship from German owners, since the Swedish price is substantially lower than German prices for the same type of vessel.

The question therefore arises to what extent would this country benefit by a greater degree of specialization and to what extent could it be carried out.

It is probably true to say that there has been but little movement in this direction in this country. There are of course firms, as at the Hartlepoons, which build only cargo vessels and do not compete for liners or tankers; but on the other hand there are firms whose lay-out and organization enable them to take orders for anything from the smallest cargo boat to a floating dock or the largest Atlantic liner. It is true that even such firms do specialise to a certain extent. One firm on the Tyne has laid itself out particularly for three types of output, floating docks, passenger liners, and oil tankers, and is a keen competitor for all three classes of work. The question remains whether a lay-out for such widely different classes of work is an economic one; whether in fact, the building of a "Mauretania" or a "Monarch of Bermuda," once in ten or twenty years or so does not in the long run mean a loss. A big job of this kind means a special berth, special equipment, and special staff. The question whether an industry so organized is as economic as it might be if it consisted of a number of yards, each specialising in a certain type of work seems to

us worth closer consideration. There has been some specialisation as, for example, in dredgers, in ferries, in torpedo boat destroyers, and the like. But the industry generally is not specialised. Why not? The question is not an easy one to answer. The industry is not under a general control and therefore one has to consider the individuality of the builders. In the past they have prided themselves on being able to tackle anything that has been offered to them. Secondly, owing to excess capacity most firms have been only too glad to get anything they could. Firms have not been able to fill their yards with the class of work they are best equipped for, hence rather than have berths vacant they are willing to take classes of work they would otherwise leave alone. They are thus able to reduce overhead costs, and sometimes undercut a rival firm better equipped for a particular type of ship. A big firm will thus undertake a small boat because it can fit it in with all its other ships.

Nevertheless, the point is being studied by those in the industry. At the moment they feel that the other problem—the reduction of surplus capacity—is of far greater importance to the industry. If and when this is achieved it is possible that the movement towards a greater degree of specialization may be accelerated. It is agreed that a greater degree of specialization would reduce costs—but *within limits*. It is extremely unlikely that the big firms will specialise to a much greater extent than they do at present. They feel they must be able to “cut in” for other classes of work, when their departments are a little out of joint, or when the demand for their special types of work is slack.

(xvi) Probable future demand.

The Placing of Orders for New Tonnage.

It has long been recognised that the fluctuations of industry and trade, known as the trade cycle, have probably a more marked effect on the shipbuilding industry than on any other of our staple industries. This is due in the main to the fact that fluctuations in the volume and value of world trade are quickly followed by fluctuations in shipping freights, and the employment of shipping tonnage afloat. Demand for new ships follows very closely changes in shipping freights. Shipowners hesitate to place orders for new ships whilst freights are falling and vessels are being laid up. New orders come along when freights begin to rise. But since ships take an appreciable time to build there is a definite time lag between the time when the peak of freights is reached and that of the peak of the output of new tonnage. This was well exemplified in 1930, when owing to the fall in freights many new ships left the shipbuilding yards to proceed direct to laying-up berths. In fact, some in 1931 have not yet left the builders' yards. The new tonnage is often, therefore, being put on the market at the wrong time, and merely serves either to accentuate the fall in freights or

to prolong the period of their recovery. The problem is, if possible, to bring about such a change that the peak of output of new tonnage shall precede, and not follow, the peak of shipping freights in the general movement of the trade cycle. If this could be done it is probable that the fluctuations both of shipbuilding construction, and of shipping freights would be reduced. The trade cycle fluctuations would remain; but peaks and depressions would be reduced in amplitude.

The problem would, of course, be solved—so far as it is solvable—if shipowners would place their orders at an earlier stage than they do at present. To do this would involve, however, a closer study of the trade cycle than shipowners—or other business men—have given it in the past, and especially a more serious attempt at the forecasting of business. It is obvious that the shipowner would gain appreciably if this could be done with anything approaching a moderate degree of success. The shipbuilding industry, too, would gain by keeping both plant and labour more regularly employed.

Shipbuilding Costs.

The market price of a new, ready, single deck steamer of about 7,500 tons deadweight, of a bare specification, is given by "Fair-play" as follows in the years named:—

		£			£
June, 1914	...	42,500	June, 1924	...	60,000
" 1919	...	195,000	" 1927	...	63,000
" 1920	...	180,000	" 1930	...	48,750
" 1921	...	63,750			

It is, however, doubtful whether such figures have any real practical value; and they can at best be used only with caution.

It is not an easy matter to make a satisfactory comparison between the detailed costs of vessels built, say, in 1914, 1924, and 1931. Methods of costing have in many cases been altered. The scantlings of vessels have been modified, and the disposition of the structural members re-arranged so as to obtain greater strength with less weight, thus reducing the cost of steel and iron for structural work. Methods of construction have been simplified. Facilities in the yards have been improved, resulting in cheaper costs of production and greater speed in building. Owners' requirements are, on the whole, more costly than in pre-war times. Alterations in the Board of Trade requirements have added greatly to the cost, as compared with 1914, especially in the case of passenger vessels. The price of steel plates and sections varied in 1914 from £6 to £7 5s. per ton. To-day the basic price is £8 15s. per ton, less a rebate of 15s. a ton for builders who undertake not to buy any foreign steel. Time-wages, as compared with those in 1914, show an increase of from 17 to 62 per cent. in 1924, and from 45 to 70 per cent. in 1931. The higher percentages refer to the wages of general labourers. In the case of iron workers on piece-work the average increase over 1914 was in 1924 about 25 per cent., and as from

January, 1932, it will be about 15 per cent. As a result of improvements and increased facilities in shipyard equipment actual iron-work costs do not reflect these increases to the full extent. In fact, actual iron trades' costs are but little in excess of the costs in 1914 in certain classes of ships. In passenger ships the cost of timber for decks and cabin work is a very much larger proportion of the total cost than it is in the case of cargo steamers. In both 1924 and 1931 the increased cost of these materials ranged from 28 to 111 per cent. above the prices ruling in 1914. If to this we add the increase of 46 per cent. in the wages of joiners and other wood workers, we see that the cost of passenger ships has appreciably increased since the pre-war period. It will be realised, therefore, that any detailed comparison of costs must of necessity be approximate.

An examination of the costs of vessels of different types shows that:—

Steel material varies from 30 to 40 per cent. of the total cost of the hull.

Other material varies from 25 to 35 per cent. of the total cost in the case of cargo vessels.

Steel labour is about 20 per cent. of the total cost of the hull.

Other labour varies from 12 to 16 per cent. of the total cost of the hull.

Classification is about 0·8 per cent.

Workmen's Compensation and Insurance is about 1·5 per cent.

By the kindness of a builder we have been able to make an analysis of the costs of a typical cargo boat to carry 9,100 tons, recently built on the North East Coast. Of the total prime cost of the hull the cost of steel represented 39·2 per cent., whilst shipyard labour represented 32·7 per cent. The cost of the machinery amounted to about 45 per cent. of the total cost of the hull.

A study of the detailed costs in the case of this ship brings out the point that the shipbuilding industry is to a large extent an "assembling" industry. The shipbuilder assembles in his yard the finished products of many other industries—the steel-rolling mills, the foundry, the forge, the coppersmith, the engineering industry, the boat builders, the instrument makers, and so on. The building of a new ship, therefore, gives employment in a number of other industries which are, to this extent, dependent on the prosperity of the shipbuilding industry.

The Capacity of British Shipbuilding Yards in Relation to Probable Future Demand for Ships.

The position of the shipbuilding industry in this country since the boom of 1919-21 differs greatly from its pre-war position. There is, first, the great increase in the productive capacity of the shipyards, an increase created during, and immediately after, the War; secondly, there is the great decrease of warship work, which leaves a large number of additional berths available for the construction of merchant shipping; thirdly, the average size of vessels has increased, and consequently fewer berths are required for the same

quantity of tonnage; fourthly, there is a reduction in the demand for merchant tonnage; and, fifthly, there is the fact that shipbuilding facilities abroad have also greatly increased, due in part to a desire on the part of these countries to develop their shipbuilding industry for national reasons, a development aided in many cases by the grant of State assistance in one form or another.

It is admittedly difficult to estimate the future demand for merchant shipping. The demand depends on so many factors, the total sea-borne trade of the world, the speed of ships, the efficiency of shipping services, etc. On the other hand there is the question whether the world's merchant fleet of 70 million tons gross is not in excess of demand, since if it is, the demand for ships in the immediate future will be less than it has been in the past. Secondly, we have to bear in mind that the proportion of world tonnage owned by British shipowners has fallen from about 39 per cent. in 1914 to about 29 per cent. in 1930. Though there has been an increase in the total of British-owned tonnage, the increase is proportionately less than the increase of world tonnage. British shipowners have failed to keep pace with the rest of the world.

Is the building capacity of the shipbuilding yards in this country in excess of future requirements; and, if so, to what extent? In 1920, the total tonnage of merchant vessels of 100 tons and over launched in Great Britain and Ireland reached the high figure of 2,055,624 tons. But we get a better idea of capacity if we take statistics of tonnage under construction. At the close of the September quarter, 1920, no less than 961 vessels of 3,731,098 gross tons were under construction in this country; whereas in 1929 and 1930, two moderately good years, the tonnage under construction averaged less than 1,500,000 tons, and only about half of the available berths were occupied. The position during 1931, as we have seen, has become worse to a marked degree. The statistics go to show that from 1922 to the end of 1930 at no time have more than 55 per cent. of the available berths been occupied.

In an article in the Glasgow Herald of December 30, 1930, Mr. A. L. Ayre, the President of the Shipbuilding Employers' Federation, analysed the position of British shipbuilding as follows:—

Let 100 be taken to represent the demand on the British shipbuilding industry prior to the War. The value of warship output prior to the War was about 25 per cent. of the whole. Hence:—

Pre-war total, merchant and warships	...	...	...	...	100·00
Less 25 per cent. for pre-war warships	...	...	...	...	25·00
Pre-war merchant ships	...	...	...	...	75·00
Less 21 per cent. reduction of merchant ships in period 1923-29 as compared with 1907-1913	...	...	...	...	15·75
					59·25
Add back post-war warships estimated at 1/7th of pre-war amount					3·57
					62·82

Hence the British shipbuilding industry has, in round figures, suffered a reduction of 40 per cent. in demand.

On the side of supply, however, a considerable expansion of capacity has taken place, due to war and post-war conditions. He takes the increase to be 20 per cent., though he considers the actual increase to have been considerably in excess of this. Then, even on this conservative estimate, the present productive capacity must be represented by 120, or practically double the amount of post-war demand.

In the above estimate, however, we feel that Mr. Ayre has over-estimated the amount of warship tonnage prior to the War and under-estimated the amount since the War. Using the figures we arrived at in the section dealing with warship construction we obtain the following revised estimate of demand :—

Pre-war total, merchant and warships	...	...	...	...	100.00
Less 16.6 per cent. for pre-war warships (at 1 displacement ton= $2\frac{1}{2}$ gross tons)	...	...	...	...	16.60
Pre-war merchant ships...	...	...	...	...	83.40
Less 21 per cent. reduction of merchant ships	...	...	...	...	17.50
					<hr/> 65.90
Add back post-war warships at 1/3rd pre-war amount	...				5.50
					<hr/> 71.40

Thus we get a reduction of demand in round figures of 30 per cent.

On the side of supply we feel that Mr. Ayre has under-estimated the increase of capacity. Productive capacity has been increased not merely by an increase in the number and size of berths—the number of berths increased in the period 1914 to 1925 from 580 to 686, which is 18.3 per cent.—but by improved organisation, the extended use of mechanical appliances, the change in methods, and the greater speed with which a vessel can now be built. It is difficult to estimate what this expansion of capacity as measured in possible output amounts to. If we take the figure of 3,731,098 tons under construction in September, 1920, as an indication of maximum capacity, and 2,600,000 tons as the maximum pre-war capacity we get an increase of about 43.5 per cent. Even if we take the maximum shipbuilding capacity of the United Kingdom in the post-war period as $3\frac{1}{2}$ million gross tons under construction and the pre-war maximum at $2\frac{1}{2}$ million gross tons under construction we still get an increase of 40 per cent. The present productive capacity would be represented by 140; which is practically double the amount of post-war demand. On these assumptions, our final estimate is the same as Mr. Ayre's though based on different figures. The main point to determine is, however, the future demand for tonnage. In the above calculation Mr. Ayre estimates it at 63 per cent. of the pre-war amount, whilst our estimate based on his method is 71 per cent., warship tonnage being included in both cases. We feel that the amount of future warship tonnage is so

difficult to forecast that it is best to leave it out of account and try to estimate the amount of merchant tonnage alone. The question is whether this can be done with anything approaching accuracy.

It will be seen from the memorandum which Professor Sir Westcott Abell has kindly furnished that he does not feel justified in deducing, from his estimate of the world's demand for shipping during the next five or ten years, an estimate of the demand for new ships. He declines to do so because of the special conditions of the present time, such as the restrictions in the way of international trade; the large amount of shipping lying idle at the present time, amounting to over 2 million tons *net* in British ports and over 10 million tons *gross* in world ports; the continuation in existence of many ships long overdue for replacement; and the unsettled position of the world's currencies. Where such an authority feels that no reliable estimate is possible, it is perhaps unwise for us to attempt it, desirable as it is for the purpose of the present enquiry. We find, however, that Mr. Ayre in another article has attempted such an estimate on different lines, and we venture therefore to examine the one he has made.

In spite of the fact that the world tonnage of 70 million tons gross appears at the moment to be in excess of world needs, as shown by the 10 million tons laid up in port, Mr. Ayre regards 70 million tons as representing the world's *average* demand for shipping at "the present time". By "the present time" he means a period of years of which 1931 is the central year. Apart from any growth of world sea-borne trade in the near future, the obsolescence and replacement of this existing tonnage will afford an appreciable amount of shipbuilding work. If the average life of the vessels now afloat be taken at 25 years, then replacement alone will require 2,800,000 tons of new construction per annum. If this country can retain her proportion of 50 per cent. of this, her share will amount to 1,400,000 tons a year. The average annual tonnage launched in Great Britain and Ireland in the period 1907-1913 was 1,449,472 tons, or 59.5 per cent. of the world total. During this period the world's total output of ships amounted to about 17,000,000 tons, whilst during the period 1923-1929 it amounted only to about 15,500,000 tons, a reduction of 9 per cent. Mr. Ayre is inclined to think therefore—though we feel he overlooks the effect of the excessive output in 1919-1921—that there has not been overbuilding of ships in the post-war period, at least not from 1923 to 1929, and that the slump in freights is due not to overbuilding of ships, but to the conditions of world trade. He would therefore add something to his estimate of 1,400,000 tons to allow for the average natural increase of world shipping, and thus arrives at a final estimate of about 1,500,000 tons as the average annual demand on British yards for merchant tonnage.

To what extent is this argument sound? By 1919 the losses of ships during the War had been replaced. The available world

shipping in 1914 was 30,836 vessels of a total of 49,089,552 tons; in 1919 it had altered to 29,255 vessels of a total of 50,919,273 tons. In 1900 there were afloat 27,840 vessels of a total tonnage of 28,957,358 tons, whilst in 1930 there were 32,713 vessels of a total tonnage of 69,607,644 tons, an increase in the number of vessels of 17.5 per cent. and an increase in tonnage of 140.4 per cent. (Incidentally, this shows the great increase in the average size of ships.)

The average merchant tonnage launched in the world during the post-war period as compared with that of the seven pre-war years is given in the following table:—

			<i>Total Tonnage Launched.</i>	<i>Average yearly Tonnage.</i>
1907-1913	...	...	17,056,075	2,436,582
1921-1927	...	...	16,868,919	2,409,845
1922-1928	...	...	15,211,315	2,173,045
1923-1929	...	...	15,537,441	2,219,635
1924-1930	...	...	16,783,732	2,397,676

Thus, as a first approximation, we might assume that in the seven-year period, 1931-1938, about 16,000,000 tons will be launched, or an average of 2,300,000 tons per annum. But allowance must be made for fluctuations. In practice it is found that the tonnage launched in a period of slump is only a little more than one-half the amount in a period of boom—the proportion is rather less in this country. We should therefore expect a fall to 1.5 million tons in the slump, and a rise to 3.0 million tons in the boom.

But Mr. Ayre's estimated average is 2,800,000 tons, or 500,000 tons more than the above analysis seems to indicate. How is this difference to be accounted for?

We are inclined to think that Mr. Ayre puts his figure of replacement, based on the average life of ships now afloat, too high. The total world tonnage of shipping afloat in 1930 was 69,607,644 tons, whereas in 1923 it was 65,166,238, an increase therefore of 4,441,406 tons. But the total world tonnage launched in the period 1924-30 was 16,783,732 tons. Hence replacements accounted for the difference between these two figures, that is 12,342,326 tons, or an average of 1,763,189 tons per annum. On the 1923 figures of total tonnage this amounts to approximately 2.7 per cent. per annum, whereas an average life of vessels afloat of 25 years would give a replacement percentage of 4 per cent. per annum. There is therefore 1.3 per cent. per annum difference between Mr. Ayre's estimate and the percentage experienced between 1923 and 1930. Suppose the percentage of 2.7 continues to obtain for the next seven years, then on a total of 70,000,000 tons in 1930 this would give us an annual increase of 1,890,000 tons, or nearly 1,000,000 tons less than on Mr. Ayre's estimate. The difference is so considerable as to be worth a more detailed investigation than

is possible in this report. We cannot but feel, however, that Mr. Ayre has overlooked the fact that during the period 1918-1921 the total world output of ships reached the high figure of 22,810,502 tons, or very nearly one-third of the total tonnage in existence in 1930. Though the bulk of this tonnage is now 12 years old, and though much of it is not nearly so efficient as more recently built tonnage, we feel, nevertheless, that 25 years is too short a period to take as the average life of vessels now afloat. In another 10 years or so this figure of 4 per cent. may be a true one to take, but hardly so at the present time.

The position would therefore seem to be as follows:—

	Tons.
Average annual world output during 1931-1938	2,300,000
Replacements calculated on basis of 2·7 per cent. of tonnage afloat in 1930	1,890,000
	<hr/>
Increase due to anticipated demand for tonnage	410,000

The question therefore arises whether this annual increase of tonnage due to anticipated demand is likely to continue. We find it impossible to attempt an answer to this question. It depends on factors, such as the growth of economic nationalism with a consequent shrinkage of world trade, the stabilisation of the world's currencies, etc., which we are unable to forecast. But it is clear that the position both of shipping and of shipbuilding depends on changes in these factors in the near future.

Leaving this question therefore unanswered, it is perhaps worth while to examine the question whether the position as to the demand for ships in this country tallies with the world position as outlined above. Let us adopt the same line of argument and take out the corresponding figures.

The actual merchant tonnage launched in this country for owners in Great Britain and Ireland only is as follows:—

	<i>Total Tonnage Launched.</i>	<i>Average Yearly Tonnage.</i>
1907-1913	7,519,109	1,074,159
1921-1927	5,968,683	852,669
1922-1928	6,176,137	882,305
1923-1929	6,676,121	953,732
1924-1930	6,877,204	982,458

Thus, as a first approximation, we might assume that in the seven year period 1931-1938, about 6,400,000 tons of shipping for British owners will be launched from yards in Great Britain and Ireland, or an average of 915,000 tons a year.

Now the total tonnage afloat belonging to Great Britain and Ireland in 1930 was 20,438,444 tons, whereas in 1923 it was 19,281,549, an increase of 1,156,895 tons. But the total tonnage launched in this country for British owners during the period 1924-1930 was 6,877,204 tons. Hence on the assumption that British

owners do not give orders to foreign builders, the replacements account for the difference between the two figures, namely, 5,720,309 tons or an average of 817,187 tons. On the 1923 figures of total tonnage belonging to this country, this works out at approximately 4.2 per cent. per annum.

If the assumptions, therefore, made in this argument are justified, namely, that British owners order almost exclusively from British yards—and the evidence to the Committee on Industry and Trade bears out this point—and if additions to the fleet of ships owned by Great Britain and Ireland are not due to any appreciable extent to purchases of second-hand vessels from foreign owners, which in any case is less than the sales of ships to foreign owners, then we may take Mr. Ayre's estimate of 25 years as the average life of the tonnage afloat, but only in respect of that part of world shipping belonging to British owners. In this connection one may note that the Committee on Industry and Trade found that whilst between June, 1910, and June, 1914, the world's merchant fleet increased at an average rate of 4 per cent., which is also the average rate per cent. for the period 1900-1914, shipbreaking and marine losses accounted for $2\frac{1}{2}$ per cent. per annum. The figure of $2\frac{1}{2}$ per cent. corresponds with our figure of replacement of 2.7 per cent.

Let us then apply the two factors to the two portions of world tonnage afloat in 1930, viz., that belonging to Great Britain and Ireland and that belonging to the rest of the world.

World Tonnage afloat in 1930	...	...	...	...	69,607,644
Tonnage belonging to Great Britain and Ireland	...	...	...	...	20,438,444
Tonnage belonging to rest of world	...	...	...	...	49,169,200

Now 2.7 per cent. of 49.2 million tons = 1,328,400 tons.

How much of this 1.3 million tons may we hope to build in this country? During the three years 1928-1930, of the total of tonnage launched in this country and abroad for, presumably, other than British owners, the yards in this country appear to have launched 23.4 per cent. In 1928, the proportion was about 18.9 per cent., in 1929, about 16.9 per cent., in 1930, about 31.6 per cent. Assuming we can retain a proportion of 23.4 per cent., our share of the 1,328,000 tons would amount to about 301,000 tons. If to this we add 4.2 per cent. of 20,438,444 tons—the British proportion—viz., 858,000 tons, we get a total of 1,159,000 tons.

Finally, if to this we add 50 per cent. of the 410,000 tons which we noticed as being probably due to anticipated demand for extra tonnage, we get a total of roughly 1,364,000 tons. Our estimate, on the assumptions we have mentioned, therefore comes to about 1,364,000 tons per annum, or about 136,000 tons less than that of Mr. Ayre.

The Share of the North East Coast.

Assuming, then, that the average demand on British yards for new merchant tonnage during the next five years is likely to be about 1,364,000 tons, what proportion of this is likely to be given to the shipbuilding yards on the North East Coast?

We have seen that in the four years, 1927-1930, the North East Coast's proportion of British and Irish output was 43.9 per cent. Is this proportion likely to continue? We must not lightly assume that it will. We have already seen that it was 51.1 per cent. in the period 1900-1904, and 50.7 per cent. in the period 1909-1913. Moreover, we have seen that in recent years the North East Coast has been largely dependent on the construction of tankers. There are signs that the output of tankers recently has been in excess of world requirements. If this be so, there is likely to be a lull in the building of tankers during the next few years. In June, 1930, the tanker tonnage afloat and under construction amounted to about 11 million tons, dead weight, and it is anticipated that by the end of 1931 this will have increased to about 13.2 million tons, an increase at the rate of about 11 per cent. per annum. This rate of increase is greater than the annual increase either of oil production or of consumption. On the other hand, the world consumption of oil shows a fairly steady rate of increase, and seems likely to continue. But there is now closer combination among oil companies, especially in their marketing organization. Thus, by geographical arrangements, a good deal of the cross-carriage of oil may be avoided, thus reducing the amount of shipping required for its distribution. The more rapid corrosion of tankers means, however, that their replacement factor should be higher than that of ordinary cargo vessels, and this should prove of some importance to the shipbuilding industry of the North East Coast. On the whole we are inclined to the view—unless the production of oil from coal becomes commercially possible—that the North East Coast may, in two or three years' time, and possibly less, count on the normal annual amount of tanker construction.

The second point we have to consider is the effect which the decline in the exports of coal from the North East is likely to have on shipbuilding. In the past this Area had a big Scandinavian connection, both in shipbuilding and ship-repairing, especially the latter, due largely to its exports of coal to, and imports of timber from, those countries. But the coal trade has been largely lost to Poland, and the connection is not what it used to be. Moreover, these countries are keener competitors with us than formerly in the construction both of tankers and motor vessels.

With so many cross currents it is difficult to forecast what the North East Coast's proportion of British output will be in the course of the next five or ten years. But bearing in mind that the North East Coast is the chief tanker building centre, not only of this

country, but of the world, having built during the last seven years one-third of the world output of tankers, and very nearly one-and-a-half times as many as the rest of Great Britain and Ireland together, and that she can probably build them cheaper and better than any other centre ; that she is unsurpassed in the building of certain types of cargo boats ; that the Tyne is capable of undertaking the largest Atlantic liners ; that her equipment and workmen are at least equal to those of any other centre in this or any other country ; we take the view that the North East Coast ought to be able to retain her proportion of about 45 per cent. of British output. This would amount to an average output of about 614,000 tons ; or a fluctuation from about 400,000 tons in a slump year to about 800,000 tons in a boom year.

To this would have to be added a proportion of any warship tonnage likely to be built. In the present state of opinion regarding disarmament, it is impossible for us to give any estimate of this.

(xvii) Rationalization in the Shipbuilding Industry.

We have seen that the maximum capacity of shipbuilding yards in Great Britain and Ireland is probably from 20 to 40 per cent. greater than in the immediate pre-war period ; and further that the future demand for British-built ships is unlikely to be greater than from 1,364,000 to 1,500,000 tons, which is about the average of 1,449,472 tons for the seven pre-war years, 1907 to 1913.

The situation confronting the shipbuilding industry in this country is one, therefore, identical with that confronting certain other of our staple industries, such as the coal mining industry and the cotton industry. The problem is how to eliminate the redundant shipyard capacity and so secure more economic costs of production by the concentration of work in fewer yards. This problem has been tackled by the shipbuilders themselves, practically the whole of whom have joined in a collective scheme to achieve the end in view. The firms who have joined in the scheme together built over 93 per cent. in tonnage, and a still larger percentage in value, of the ships of 300 feet or more in length launched in 1930 in Great Britain, Northern Ireland, and the Irish Free State.

In order to carry out the scheme a company was formed in February, 1930, called National Shipbuilders' Security Ltd. Its main purpose is to assist the shipbuilding industry by the purchase and dismantling of redundant and obsolete yards, the disposal of their equipment, and the re-sale of their sites under restrictions against their further use for shipbuilding in the future. The Company has a share capital of £10,000 and borrowing powers up to £2,500,000. Each of the firms who are parties to the scheme has executed a deed of covenant for the payment to the Company of a levy equal to 1 per cent. of the contract or sale price

of the vessels commenced to be built by the firm after the 1st November, 1930, and payable after completion of the vessels. The obligation of the shipbuilder to pay the levy continues until the whole of the Debenture Stock of the Company has been redeemed and each shipbuilder undertakes on any lease or sale of a shipyard to bind the purchaser or lessee to carry out all the obligations of the deed of covenant. Into the details for the security of the debenture holders it is unnecessary to go here. It is sufficient to say that the scheme was approved by the Bankers' Industrial Development Company Ltd. We are concerned almost solely with the degree of success it has achieved in fulfilling its main purpose.

Since it commenced operations the Company has purchased and closed down the following yards :—

1. Messrs. Beardmore's passenger liner and warship building yard at Dalmuir.
2. Messrs. Napier and Millar's cargo vessel yard at Old Kilpatrick.
3. Ardrossan Dockyard Ltd's south cargo vessel yard at Ardrossan.
4. The small shipyard and engineering works of Messrs. J. Chambers, Ltd., at Lowestoft.

These were the first purchases ; since then the following shipyards on the North East Coast, all of which were equipped for the building of merchant ships, have been purchased for dismantling :—

5. The Stockton-on-Tees yard of Messrs. Smith's Dock Co., Ltd.
6. The yard of Messrs. Craig, Taylor & Co., Ltd., Stockton.
7. The Cleveland Shipbuilding Co., Ltd., Middlesbrough.
8. The Whitby Shipbuilding Co., Ltd.
9. Messrs. Osborne, Graham & Co., Ltd., Sunderland.
10. Messrs. Charles Rennoldson & Co., Ltd., South Shields.
11. Messrs. Renwick & Dalgleish, Hebburn.
12. The Northumberland Shipbuilding Co., Ltd., Howdon-on-Tyne.

It will be noticed that in some cases the whole firm has been purchased, whilst in others only certain yards. Thus Messrs. Smith's Dock Co., Ltd., are concentrating their shipbuilding at their South Bank yard on the Tees, and continuing their ship-repairing work at North Shields and on the Tees.

The Company has so far dealt with 12 different yards, chiefly on the Clyde and the North East Coast, involving 71 building berths with a total annual capacity of almost half a million tons. The progress made in the short time during which the Company has been operating is considerable. But it is clear that further progress will not be easy. A number of very difficult problems are involved. The directors of the Company have already declared that it is no part of their policy to reduce capacity to monopoly limits. They probably realise that to attempt to do so would react on the interests of the shipowners on the one hand and the shipbuilding workmen on the other. But since it is estimated that a reduction of one shipyard in eight will enable the remaining yards to bear the full 1 per cent. levy on output without increase to their costs of production, it is easy to see that the directors may not be able to

resist the temptation to carry the process of elimination nearer to monopoly limits than are desirable in the interests of those named or of the country as a whole.

The second problem is to secure in the elimination of redundant yards a balance, first of all between the different shipbuilding centres of the country, and secondly between the yards suitable for the various types of ships to be built, liners of different sizes, cargo boats, oil tankers, and the like. The second part of this problem is a technical one and is one which on the whole we can leave to those engaged in the industry to decide. But the first part of the problem is one into which a number of considerations enter, considerations of sentiment, political considerations, both national and local, and similar questions. Here then is a problem which can probably be best solved if those responsible for the policy of the Company are willing to consult freely such a body as the Economic Advisory Committee of the Cabinet, or such Ministers of State as the President of the Board of Trade and the Minister of Labour.

It is obvious that to secure and maintain the financial soundness of the scheme the Company will have to go cautiously. Undue haste would only raise the prices to be paid for the yards to be eliminated. On the other hand the present depression whilst it obscures the immediate advantage to the firms left in the industry may induce them to attempt a rate of progress which may ultimately be found to have been unwise.

The alternative to such a scheme is to allow the less efficient yards to be wiped out by the stress of competition. And many firms, as the records show, have been forced to close down permanently. But experience has shown that there is a danger in this to the firms left in the industry. A shipyard sold "under the hammer" might be snapped up by a speculator for a mere song; and consequently there would be no diminution in output capacity. The whole object of the scheme is to prevent this, and to provide a market for the firm which is forced to close down. The National Shipbuilders' Security Ltd. is prepared to give such a firm rather more than it would get in the open market, feeling that the industry as a whole will reap the benefit. By the concentration of work in a smaller number of yards overhead expenses, which in any case are very heavy, should be greatly reduced. It is estimated that the buying up and closing down permanently, of, say, one-third of the output capacity of the industry of 1929 or 1930, will be quite easily covered by a levy on the production of the remaining yards over a short period of years.

It does not follow, however, that the least efficiently equipped yards will be the ones to go. As a general rule, no doubt, such will be the case. But it may well happen that a firm with a relatively well equipped yard may get into financial difficulties,

and have to close down ; whilst a less efficiently equipped yard may weather the storm. Under the scheme, as it stands, it is difficult to see how the possibility of this can be avoided. This does not affect the merits of the scheme so far as the members of the Company are concerned, in fact it rather enhances their position. But from a wider point of view, the result is, of course, undesirable. The yards to dismantle are the least efficiently equipped, and not the better equipped ones.

(xviii) Labour in the Shipbuilding and Ship-Repairing Industry.

In the statistics available it is impossible to distinguish between labour employed in shipbuilding proper from that employed in ship-repairing. We must therefore consider the industry as a whole.

The numbers of insured persons in the industry, as estimated from the exchange of Unemployment Insurance cards in July each year are, for the country as a whole, as follows :—

Year.	Great Britain.			Great Britain and Northern Ireland.		
	Males.	Females.	Total.	Males.	Females.	Total.
1923 ...	241,810	3,720	245,530	265,970	4,000	269,970
1924 ...	229,610	3,150	232,760	250,800	3,430	254,230
1925 ...	218,420	3,110	221,530	236,770	3,350	240,120
1926 ...	205,380	3,130	208,510	219,750	3,350	223,100
1927 ...	200,010	3,170	203,180	212,660	3,370	216,030
1927 ...	192,850	3,140	195,990	205,140	3,340	208,480
1928 ...	188,290	3,070	191,360	199,170	3,260	202,430
1929 ...	189,630	2,850	192,480	201,430	3,070	204,500
1930 ...	189,320	2,990	192,310	201,530	3,190	204,720
1931 ...	180,990	2,800	183,790	192,400	2,990	195,390

Figures below the double line refer to persons aged 16 to 64; those above the double line to persons aged 16 and over.

There are, unfortunately, no comparable statistics on this basis for the years prior to 1923.

It will be seen that the number in the industry fell from 1923 to 1927. Unfortunately a change in the age group from " 16 and over " to " 16 to 64 inclusive " makes comparison of the years since 1927 with those up to 1927 difficult. But the Ministry of Labour returns give figures for 1927 for both age categories, and from these we find that the ratio is 96.2 per cent. Assuming this

factor to be approximately true of the earlier years and recalculating the figures for the earlier years we obtain the following table:—

Estimated number of workpeople, ages 16-64, insured at July each year in shipbuilding and ship-repairing.

Year.	Great Britain and N. Ireland.	Index No. of Change 1924=100.	North East Survey Area.	Index No. of Change 1924=100.	Percentage proportion N.E. to Gt. B. and N.I.	Index No. of Change 1924=100.	Percentage proportion N.E. to all industries in N.E.	Index of Change 1924=100.
1923	259,800	106.3	59,810	100.4	23.0	94.3	8.8	100.2
1924	244,500	100.0	59,585	100.0	24.4	100.0	8.7	100.0
1925	231,000	94.5	—	—	—	—	—	—
1926	214,600	87.8	—	—	—	—	—	—
1927	208,480	85.3	51,890	87.1	24.8	102.1	7.6	87.0
1928	202,430	82.8	—	—	—	—	—	—
1929	204,500	83.6	54,350	91.2	26.6	109.0	7.9	90.0
1930	204,720	83.7	54,710	91.8	26.7	109.4	7.8	89.5
1931	195,390	79.9	51,100	85.8	26.15	107.2	7.2	82.0

We see, therefore, on the assumption named, that since 1923 the number of persons, ages 16-64 in the industry in Great Britain and Northern Ireland insured at July each year, has fallen continuously except for a slight recovery in 1929 and 1930; and the fall in 1931 compared with 1924 is no less than 20.1 per cent.

The corresponding figures for the Survey Area also show a decline; but the fall from 1924 to 1931 is only 14.3 per cent.

The decline in the numbers of insured workers in the industry on the North East Coast is therefore proportionately less than in Great Britain and Ireland.

Unemployment.

The following table shows the estimated numbers of employed and unemployed persons, ages 16-64, in the industry in the Survey Area. The unemployment figures are for some date in June of each year.

Year.	Insured Persons.	Employed.	Unemployed.	Percentage Unemployed.		
				N.E. Area.	Great Britain and Ireland.	
1923	...	59,810	23,300	36,510*	61.0	44.1
1924	...	59,585	39,150	20,435	34.2	27.4
1927	...	51,890	36,000	15,890	30.5	23.0
1929	...	54,350	39,840	14,510	26.6	22.5
1930	...	54,710	34,850	19,860	36.4	30.7
1931	...	51,100	15,040	36,060	70.6	56.6

* Unemployment in the Shipbuilding Industry was affected by the Boilermakers Dispute.

For the reasons mentioned in the special report on labour we are a little doubtful whether the figure for insured workers—as obtained by the exchange of books in July—really represents the total of workers available in the industry at that date; and if our suspicions are well founded the percentage unemployed may only be very approximately true. But on the assumption that the errors are small, we see that the percentage unemployed in the North East Area in June each year is markedly higher than the percentage unemployed in the shipbuilding industry of Great Britain and Northern Ireland as a whole. This would seem to indicate that proportionately more persons have remained attached to the industry on the North East Coast in relation to the tonnage output, than in the case of the rest of the country. To what this fact is due it is impossible for us to say. But it certainly gives point to the conclusions reached in the Report on the Engagement of Shipyard Labour, which was sent forward to the Ministry of Labour last year by a joint conference of the Local Employment Committees on Tyneside. The scheme submitted in the Report was one for the pooling of shipyard labour along the river, and for modifications in the mode of engagement of shipyard labour, which it was argued would reduce the total number of persons required to be attached to the industry, and would reduce considerably the amount of unemployment among those remaining in the industry. We are of opinion that this scheme should be re-examined, and a serious attempt made to induce both the employers' and the workers' organizations to give it a trial. The scheme was hammered out by a sub-committee on which both employers and workers in the industry were fully represented, and they were definitely of opinion that the scheme was a practicable and desirable one.

Effects of Changes in Methods of Construction on the Demand for Shipyard Labour.

One of the main purposes of the Survey was to investigate the extent to which labour had been displaced in the industry by the greater use of mechanical appliances, and by other changes in the methods of construction. We have already alluded to the extended use of the pneumatic riveter, and the introduction of a plate punching machine on the one hand; and on the other to the tendency—for at present it is little more than a tendency—to increase the amount of "fabrication" or "expansion" work.

Unfortunately it has been found impossible to obtain any statistical measure of the effects of these changes on employment. The changes have been introduced gradually and the firms in the industry have no figures to show the result of the changes.

Attempts have been made at different times to measure these changes statistically. In the monthly report of the Boilermakers' Society for January, 1931, figures are given purporting to show the tonnage launched per man employed. The figures given range

from 3.2 tons per man in 1923 to 6.6 in 1920, 7.6 in 1924, 9.3 in 1928, and 9.9 in 1929. It is hardly necessary to point out that such a method is statistically unsound. In the first place the numbers employed are obtained by subtracting the numbers unemployed on a given date from the number of "members in the industry". The latter is presumably obtained from the exchange of Unemployment Insurance cards in July each year, the validity of which we have already questioned. But even if they are a correct measure of those attached to the industry, the number of men employed does not represent the average number of men employed during the year. In any case, too, they include men employed in ship-repair work, the amount of which is not a constant proportion of the tonnage of new vessels launched. Moreover, launching figures are not a safe guide to the amount of work being done during any one year, though it may be so taken over a period of five or seven years. If a comparison of this kind is to be made, the statistics chosen should be those of work under construction at a date as close as possible to the date of the numbers of men employed. Even then it is impossible to include the amount of work in the repair yards, or exclude the workers engaged on such repair work. We have, however, made a comparison on these lines. The figures for persons employed are taken for about the same day in June each year; and those for tonnage under construction from Lloyd's Register which relate to the end of June each year. The table so obtained is as follows:—

Year.	North East Coast.			Great Britain and Ireland.		
	Persons employed.	Tonnage under construction.	Tons per person employed.	Persons employed (approximate).	Tonnage under construction.	Tons per person employed.
1923 ...	23,300*	453,787	19.5	145,200	1,337,759	9.2
1924 ...	39,150	509,804	13.0	177,500	1,516,746	8.5
1927 ...	36,000	506,919	14.1	160,600	1,390,388	8.7
1929 ...	39,840	500,482	12.6	158,500	1,453,906	9.2
1930 ...	34,850	507,063	14.55	141,900	1,392,063	9.8
1931 ...	15,040	164,929	11.0	84,800	555,603	6.6

* See note on page 268.

The results of the comparison are, at first sight, surprising. There is, first, the marked difference between the tonnage per man in the North East Coast ports as compared with the rest of the country. However much we may think that the organisation and equipment of the yards in our Area and the workmanship of our men are superior to those of the rest of the country, we are unable to believe that so marked a difference as this exists. Secondly,

the tonnage per man varies inexplicably. We should expect a low tonnage figure, as in 1931, when the work in hand is abnormally low, since in shipbuilding, as in other industries, it is probably impossible to reduce the number of workers proportionately to the volume of work. But a comparison of the tonnage figures for the other years convinces us that the method is statistically unsound, and that no valid conclusions are to be drawn from it, in spite of the fact that we have taken tonnage under construction in place of tonnage launched. It is, we think, obvious that the table ignores certain factors, which cannot safely be left out of account. These are (1) the amount of repair work and the proportion of workers employed on it; (2) that different types of vessels provide employment for widely varying numbers of men. Thus a much smaller number of men are required in the building of an ordinary cargo vessel or tanker than of a passenger vessel of similar size; whilst warship work, which has declined so greatly since the War, gives far more employment to men than mercantile vessels of the same tonnage; (3) the design and methods of construction of vessels have changed considerably during recent years.

We, therefore, feel that such a method of calculation leads to no trustworthy conclusions. All that we feel entitled to say is, first, that there has been a considerable reduction in the number of men attached to the industry, more marked, as we have seen, in the rest of the country than on the North East Coast; and, secondly, that there are signs that the shipbuilding output per man employed has increased. Much of the increase is due to better organization in the yards and to the extended, and extending, adoption of mechanical methods; but some of it is also probably due to the fact that, in view of the difficult position in which the industry has been placed, the relations between the employers and the workers have been improved, there is greater co-operation between them, and both have realised that only good and efficient work will enable the industry in this country to hold its own against the increasing severity of foreign competition. Employers have, more than once in recent years, paid a tribute to the work of the men in the shipyards. It is, therefore, but natural that with greater zeal on both sides the output per man employed should increase.

(xix) The Future Demand for Shipyard Labour on the North East Coast.

We must confess that we enter with considerable misgivings on making an estimate of the future demand for labour in the shipbuilding industry of the North East Coast. The factors which go to determine that demand are so difficult to determine, and the assumptions to be made so very broad, that we should have preferred not to enter upon the task. But since this is one of the main purposes of the Survey, we feel that we must make some attempt to do so.

In our estimate of the future demand for ships we came to the conclusion that providing the North East could retain about 45 per cent. of the tonnage to be built in this country, we might look for an average annual output of tonnage launched from North East ports of about 614,000 tons, fluctuating from about 400,000 tons in lean years to about 800,000 tons in good years. This is exclusive of any warship tonnage that may come to the North East ports, a quantity so doubtful that we are forced to leave it out of account. From this point of view, therefore, 1924 when 631,000 tons were launched or 1928 with 641,000 tons might be regarded as rather better than average years; 1922 when 432,000 tons were launched or 1925 with 382,000 tons launched, as lean years, and 1929, with 679,000 tons the nearest approach to a boom year in the later post-war period.

We have no figures for the North East Coast for 1928 but in 1924 the number of insured persons in the industry in the North East Survey Area in July was 59,585 of whom 39,150 were employed on a given date in June, the percentage unemployed being given as 30.5. In 1929, the number of insured persons in July was 54,350, of whom 39,840 were employed on a given date in June, when the percentage unemployed is given as 26.6. Unfortunately we have no corresponding figures for 1922 or 1925.

What we require to know is the monthly average number of persons employed in the Area in each of the years 1922, 1924, 1925, 1928, and 1929. Unfortunately these figures are not available. We have therefore to make the very risky assumption that the June figure of persons employed is approximately the monthly average for the year. On the figures before us we are inclined to the view, that except for abnormally lean years, such as 1923 and 1931, the number of persons employed in the industry will range from about 30,000 to about 40,000.

If the range of employment in the near future be of this order of magnitude, it follows that in lean years a percentage unemployment figure of about 33.0 may be looked for, quite apart from the amount of labour which may be regarded as definitely surplus to the industry in the North East Area. This question of surplus labour we discuss in the following sections.

In July, 1923, the number of insured persons in the industry in the Survey Area is given as 59,810. This number had dropped to 54,350 in 1929, to 54,710 in 1930, and 51,100 in 1931. These figures indicate that there is an appreciable flow into and out of the industry, which on general grounds is to be expected. Taking the average of the years 1929 to 1931 we get a figure of about 53,000. On the assumption, therefore, that the estimates of future demands are at all near the mark, there would seem to be a labour surplus in the North Eastern section of the industry of somewhere about 13,000, even during its busiest periods. We must, however, again utter a caution that this figure is based on very slender

statistical foundations, and we do not regard it as being anything more than a reasoned guess.

Further it must be borne in mind that this figure of 13,000 is merely a total of all grades of workers in the industry. It does not follow that there will be a surplus, much less a proportionate surplus, of all grades of labour. In fact the view has been expressed to us by the employers that in the near future there may be definite shortage of certain grades of skilled workers in the North East Area, particularly riveters. On the other hand the workers' organisations take the view that under no conceivable conditions in the near future is there likely to be a shortage of any class of skilled workers. In the case of riveters they point out that caulkers are now much less in demand than hitherto owing to changes in methods of construction, and that in case of need caulkers can easily be switched over to riveting work, if any abnormal demand for riveters occurs. Between these two opposed views it is impossible for us to judge what the real situation is likely to be.

That there are changes in the proportions of skilled, semi-skilled, and unskilled men employed in the industry is clear from a return which the Shipbuilders' Association has been kind enough to obtain for us. It is shown in the following table :—

Return of the number of men, boys, and apprentices employed in shipyards on the North East Coast at the undermentioned dates, showing the percentage of skilled, semi-skilled, and unskilled men and boys.

Date.	Total Employees.		Percentages of Men and Boys.			
	Men and Boys.	Apprentices.*	Skilled.	Semi-skilled.	Unskilled.	Miscellaneous.
March, 1913 ...	37,042	5,701	47·04	12·58	25·16	15·22
March, 1925 ...	17,004	3,855	49·47	17·28	22·61	10·64
Sept., 1930 ...	16,836	3,471	47·61	15·11	32·78	4·50

* Not included in Men and Boys.

It will be seen that the percentage of skilled men has remained fairly constant in the three periods whilst the proportion of semi-skilled men has perceptibly increased; but that probably owing to changes in classification, and the reduction of the numbers in the miscellaneous classes, the percentage proportion of unskilled men, which showed a decrease in 1925, showed a considerable increase in 1930. The table is therefore not completely satisfactory, and we could have wished for further information on this point. But the return involves a considerable amount of work in compilation and we have felt unable to press for a fuller return.

APPENDIX: STATISTICAL TABLES.

TABLE I.—Gross Tonnage of Merchant Vessels Launched 1897–1930 (From Lloyd's Register, Annual Summary of Shipbuilding, 1930).

Year.	Great Britain and Ireland.			Abroad.			World.		
	Tonnage Launched	Moving Sum (centred). 5 years period.	Moving Average (centred). 5 years period.	Tonnage Launched.	Moving Sum (centred). 5 years period.	Moving Average (centred). 5 years period.	Tonnage Launched.	Moving Sum (centred). 5 years period.	Moving Average (centred). 5 years period.
1897 ...	952,486	—	—	379,438	—	—	1,331,924	—	—
1898 ...	1,367,570	—	—	525,773	—	—	1,893,343	—	—
1899 ...	1,416,791	6,704,057	1,340,811	704,947	3,564,650	712,930	2,121,738	10,268,707	2,053,741
1900 ...	1,442,471	7,179,129	1,435,826	861,692	4,260,409	848,082	2,304,163	11,439,538	2,287,908
1901 ...	1,524,739	7,002,177	1,400,435	1,092,800	4,689,649	937,930	2,617,539	11,691,826	2,338,365
1902 ...	1,427,558	6,790,548	1,358,109	1,075,197	4,767,475	953,495	2,502,755	11,558,023	2,311,604
1903 ...	1,190,618	6,971,245	1,394,249	955,013	4,797,537	959,507	2,145,631	11,768,782	2,353,756
1904 ...	1,205,162	7,274,849	1,454,970	782,773	4,796,157	959,231	1,987,935	12,071,006	2,414,201
1905 ...	1,623,168	7,455,181	1,491,036	891,754	4,891,158	978,232	2,514,922	12,346,339	2,469,268
1906 ...	1,828,343	7,194,232	1,438,846	1,091,420	4,839,762	967,952	2,919,763	12,033,994	2,406,798
1907 ...	1,607,890	6,980,136	1,396,027	1,170,198	4,667,980	933,596	2,778,088	11,648,116	2,329,623
1908 ...	929,669	6,500,137	1,300,027	903,617	4,590,910	918,182	1,833,286	11,091,047	2,218,209
1909 ...	991,066	6,475,638	1,295,128	610,991	4,345,786	869,157	1,602,057	10,821,424	2,164,285
1910 ...	1,143,169	6,606,262	1,321,252	814,684	4,338,843	867,769	1,957,853	10,945,105	2,189,021
1911 ...	1,803,844	7,608,746	1,521,749	846,296	4,835,955	967,191	2,650,140	12,444,701	2,488,940
1912 ...	1,738,514	8,301,233	1,660,247	1,163,255	5,394,164	1,078,833	2,901,769	13,695,397	2,739,080
1913 ...	1,932,153	7,808,983	1,561,797	1,400,729	5,130,199	1,026,040	3,332,882	12,939,182	2,587,837
1914 ...	1,683,553	6,613,374	1,322,675	1,169,200	5,363,748	1,072,749	2,852,753	11,977,122	2,395,424

1915	...	650,919	6,037,756	1,207,551	550,719	5,975,383	1,195,076	1,201,638	12,013,139	2,402,627
1916	...	608,235	5,453,723	1,090,744	1,079,845	8,673,978	1,734,796	1,688,080	14,127,701	2,825,540
1917	...	1,162,896	5,390,612	1,078,122	1,774,890	13,023,885	2,605,777	2,937,786	18,419,497	3,683,899
1918	...	1,348,120	6,795,317	1,359,063	4,099,324	16,284,208	3,256,842	5,447,444	23,079,525	4,615,905
1919	...	1,620,442	7,725,134	1,545,027	5,524,107	18,023,154	3,604,631	7,144,549	25,748,288	5,149,658
1920	...	2,055,624	7,593,319	1,518,664	3,806,042	17,684,267	3,536,853	5,861,666	25,277,586	5,055,517
1921	...	1,538,052	6,890,850	1,378,170	2,818,791	14,582,473	2,916,495	4,356,843	21,473,323	4,294,665
1922	...	1,031,081	6,710,293	1,342,059	1,436,003	9,866,232	1,973,246	2,467,084	16,576,525	3,315,305
1923	...	645,651	5,739,302	1,147,860	997,530	7,168,961	1,433,792	1,643,181	12,908,263	2,581,652
1924	...	1,439,885	4,840,818	968,163	807,866	5,385,579	1,077,116	2,247,751	10,226,397	2,045,279
1925	...	1,084,633	5,035,610	1,007,122	1,108,771	5,009,382	1,001,876	2,193,404	10,044,992	2,008,998
1926	...	639,568	5,835,879	1,167,176	1,035,409	5,265,171	1,053,034	1,674,977	11,101,050	2,220,210
1927	...	1,225,873	5,918,617	1,183,723	1,059,806	5,727,892	1,145,578	2,285,679	11,646,509	2,329,301
1928	...	1,445,920	6,312,547	1,262,509	1,253,319	6,030,030	1,206,006	2,699,239	12,342,577	2,468,515
1929	...	1,522,623	* 5,672,979	* 1,418,245	1,270,587	* 4,994,621	* 1,248,655	2,793,210	* 10,667,600	* 2,666,900
1930	...	1,478,563	—	—	1,410,909	—	—	2,889,472	—	—

* Four years, 1927-30.

TABLE 2.—Gross Tonnage of Merchant Vessels Launched (i) in the World, (ii) in Great Britain and Ireland, (iii) at the North East Ports, 1897–1930.

(From Lloyd's Register, Annual Summary of Shipbuilding.)

Year.	World.	Great Britain and Ireland.			North East Ports.		
	Tonnage Launched.	Tonnage Launched.	Moving Average 5 years period.	(2) As a Percentage of (1).	Tonnage Launched.	Moving Average 5 years period.	(5) As a Percentage of (2).
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1897 ...	1,331,924	952,486	—	71·5	—	—	—
1898 ...	1,893,343	1,367,570	—	72·2	—	—	—
1899 ...	2,121,738	1,416,791	1,340,811	66·8	—	—	—
1900 ...	2,304,163	1,442,471	1,435,826	62·6	794,300	—	55·1
1901 ...	2,617,539	1,524,739	1,400,435	58·2	872,723	—	57·2
1902 ...	2,502,755	1,427,558	1,358,109	57·0	701,005	724,190	49·1
1903 ...	2,145,631	1,190,618	1,394,249	55·5	581,343	739,793	48·8
1904 ...	1,987,935	1,205,162	1,454,970	62·0	671,580	766,278	53·7
1905 ...	2,514,922	1,623,168	1,491,036	64·5	872,314	789,579	53·7
1906 ...	2,919,763	1,828,343	1,438,846	62·6	1,005,148	744,482	55·0
1907 ...	2,778,088	1,607,890	1,396,037	57·9	817,510	697,128	50·8
1908 ...	1,833,286	929,669	1,300,027	50·7	355,859	638,328	38·3
1909 ...	1,602,057	991,066	1,295,128	61·9	434,810	632,754	43·9
1910 ...	1,957,853	1,143,169	1,321,252	58·4	578,315	646,988	50·6
1911 ...	2,650,140	1,803,844	1,521,749	68·1	977,278	770,638	54·2
1912 ...	2,901,769	1,738,514	1,660,247	59·9	888,681	854,616	51·1
1913 ...	3,332,882	1,932,153	1,561,797	58·0	974,109	809,518	50·4
1914 ...	2,852,753	1,683,553	1,322,675	59·0	854,697	684,751	50·8

1915	...	1,201,638	650,919	1,207,551	54·2	352,825	620,262	54·2
1916	...	1,688,080	608,235	1,090,744	36·0	353,445	581,811	58·1
1917	...	2,937,786	1,162,896	1,078,122	39·6	611,233	554,131	52·6
1918	...	5,447,444	1,348,120	1,359,063	24·7	736,858	673,346	54·7
1919	...	7,144,549	1,620,442	1,545,027	22·7	716,295	735,208	44·2
1920	...	5,861,666	2,055,624	1,518,664	35·1	948,902	699,389	46·2
1921	...	4,356,843	1,538,052	1,378,170	35·3	662,753	603,126	43·1
1922	...	2,467,084	1,031,081	1,342,059	41·8	432,137	586,118	41·9
1923	...	1,643,181	645,651	1,147,860	39·3	255,542	472,909	39·6
1924	...	2,247,751	1,439,885	968,163	64·1	631,258	380,154	43·8
1925	...	2,193,404	1,084,633	1,007,122	49·4	382,855	407,166	35·3
1926	...	1,674,977	639,568	1,167,176	38·2	198,979	484,282	31·1
1927	...	2,285,679	1,225,873	1,183,723	53·6	567,197	493,894	46·3
1928	...	2,699,239	1,445,920	1,262,509	53·6	641,120	539,018	44·3
1929	...	2,793,210	1,522,623	—	54·5	679,321	—	44·6
1930	...	2,889,472	1,478,563	—	51·2	608,472	—	41·2

TABLE 3.—Gross Tonnage of Merchant Vessels Launched at the North East Ports, 1900–1930. (From Lloyd's Register, Annual Summary.)

Year.	Tonnage Launched at North East Ports.	Hartlepoons.		Middlesbrough, Stockton and Whitby.		Newcastle (i.e., Tyne and Blyth.)		Sunderland.	
		Tonnage Launched.	As Percentage of (1).	Tonnage Launched.	As Percentage of (1).	Tonnage Launched.	As Percentage of (1).	Tonnage Launched.	As Percentage of (1).
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1900 ...	794,300	a140,623	17·7	b144,164	18·1	265,142	33·4	244,371	30·8
1901 ...	872,723	a150,607	17·3	b161,058	18·4	292,989	33·6	268,069	30·7
1902 ...	701,005	a 81,824	11·7	b108,230	15·4	280,860	40·1	230,091	32·8
1903 ...	581,343	a 80,808	13·9	b 91,675	15·8	219,360	37·7	189,500	32·6
1904 ...	671,580	a 96,154	14·3	b110,236	16·4	236,055	35·2	229,135	34·1
1905 ...	872,314	a124,006	14·2	b132,748	15·2	310,391	35·6	305,169	35·0
1906 ...	1,005,148	a144,603	14·4	b147,857	14·7	385,987	38·4	326,701	32·5
1907 ...	817,510	a 94,469	11·6	b138,621	17·0	292,814	35·8	291,606	35·6
1908 ...	355,859	a 37,843	10·6	b 57,210	16·1	174,259	49·0	86,547	24·3
1909 ...	434,810	a 57,712	13·3	b 62,492	14·4	182,235	41·9	132,371	30·4
1910 ...	578,315	a 86,295	14·9	b108,754	18·8	203,831	35·3	179,435	31·0
1911 ...	977,278	a135,557	13·9	b141,934	14·5	412,959	42·3	286,828	29·3
1912 ...	888,681	a121,725	13·7	b143,570	16·2	317,654	35·7	305,732	34·4
1913 ...	974,109	a153,071	15·7	b154,743	15·9	366,331	37·6	299,964	30·8
1914 ...	864,697	a124,419	14·5	b137,165	16·0	315,585	37·0	277,528	32·5
1915 ...	352,825	a 59,308	16·8	b 58,574	16·6	124,001	35·1	110,942	31·5
1916 ...	353,445	54,295	15·4	31,342	8·9	133,336	37·7	134,472	38·0
1917 ...	611,233	65,622	10·7	109,306	17·9	231,907	37·9	204,398	33·5
1918 ...	736,858	100,413	13·6	109,298	14·8	266,594	36·2	260,553	35·4
1919 ...	716,295	82,233	11·5	119,943	16·7	239,836	33·5	274,283	38·3

1920	...	948,902	73,221	7.7	195,452	20.6	365,775	38.6	314,454	33.1
1921	...	662,753	34,101	5.1	129,559	19.6	354,813	53.5	144,280	21.8
1922	...	432,137	18,822	4.4	45,814	10.6	240,788	55.7	126,713	29.3
1923	...	255,542	23,864	9.3	42,709	16.7	137,408	53.8	51,561	20.2
1924	...	631,258	55,804	8.9	105,707	16.8	275,672	43.8	194,075	30.8
1925	...	382,855	37,874	9.9	58,786	15.4	194,614	50.8	91,581	23.9
1926	...	198,979	14,814	7.5	22,369	11.2	126,609	63.6	35,187	17.7
1927	...	587,197	65,588	11.6	64,783	11.4	274,056	48.3	162,770	28.7
1928	...	641,120	39,743	6.2	93,223	14.5	300,508	46.9	207,646	32.4
1929	...	679,321	70,385	10.4	91,824	13.5	271,601	40.0	245,511	36.1
1930	...	608,472	39,481	6.5	71,935	11.8	323,750	53.2	173,306	28.5

^a Hartlepoons and Whitby.

^b Middlesbrough and Stockton only.

TABLE 4.—*Size of Merchant Vessels Launched (i) in the World, (ii) Abroad, (iii) Great Britain and Ireland, 1897–1930.*
 (From Lloyd's Register, Annual Summary.)

Year.	World.			Abroad.			Great Britain and Ireland.					
	No. of Vessels Launched.			No. of Vessels Launched.			Under 4,000 Tons.		4,000 to 8,000 Tons.		Over 8,000 Tons.	
	Under 4,000 Tons.	4,000 to 8,000.	Over 8,000 Tons.	Under 4,000 Tons.	4,000 to 8,000.	Over 8,000 Tons.	No.	Per-centage of (1).	No.	Per-centage of (2).	No.	Per-centage of (3).
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1897	—	—	—	—	—	—	538	—	51	—	5	—
1898	—	—	—	—	—	—	678	—	77	—	6	—
1899	—	—	—	—	—	—	623	—	90	—	13	—
1900	—	—	—	—	—	—	567	—	111	—	14	—
1901	—	—	—	—	—	—	499	—	129	—	11	—
1902	—	—	—	—	—	—	567	—	111	—	16	—
1903	—	—	—	—	—	—	614	—	71	—	13	—
1904	—	—	—	—	—	—	638	—	68	—	6	—
1905	—	—	—	—	—	—	652	—	130	—	13	—
1906	—	—	—	—	—	—	718	—	156	—	12	—
1907	—	—	—	—	—	—	695	—	130	—	16	—
1908	—	—	—	—	—	—	437	—	68	—	18	—
1909	—	—	—	—	—	—	433	—	84	—	9	—
1910	—	—	—	—	—	—	389	—	100	—	11	—
1911	—	—	—	—	—	—	561	—	185	—	26	—
1912	—	—	—	—	—	—	511	—	172	—	29	—
1913	—	—	—	—	—	—	455	—	199	—	34	—
1914	—	—	—	—	—	—	461	—	162	—	33	—

1915	...	...	...	—	—	—	—	—	—	259	—	55	—	13	—
1916	...	...	...	—	—	—	—	—	—	235	—	65	—	6	—
1917	...	...	...	—	—	—	—	—	—	139	—	122	—	25	—
1918	...	...	...	1,351	481	34	1,236	309	20	115	8.5	172	35.8	14	41.2
1919	...	...	...	1,732	714	37	1,319	530	22	413	23.8	184	25.8	15	40.5
1920	...	...	...	1,100	782	87	710	599	42	390	35.5	183	23.4	45	51.7
1921	...	...	...	901	370	108	634	251	68	267	29.6	119	32.2	40	37.0
1922	...	...	...	603	185	64	487	99	31	116	19.2	86	46.5	33	51.6
1923	...	...	...	554	110	37	392	64	23	162	29.2	46	41.8	14	37.8
1924	...	...	...	713	173	38	368	45	17	345	48.4	128	74.0	21	55.3
1925	...	...	...	537	173	51	316	71	32	221	41.2	102	59.0	19	37.3
1926	...	...	...	383	112	48	254	64	28	129	33.7	48	42.9	20	41.7
1927	...	...	...	507	191	51	283	67	28	224	44.2	124	64.9	23	45.1
1928	...	...	...	524	233	66	289	75	39	235	44.8	158	67.8	27	40.9
1929	...	...	...	691	235	64	380	84	37	311	45.0	151	64.3	27	42.2
1930	...	...	...	809	214	81	413	64	56	396	48.9	150	70.1	25	30.9

TABLE 5.—*Gross Tonnage of Merchant Vessels Launched in Great Britain and Ireland, showing countries for which intended, 1897–1930.*
(From Lloyd's Register, Annual Summary.)

Year.	Gross Tonnage Launched in Great Britain and Ireland.	Tonnage for Great Britain and Ireland.	(2) As Percentage of (1).	Tonnage for British Dominions.	(4) As Percentage of (1).	Tonnage for Rest of World.	(6) As Percentage of (1).
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1897	952,486	716,126	75·2	23,009	2·4	213,351	22·4
1898	1,367,570	1,061,642	77·6	19,022	1·4	286,906	21·0
1899	1,416,791	1,149,626	81·1	17,904	1·3	249,261	17·6
1900	1,442,471	1,109,165	76·9	17,960	1·2	315,346	21·9
1901	1,524,739	1,167,802	76·6	28,569	1·9	328,368	21·5
1902	1,427,558	1,156,765	81·0	40,966	2·9	229,827	16·1
1903	1,190,618	950,576	79·9	33,793	2·8	206,249	17·3
1904	1,205,162	979,993	81·3	33,542	2·8	191,627	15·9
1905	1,623,168	1,273,731	78·5	38,082	2·3	311,355	19·2
1906	1,828,343	1,457,262	79·7	39,237	2·1	331,844	18·2
1907	1,607,890	1,059,319	65·9	72,424	4·5	476,147	29·6
1908	929,669	554,995	59·7	67,518	7·3	307,156	33·0
1909	991,066	749,221	75·6	60,027	6·1	181,818	18·3
1910	1,143,169	919,702	80·5	43,507	3·8	179,960	15·7
1911	1,803,844	1,399,770	77·6	59,974	3·3	344,100	19·1
1912	1,738,514	1,322,995	76·1	72,970	4·2	342,549	19·7
1913	1,932,153	1,513,107	78·3	37,118	1·9	381,928	19·8
1914	1,683,553	1,273,530	75·6	36,736	2·2	373,287	22·2

1915 ...	...	...	650,919	—	—	—	—	—	—
1916 ...	...	...	608,235	—	—	—	—	—	—
1917 ...	...	...	1,162,896	—	—	—	—	—	—
1918 ...	...	...	1,348,120	—	—	—	—	—	—
1919 ...	...	...	1,620,442	—	—	—	—	—	—
1920 ...	...	...	2,055,624	1,209,221	58.8	9,815	0.5	836,588	40.7
1921 ...	...	...	1,538,052	946,182	61.5	66,373	4.3	525,497	34.2
1922 ...	...	...	1,031,081	762,769	74.0	33,092	3.2	235,220	22.8
1923 ...	...	...	645,651	626,805	97.1	8,594	1.3	10,252	1.6
1924 ...	...	...	1,439,885	1,218,944	84.7	51,528	3.6	169,413	11.7
1925 ...	...	...	1,084,633	906,169	83.5	50,839	4.7	127,625	11.8
1926 ...	...	...	639,568	549,660	86.0	17,408	2.7	72,500	11.3
1927 ...	...	...	1,225,873	958,154	78.2	113,254	9.2	154,465	12.6
1928 ...	...	...	1,445,920	1,153,636	79.8	122,972	8.5	169,312	11.7
1929 ...	...	...	1,522,623	1,262,753	82.9	31,033	2.1	228,637	14.8
1930 ...	...	...	1,478,563	827,988	56.0	81,514	5.5	569,061	38.5

TABLE 6.—Statement showing the Number and Tonnage of Mercantile Vessels built at the undermentioned ports during the years 1924–1930, exclusive of vessels built for Foreigners. (The figures are supplied by the Board of Trade.)

(For Mercantile Vessels built for Foreigners see separate table.)

Ports and Years.	Sailing Vessels.		Steam Vessels.			Motor Vessels.			Total:	
	No.	Tons Net.	No.	Tons		No.	Tons		No.	Tons Net.
				Net.	Gross.		Net.	Gross.		
Blyth—										
1924	1	208	9	9,982	16,821	—	—	—	10	10,190
1925	—	—	1	2,487	4,211	1	55	143	2	2,542
1926	2	188	—	—	—	1	55	138	3	243
1927	—	—	3	5,112	8,349	—	—	—	3	5,112
1928	1	61	4	12,437	20,041	2	6	9	7	12,504
1929	—	—	2	2,615	4,551	—	—	—	2	2,615
1930	—	—	1	2,038	3,433	—	—	—	1	2,038
Hartlepoons—										
1924	—	—	12	30,485	49,768	—	—	—	12	30,485
1925	—	—	9	22,487	37,809	—	—	—	9	22,487
1926	—	—	3	9,152	14,814	—	—	—	3	9,152
1927	—	—	11	34,704	56,584	—	—	—	11	34,704
1928	—	—	7	20,566	33,528	—	—	—	7	20,566
1929	—	—	12	38,584	62,966	—	—	—	12	38,584
1930	4	1,080	7	19,629	32,361	—	—	—	11	20,709
Middlesbrough—										
1924	5	1,440	31	23,077	39,657	2	2,936	5,155	38	27,453
1925	—	—	18	19,537	34,029	1	5,156	8,800	19	24,693
1926	9	2,181	9	5,133	8,881	—	—	—	18	7,314
1927	—	—	14	16,276	29,102	1	5,144	8,782	15	21,420
1928	1	376	23	26,019	42,490	1	7,175	11,905	25	33,570
1929	—	—	46	30,953	54,763	2	12,305	20,880	48	43,258

Year	Ports	No. of Vessels	Gross Tonnage	Net Tonnage	Number of Crew	Value of Cargo	Value of Passengers	Value of Mail	Value of Freight	Value of Other	Total Value		
1879-93	Ports—												
	1924	—	—	49	101,705	172,017	7	20,487	34,395	56	122,192
	1925	2	460	32	76,582	127,963	4	18,754	30,908	38	95,796
	1926	—	—	14	45,363	77,331	4	13,292	22,924	18	58,655
	1927	—	—	33	94,761	158,500	8	35,662	60,423	41	130,423
	1928	—	—	46	110,018	183,328	12	39,419	65,671	58	149,437
	1929	—	—	35	81,717	132,755	8	22,888	38,387	43	104,605
	1930	—	—	17	43,435	70,819	11	43,168	71,960	28	86,603
	Stockton—												
	1924	1	58	16	35,892	59,157	—	—	—	17	35,950
	1925	—	—	3	9,382	15,290	—	—	—	3	9,382
	1926	—	—	—	—	—	—	—	—	—	—
	1927	—	—	2	5,620	9,202	—	—	—	2	5,620
1928	...	...	—	—	—	—	—	—	—	—	—	—
1929	...	...	—	—	3	8,087	13,421	—	—	—	3	8,087
1930	...	...	—	—	8	5,679	10,206	—	—	—	8	5,679
Sunderland—													
1924	...	...	—	—	50	99,094	166,110	6	17,052	28,094	56	116,146
1925	...	...	—	—	17	39,278	65,024	3	9,493	16,100	20	48,771
1926	...	...	—	—	6	14,875	24,510	2	6,187	10,610	8	21,062
1927	...	...	—	—	28	66,278	111,348	6	20,694	35,185	34	86,972
1928	...	...	—	—	34	83,452	140,145	8	22,612	37,540	42	106,064
1929	...	...	—	—	41	101,434	168,888	6	18,638	32,358	47	120,072
1930	...	...	2	416	18	38,904	65,920	2	8,944	15,836	22	48,264
Total of above—													
1924	...	...	7	1,706	167	300,235	503,530	15	40,475	67,644	189	342,416
1925	...	...	2	460	80	169,753	284,326	9	33,458	55,951	91	203,671
1926	...	...	11	2,369	32	74,523	125,536	7	19,534	33,672	50	96,426
1927	...	...	—	—	91	222,751	373,085	15	61,500	104,390	106	284,251
1928	...	...	2	437	114	252,492	419,532	23	69,212	115,125	139	322,141
1929	...	...	—	—	139	263,390	437,344	16	53,831	91,625	155	317,221
1930	...	...	6	1,496	66	121,751	204,224	14	53,239	89,767	86	176,486
Totals			28	6,468	689	1,404,895	2,347,577	99	331,249	558,174	816	1,742,612	

Sailing Vessels under 15 tons net, and Steam and Motor Vessels under 15 tons gross, are included in this table only if registered under Part I of the Merchant Shipping Act, 1894.

TABLE 7.—Statement showing the Number and Tonnage of Mercantile Vessels built for Foreigners at the undermentioned ports during the years 1924–1930. (The figures are supplied by the Board of Trade.)

Ports and Years.	Sailing Vessels.		Steam Vessels.			Motor Vessels.			Total.	
	No.	Tons Net.	No.	Tons		No.	Tons		No.	Tons Net.
				Net.	Gross.		Net.	Gross.		
Blyth—										
1924	—	—	2	1,403	2,833	—	—	—	2	1,403
1925–8	—	—	—	—	—	—	—	—	—	—
1929	—	—	1	1,532	2,662	—	—	—	1	1,532
1930	—	—	—	—	—	—	—	—	—	—
Hartlepoons—										
1924	—	—	2	3,596	5,900	—	—	—	2	3,596
1925–6	—	—	—	—	—	—	—	—	—	—
1927	—	—	2	5,502	9,203	—	—	—	2	5,502
1928	—	—	3	4,277	7,813	—	—	—	3	4,277
1929	—	—	3	4,357	7,918	—	—	—	3	4,357
1930	—	—	3	3,540	6,019	—	—	—	3	3,540
Middlesbrough—										
1924	—	—	2	150	434	—	—	—	2	150
1925	—	—	3	339	946	—	—	—	3	339
1926	—	—	2	1,253	2,449	1	5,215	8,875	3	6,468
1927	—	—	—	—	—	2	9,840	17,920	2	9,840
1928	—	—	3	326	894	3	19,113	32,544	6	19,439
1929	—	—	10	840	2,630	—	—	—	10	840
1930	—	—	13	5,013	9,397	2	17,049	28,686	15	22,062

		Newcastle and Tyne Ports—										
16733	1924	...	—	—	5	13,465	22,248	3	16,173	26,524	8	29,638
	1925	...	—	—	7	9,264	15,208	3	9,126	15,356	10	18,390
	1926	...	—	—	4	4,712	8,728	3	9,968	17,308	7	14,680
	1927	...	—	—	11	17,313	30,500	6	9,557	16,584	17	26,870
	1928	...	—	—	6	7,943	14,339	3	9,726	16,787	9	17,669
	1929	...	3	300	13	34,721	58,590	9	18,468	30,597	25	53,489
	1930	...	2	152	2	3,667	6,754	23	98,305	164,493	27	102,124
		Stockton—										
1924-7		...	—	—	—	—	—	—	—	—	—	—
	1928	...	—	—	2	3,688	6,215	—	—	—	2	3,688
	1929	...	—	—	—	—	—	—	—	—	—	—
	1930	...	—	—	1	1,543	2,569	—	—	—	1	1,543
		Sunderland—										
	1924	...	—	—	—	—	—	—	—	—	—	—
	1925	...	—	—	3	6,309	10,547	—	—	—	3	6,309
	1926	...	—	—	—	—	—	—	—	—	—	—
	1927	...	—	—	3	9,019	14,834	—	—	—	3	9,019
	1928	...	—	—	8	17,635	30,204	—	—	—	8	17,635
	1929	...	—	—	11	25,948	43,521	—	—	—	11	25,948
	1930	...	—	—	9	16,622	27,945	9	37,413	63,331	18	54,035
		Total of above—										
	1924	...	—	—	11	18,614	31,415	3	16,173	26,524	14	34,787
	1925	...	—	—	13	15,912	26,701	3	9,126	15,356	16	25,038
	1926	...	—	—	6	5,965	11,177	4	15,183	26,183	10	21,148
	1927	...	—	—	16	31,834	54,537	8	19,397	34,504	24	51,231
	1928	...	—	—	22	33,869	59,465	6	28,839	49,331	28	62,708
	1929	...	3	300	38	67,398	115,321	9	18,468	30,597	50	86,166
	1930	...	2	152	28	30,385	52,684	34	152,767	256,510	64	183,304
	Totals	...	5	452	134	203,977	351,300	67	259,953	439,005	206	464,382

Sailing Vessels under 15 tons net, and Steam and Motor Vessels under 15 tons gross, are not included in this table.

TABLE 8.—*Gross Tonnage of Merchant Vessels Launched on the Clyde, 1910–1930*
(Steam and Motor Vessels only, excluding Warships, Sailing Vessels and Barges.)
(From Lloyd's Register, Annual Summary.)

<i>Year.</i>	<i>Glasgow.</i> <i>Tonnage.</i>	<i>Greenock.</i> <i>Tonnage.</i>	<i>Clyde.</i> <i>Tonnage.</i>
1900	259,599	178,353	437,952
1901	269,977	149,446	419,423
1902	298,871	144,872	443,743
1903	226,315	115,287	341,602
1910	207,650	122,722	330,372
1911	321,308	207,301	528,609
1912	329,542	237,393	566,935
1913	403,479	269,743	673,222
1914	242,761	196,518	439,279
1915	104,953	98,870	203,823
1916	79,208	92,949	172,157
1917	185,551	134,308	319,859
1918	188,736	160,024	348,760
1919	335,450	185,877	521,327
1920	457,032	223,434	680,466
1921	357,564	146,842	504,406
1922	270,345	124,429	394,774
1923	131,114	40,380	171,494
1924	360,062	168,165	529,227
1925	330,365	175,282	505,647
1926	144,132	120,052	264,184
1927	251,830	160,268	412,098
1928	350,510	219,190	569,700
1929	340,394	189,794	530,188
1930	321,829	184,802	506,631

Four Year Averages from the above figures.

<i>Years.</i>	<i>Glasgow.</i>	<i>Greenock.</i>	<i>Clyde.</i>
1900–1903	263,690	146,989	410,680
1910–1913	315,495	209,289	524,784
1927–1930	316,141	188,513	504,654

TABLE 9.—Numbers and Tonnage of Steam and Motor Oil Tankers of 100 tons and upwards launched.
(From Lloyd's Annual Summary, and Special Information from Local Offices of Lloyd's Register.)

Port or Country.	1920.		1921.		1922.		1923.		1924.		1925.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
Tyne and Blyth	1	5,570	16	129,583	18	108,815	5	30,510	7	38,308	5	35,144
Sunderland	3	20,759	4	26,715	6	38,780	—	—	3	19,853	2	11,609
Middlesbrough and Stockton	—	—	1	5,931	1	5,800	—	—	—	—	1	8,930
Hartlepoons	—	—	—	—	—	—	—	—	—	—	—	—
N.E. Coast	4	26,329	21	162,229	25	153,395	5	30,510	10	58,161	8	55,683
The Clyde	—	—	10	44,646	6	40,030	1	6,600	3	7,898	7	46,450
Great Britain and Ireland ...	—	—	38	250,868	42	262,826	9	58,188	13	65,005	24	134,766
Denmark	—	—	2	6,242	—	—	—	—	—	—	1	8,913
France	—	—	3	22,990	4	28,280	2	12,384	1	5,500	—	—
Germany	—	—	3	7,165	1	3,227	3	22,400	—	—	10	89,731
Holland	—	—	1	1,050	2	2,544	2	4,089	7	27,683	8	31,710
Italy	—	—	4	24,512	4	16,835	3	14,180	—	—	3	15,032
Japan	—	—	3	21,058	2	12,515	—	—	1	1,640	—	—
Spain	—	—	1	4,597	—	—	—	—	—	—	—	—
Sweden	—	—	1	5,450	—	—	1	3,700	—	—	1	5,500
U.S.A.	—	—	92	690,308	2	14,440	2	9,862	9	16,197	1	1,217
Danzig	—	—	—	—	—	—	1	1,378	—	—	—	—
Russia	—	—	—	—	—	—	—	—	—	—	—	—
China	—	—	—	—	—	—	—	—	—	—	—	—
British Dominions	—	—	3	16,116	2	11,638	—	—	—	—	—	—
Norway	—	—	—	—	2	3,549	—	—	—	—	—	—
World	—	—	151	1,050,356	61	355,854	23	126,181	31	116,025	48	286,869

16793

4

289

TABLE 9.—Numbers and Tonnage of Steam and Motor Oil Tankers of 100 tons and upwards launched.
(From Lloyd's Annual Summary, and Special Information from Local Offices of Lloyd's Register.)

Port or Country.	1926.		1927.		1928.		1929.		1930.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
Tyne and Blyth	9	49,880	28	139,386	23	118,135	10	68,672	36	257,856
Sunderland	—	—	6	31,550	3	12,656	—	—	10	72,830
Middlesbrough and Stockton	2	10,921	2	10,720	4	43,169	3	22,924	6	35,140
Hartlepoons	—	—	—	—	—	—	—	—	—	—
N.E. Coast	11	60,801	36	181,656	30	173,960	13	91,596	52	365,826
The Clyde	5	33,740	13	76,825	14	103,644	6	49,117	18	132,713
Great Britain and Ireland ...	19	100,020	62	305,781	51	300,348	25	175,009	77	550,475
Denmark	1	3,000	6	44,501	12	85,544	—	—	2	13,484
France	2	17,000	1	5,600	7	53,863	3	23,668	1	7,880
Germany	5	44,792	4	35,097	2	14,109	3	26,217	9	86,977
Holland	8	48,415	4	25,227	7	41,925	4	24,554	4	23,302
Italy	2	11,604	3	10,384	3	18,417	2	7,799	2	19,070
Japan	—	—	—	—	3	22,036	2	15,942	1	7,280
Spain	—	—	—	—	—	—	—	—	1	7,641
Sweden	2	11,500	7	42,566	10	81,060	3	23,400	9	69,082
U.S.A.	2	10,166	6	37,318	3	23,505	3	12,303	13	104,674
Danzig	—	—	4	27,863	1	6,044	1	5,978	—	—
Russia	—	—	1	7,000	—	—	3	10,000	—	—
China	—	—	1	1,100	—	—	—	—	—	—
British Dominions	—	—	—	—	—	—	—	—	—	—
Norway	—	—	—	—	—	—	—	—	—	—
World	41	246,497	99	542,437	99	646,851	49	324,870	119	889,865

TABLE 10.—Tonnage of Warships launched at North East Ports, 1900–1930.

From 1900–1914 the tonnages given are “displacement” tons.

From 1920–1930 the tonnages given are gross tons.

1900, 19,040; 1901, 14,364; 1902, 10,240; 1903, 33,825; 1904, 12,120; 1905, 31,033; 1906, 17,120; 1907, 38,092; 1908, 21,830; 1909, 13,710; 1910, 28,515; 1911, 28,120; 1912, 31,520; 1913, 65,737; 1914, nil; 1920, 6,147; 1921–4, nil; 1925, 25,550; 1926, nil; 1927, 1,680; 1928, 15,300; 1929, 4,320; 1930, 11,280.

NOTES.

The figures for 1900–1914 are from Lloyd’s Register.

With the exception of those for 1901, which include 360 tons launched at Sunderland, all figures relate to Newcastle (i.e., Tyne and Blyth) production.

Annual Summaries of Shipbuilding. The figures for 1920–1930 are from the River Commissioners of the North East Coast. Apparently no warships were built at the Hartlepoons or on the Tees during the above years, though some small ships were built on the Tees and the Wear during the war years 1915–19.

A displacement ton may be taken as being equal to two, or slightly more than two, gross tons (see pp. 241–2).

TABLE 11.—Numbers and Gross Tonnage of Merchant Vessels (excluding Sailing Vessels and Barges) commenced in each Quarter
(From Lloyd's Register Quarterly and Special Returns.)

Port.	1928.				1929.				March. No. Tonnage.	No.
	March. No. Tonnage.	June. No. Tonnage.	September. No. Tonnage.	December. No. Tonnage.	March. No. Tonnage.	June. No. Tonnage.	September. No. Tonnage.	December. No. Tonnage.		
Newcastle (Incl. Blyth) ...					19 73,186	21 90,766	16 74,189	15 91,286	19 122,488	10
Sunderland ...					15 69,340	13 52,868	15 71,927	19 93,921	8 21,100	4
Middlesbrough and Stockton					10 32,407	23 16,757	9 21,771	15 38,654	11 18,933	6
Hartlepoons ...					4 16,178	4 20,335	2 9,900	5 18,860	4 14,420	—
N.E. Coast ...					48 191,111	61 180,726	42 177,787	54 242,721	42 176,941	20
The Clyde ...	22 93,767	26 112,446	18 102,205	29 151,035	45 146,030	34 123,945	28 117,363	33 127,470	30 132,898	22
Great Britain and Ireland ...	102 340,060	88 275,943	72 243,086	124 430,338	125 361,022	151 426,215	103 360,087	135 495,090	122 425,093	88
The World ...	186 598,150	186 526,644	143 486,700	203 673,487	237 657,523	266 690,575	220 667,860	275 961,788	231 834,788	193
Percentage N.E. of Great Britain and Ireland					52.9	42.4	49.4	49.0	41.6	
Percentage Clyde of Great Britain and Ireland					40.4	29.1	32.6	25.75	31.3	
Percentage Great Britain and Ireland of World					54.91	61.7	53.9	51.5	50.9	

TABLE 12.—Number and Gross Tonnage of Merchant Vessels under construction during each Quarter (excluding Sailing Vessels)
(Lloyd's Register, Quarterly Returns.)

Port.	1928.				1929.				March. No. Tonnage.	No.
	March. No. Tonnage.	June. No. Tonnage.	September. No. Tonnage.	December. No. Tonnage.	March. No. Tonnage.	June. No. Tonnage.	September. No. Tonnage.	December. No. Tonnage.		
Newcastle ...	56 246,004	42 210,753	31 160,366	33 154,912	37 178,990	43 224,933	45 224,161	45 263,128	51 324,423	48
Sunderland ...	37 162,346	26 111,863	17 65,146	25 102,091	37 157,601	37 161,181	38 175,864	39 192,028	32 149,236	23
Middlesbrough and Stockton	15 83,020	15 73,599	9 44,964	18 48,047	26 78,903	32 77,687	16 57,977	20 79,204	24 70,944	14
Hartlepoons ...	8 41,108	4 21,832	5 16,990	7 30,825	8 39,058	8 36,513	7 34,930	7 28,760	10 38,440	5
N.E. Coast ...	116 532,478	87 418,047	62 287,466	83 335,875	108 454,552	120 500,314	106 492,932	111 563,120	117 583,043	90
The Clyde ...	106 613,010	84 510,105	76 488,787	98 559,034	113 577,602	107 567,885	115 576,853	113 543,916	116 572,258	98
Great Britain and Ireland ...	302 1,435,629	254 1,196,308	220 1,086,283	262 1,241,114	321 1,355,409	354 1,450,431	332 1,485,360	342 1,553,861	354 1,612,993	302
The World ...	644 2,880,472	605 2,639,007	554 2,504,560	599 2,607,493	706 2,827,047	735 2,826,388	715 2,806,772	757 3,088,217	773 3,238,979	710
Percentage N.E. of Great Britain and Ireland					33.5	34.5	33.2	36.2	36.15	
Percentage Clyde of Great Britain and Ireland					42.6	39.2	38.8	35.0	35.5	
Percentage Great Britain and Ireland of World					47.9	51.3	52.9	50.3	49.8	

TABLE 13.—Numbers and Tonnage of Oil Tankers of 1,000 tons and upwards under construction.
(From Lloyd's Register, Quarterly Returns and Special Information from Local Offices of Lloyd's Register.)

1929.				1930.				1931.			
March. No. Tonnage.	June. No. Tonnage.	September. No. Tonnage.	December. No. Tonnage.	March. No. Tonnage.	June. No. Tonnage.	September. No. Tonnage.	December. No. Tonnage.	March. No. Tonnage.	June. No. Tonnage.	September. No. Tonnage.	
6 43,010	8 57,460	13 93,619	23 168,108	35 252,736	38 274,117	29 211,026	22 160,161	15 112,579	12 89,439	7 50,368	
— —	— —	2 18,980	7 52,666	8 59,636	9 64,236	6 39,902	2 13,680	1 6,840	1 6,826	— —	
3 33,090	3 32,985	2 25,733	7 46,505	6 37,506	2 28,674	3 45,340	2 33,400	4 37,250	2 33,400	— —	
— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	
9 76,100	11 90,445	17 138,332	37 267,279	49 349,878	49 367,027	38 296,268	26 207,241	20 156,669	15 129,665	7 50,368	
7 49,050	6 50,700	8 69,550	11 92,750	20 149,550	25 186,350	18 135,650	13 101,650	10 80,850	8 64,700	6 46,776	
20 148,480	21 171,040	27 226,412	52 397,559	77 558,778	84 633,577	69 540,318	48 388,897	37 299,513	28 243,315	16 122,408	
— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	
1 5,500	1 5,500	— —	— —	— —	— —	— —	— —	— —	— —	— —	
— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	
7 53,951	4 31,666	5 37,851	1 6,100	1 6,100	2 13,400	5 32,200	7 55,100	8 63,600	6 50,155	6 44,900	
4 35,750	2 16,200	4 33,100	3 21,602	2 14,190	1 9,200	1 9,200	— —	1 9,200	1 9,550	1 9,550	
2 13,300	4 21,700	3 15,700	8 74,445	9 84,745	16 142,845	15 128,545	16 143,250	11 104,950	9 82,090	8 81,590	
1 6,500	1 6,500	1 4,500	5 27,100	3 19,200	10 46,900	13 75,900	13 76,350	11 71,800	10 69,800	6 49,100	
2 15,780	2 15,768	— —	1 1,450	1 1,330	2 19,070	4 34,510	4 35,480	3 27,740	3 29,300	3 29,300	
5 24,000	7 35,000	6 28,000	— —	— —	1 8,900	3 25,480	3 25,480	2 18,200	1 9,300	1 1,060	
— —	— —	— —	7 35,000	9 46,000	8 47,173	— —	— —	— —	— —	— —	
3 24,400	3 24,400	5 40,600	— —	2 15,641	4 23,441	4 23,441	4 25,641	3 18,000	4 25,700	6 37,900	
2 3,800	4 11,000	2 17,800	4 35,800	7 56,950	11 89,350	12 90,550	13 100,600	14 108,600	11 85,100	14 107,450	
— —	— —	— —	4 28,700	11 73,950	9 76,200	8 67,500	6 50,000	3 27,000	2 10,500	1 9,000	
— —	— —	— —	— —	— —	— —	1 6,500	1 6,500	2 13,000	2 13,000	2 13,000	
47 331,411	49 338,774	53 403,963	85 627,756	122 886,884	148 1,110,056	135 1,034,144	115 907,298	95 761,603	77 627,810	64 505,258	

TABLE 14.—Numbers and Tonnage of Steam and Motor Oil Tankers of 1,000 tons and upwards commenced.
(From Special Information from Local Offices of Lloyd's Register of Shipping.)

1929.				1930.				1931.			
March. No. Tonnage.	June. No. Tonnage.	September. No. Tonnage.	December. No. Tonnage.	March. No. Tonnage.	June. No. Tonnage.	September. No. Tonnage.	December. No. Tonnage.	March. No. Tonnage.	June. No. Tonnage.	September. No. Tonnage.	
1 7,000	4 24,150	6 40,369	11 81,296	16 109,968	8 54,814	1 7,700	3 28,681	— —	1 4,990	— —	
— —	— —	2 18,980	5 33,686	1 7,000	2 14,000	— —	— —	— —	— —	— —	
1 8,990	— —	1 16,737	5 20,772	— —	— —	2 33,400	— —	2 3,850	— —	— —	
— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	
2 15,990	4 24,150	9 76,086	21 135,754	17 116,968	10 68,814	3 41,100	3 28,681	2 3,850	1 4,990	— —	
1 9,000	2 18,700	4 32,900	4 31,400	10 66,900	4 29,900	1 9,700	— —	— —	— —	— —	
4 26,170	8 66,230	14 118,483	27 184,854	33 225,518†	20 155,114	7 74,300	3 28,681	3 7,330	1 4,990	— —	
— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	
— —	— —	— —	53 395,737	— —	— —	— —	63 483,613	— —	— —	4 12,320 (3 Qtrs.)	

of 2,200 tons for carrying liquid asphalt.

† Includes 1 Steamer of 2,800 tons for carrying liquid asphalt.

TABLE 15.—Financial Position of Seven North East Coast Shipbuilding, Ship-repairing, and Marine Engineering Companies in 1929 and 1930.

				<i>Liabilities.</i>		
				<i>1929.</i>	<i>1930.</i>	<i>Difference.</i>
				£	£	£
Paid up Capital	...	...	...	18,311,227	18,311,227	Nil.
Debentures and Loans	...	...	...	5,229,460	5,504,723	+ 275,263
Reserves	...	...	...	3,349,392	3,526,646	+ 177,254
Sundry Creditors	...	...	...	6,595,451	7,051,295	+ 455,844
Balance Profit and Loss A/c.	...	...	...	1,146,570	1,135,847	- 10,723
				34,632,100	35,529,738	+ 897,638
				<i>Assets.</i>		
				<i>1929.</i>	<i>1930.</i>	<i>Difference.</i>
				£	£	£
Land, Buildings, Plant and Machinery.	...	...	...	5,992,785	6,198,518	+ 205,733
Investments	...	...	...	16,640,541	21,339,157	+ 4,698,616
Work in Progress	...	...	...	1,001,313	1,265,933	+ 264,620
Cash and Debtors	...	...	...	10,997,461	6,826,150	- 4,171,311
				34,632,100	35,629,758	+ 997,658
				<i>Profits.</i>		
				<i>1929.</i>	<i>1930.</i>	<i>Difference.</i>
				£	£	£
Brought Forward	...	...	...	330,824	367,015	+ 36,191
Net Profit	...	...	...	1,313,217	990,828	- 322,389
				1,644,041	1,357,843	- 286,198
Various Expenses	...	...	...	295,000	110,000	- 185,000
				1,349,053	1,247,843	- 101,210
Dividends Paid	...	...	...	1,073,551 (= 5.8 per cent.)	1,090,277 (= 5.9 per cent.)	+ 16,726
				1,644,041	1,357,843	- 286,198
Carried Forward	...	...	...	{ 265,502* } { 367,015 }	{ 157,566* } { 359,481 }	{ - 107,936* } { - 7,534 }

* The figures starred show balance as calculated from above data: those below them give totals of actual balances given in the accounts of the various companies. The difference is due to the impossibility of incorporating numerous adjustments such as paying dividends, or bearing losses, out of reserves.

VIII (a).—ORGANIC CHEMICAL INDUSTRIES IN THE NORTH EASTERN COUNTIES.

(Memorandum by Professor G. R. Clemo).

Neither in the past nor at the present time, except for Billingham, and its activities in this connection are discussed later, has any place on or near the great Northern coalfield been really engaged in the Organic Chemical Industry. It is probably self-evident, however, that in a community of about a million such as that on Tyneside there will be numerous small and mainly individualistic concerns dealing with organic materials in some form or another and these will be indicated in due course.

The main reason, in my opinion, for such a state of affairs is, that whilst this Area has produced world famous scientists and engineers such as Swan, Parson, and Armstrong, to name but a few, it has not produced in recent years an industrial chemist of the stamp and vision of the pioneers who founded and developed German chemical industry from about 1870 to the great Interessen Gemeinschaft (I.G.) of to-day.

Failing the necessary leadership then, this community has been only too glad to sell as much as ever possible of its best coal and allow others, mainly abroad (although 7-8 million tons go annually to the great London gas companies), to reap the benefit by using it to the greatest advantage.

The result of such a policy can be seen by comparing Tyneside during the past five years with a centre of the German Organic Chemical Industry whose operations are mainly based on the greatest of all organic raw materials, coal, such as Ludwigshafen during the same period.

It may be mentioned in passing in this connection that dyestuffs stood almost alone amongst this country's exports in showing an increase during the first nine months of this year.

It is useless to cry over dyes, however, since apart from a few specialities used in small amounts for the colouring of food, it is probably true that not a single one has ever been manufactured in this Area and the fact must be accepted that their production is now established in three or four centres elsewhere in this country.

It will be obvious that the coal gas industry will be on an extensive scale in such a populous area and the Newcastle and Gateshead Gas Company alone carbonised about a quarter of a million tons of coal in 1930. The resulting benzene is sold to National Benzol Ltd., and of the other products of most interest from the point of view of chemical manufacture the bulk appear to be exported as crudes. Thus, the whole of the naphthalene appears to go to the U.S.A. via Hamburg.

The Area has also several batteries of coke ovens manufacturing for use in the local blast furnaces and for export, and the production of the coke is about the only chemical aspect studied seriously in connection with the local coal industry. Here again the by-products receive little attention. In this connection, if this Area is compared with a corresponding one such as the Ruhr, one is struck by the fact that in the latter case the coal problems actually under investigation at present are of a far wider and more basic character than anything which is being done in this Area.

During recent years the Newcastle Electric Supply Co. has been operating a low-temperature carbonisation plant at Dunston, and although it is not working at present, the method may yet prove of vast importance to this Area. Whilst the method has

failed to fulfil expectations so far, valuable data have been collected and indeed at the moment a claim has been made that all difficulties have been solved and the future success of the process assured.

Of the numerous miscellaneous and mainly individualistic concerns of an organic chemical nature, Newcastle itself has an extensive old-established pharmaceutical business which largely meets the needs of the Area, a tannery, a brewery, and several paint works, some of which deal in a limited way with the post-war development of organic varnishes, importing, be it said, the essentials. In addition there are round and about a few small oil refineries, some sweet factories, a firm supplying antiseptics, a paper mill, and two soap works. One of the latter has passed to American control in recent years, and it is not without significance that it is almost alone amongst Tyneside industries in having since recruited three of our graduate chemists.

Finally, North Shields has a very considerable industry in fish by-products, including fish meal and guano factories. The great bulk of the oil appears to be sold as crudes, and it seems that only about 0.2 per cent. of the cod liver oil will be worked up for medicinal purposes this year. Further, almost the whole of the fish meal and guano—both rich in organic materials—are exported to Germany. In the latter country; or in the U.S.A., such an industry would have a staff of highly-skilled research chemists, and probably Fellows, such as those at the Mellon Institute, working on its basic problems.

So far no mention has been made of this country's greatest post-war development in chemical industry, viz., the I.C.I. works at Billingham. Its first big achievement was the nitrogen fixation process for fertiliser purposes, but of recent years it has developed the manufacture of certain organic compounds from coal.

Some four or five years ago I was privileged to address the Newcastle Chamber of Commerce, and whilst deploring the past record of Tyneside in the scientific use of coal, I indicated probable and desirable developments during the coming decade. These included the production of acetic acid and acetone (about £80 a ton at the time), both necessary for the then-developing artificial silk industry. Further, if Newcastle made acetic acid (imported, be it noted, for the extensive manufacture of white lead), its proximity to the Norwegian pulp source would seem to mark Tyneside as a suitable centre for artificial silk manufacture. Other possibilities were the synthesis of methyl-alcohol and thence of formaldehyde and above all the production of a liquid fuel from coal. Except for the latter, almost all of these and others have since reached commercial production on a large scale at Billingham. The coal to oil question is in a particularly

interesting phase at the present time. Thus, whilst the Empire production of mineral oil appears to be about 3 million tons, its consumption as long ago as 1927 was 11 million tons. Last year this country imported no less than 2,400 million gallons of mineral oil. The average yearly increase during the past decade has been some 200 million gallons, and imported oil probably forms one of the biggest single items in our present-day adverse trade balance. It is unnecessary to deal at greater length with the general aspects of the fuel problem since it was discussed fully by those most competent to do so at the recent British Association meeting, Section B.

The pioneering work on the coal-oil conversion was done by Bergius as long ago as 1910-1911, and, backed by Dr. Bosch of the I.G., the process was patented here in 1914, and reached the stage of commercial production from brown coal in Germany some years ago. Now, after intensive research and small-scale works experiments, the chemists and engineers at Billingham have so perfected the process for bituminous coal that a 60 per cent. yield of a good petrol together with valuable by-products can be obtained when working on a 60-100 ton scale a day. The economic unit, costing £8 million to construct, would deal with 1,000 tons of coal a day and produce about 200 million gallons of oil a year, i.e., our annual increase of imported oil during the past 10 years. The process would allow of the petrol being sold at a profit at 7d. a gallon at present, and thus enable this fuel to compete for use in this country with the corresponding duty-bearing imported article.

So much for the past and present. What of the future? Prophecy is usually wrong, but all the same it is as certain as can be that if we are to retain a standard of living even approximating to the present we shall have to make from now onwards the utmost of our own raw materials and, foremost of all, of coal. It is possible and, indeed, desirable, but for the effect on the employment of the coal mining population, that coal should become less and less important as a power producer and used essentially as a chemical. Thus our coal reserves are calculated at present rates of consumption to last less than half as long as those of Germany and a quarter as long as those of the U.S.A.

As already mentioned, the low-temperature distillation process may yet prove a success and incidentally free us from smoke-darkened cities, but apart altogether from the present phase of the coal-oil question, the chemist has many other ideas for the use of coal. No point would be gained by enumerating them, but the history of the past 100 years shows that the laboratory experiment of to-day often becomes the great industry of to-morrow. The one essential condition involved, however, is that a broad and enlightened scientific leadership shall be backed by an adequate

team of highly-trained researchers. One has only to call to mind some of the recent great developments, in, say, the U.S.A., for full proof of this proposition.

Will the North Eastern Area learn the lesson of its past failures in chemical industry?

VIII (b).—THE PROSPECTS OF THE CHEMICAL INDUSTRY ON TYNESIDE.

(*Memorandum by Professor H. V. A. Briscoe.*)

In former times Tyneside was an important centre for heavy chemical industry, exemplified by the Leblanc soda process, the production of caustic soda, chlorine and hydrogen electrolytically on a large scale, the Castner Kellner process for producing sodium and potassium for cyanide manufacture, and the manufacture of bleaching powder and cement. Recently such manufactures have ceased, very largely if not wholly as a result of "rationalization," whereby they have been taken over by Imperial Chemical Industries and transferred bodily to Billingham and other centres. There exists, I believe, no peculiar natural advantage in Tyneside for such industries, so though it is no less advantageous than many other places, it is probable that these industries have gone for good.

There is, of course, some difficulty in defining "chemical industry" and it is customary to exclude from that term many industries, such as the manufacture of leather, glass, paint and beer, which depend primarily on chemical reactions and can only be pursued effectively under strict scientific control. Among definitely "chemical" industries which remain on Tyneside, however, there are, to my knowledge, the following:—

1. Lead smelting and recovery, with the accompanying concentration of silver in residues and the manufacture of white lead, red lead, litharge, and other lead products (Associated Lead Manufacturers).
2. Manufacture of solder and white metals (Tyne Solder Co.).
3. Extraction of copper from spent and raw pyrites by the wet process (Tharsis Copper Co., and Bede Metal Co.).
4. Production of antimony oxide and antimony sulphide (as pigments chiefly) by Cooksons.
5. The preparation of alumina from bauxite.
6. Manufacture of sulphuric acid and precipitated barium sulphate (Blaydon Manure and Alkali Co.).
7. Production of high-class zinc oxide pigment by burning spelter (Felling Zinc Oxide Co. and Newcastle-on-Tyne Zinc Oxide Co.).
8. Production of magnesia and derivatives (Washington Chemical Co.).
9. Production of ammonium sulphate, benzol and phenols, cresols, etc., in by-product coking plants and in gas works.
10. Tar distillation.
11. Soap manufacture.
12. Manufacture of chemical manures (Langdale's Chemical Manure Co., Ltd., The Northern Fertilizers, Ltd., Langdale Brothers, Henry Bell & Sons, Ltd.).

Of these, several depend upon natural facilities. Ready transport by sea and easy handling of bauxite, pyrites, etc., certainly influence the retention of 1, 2, 3, 4 and 5. Natural resources, of witherite (barium carbonate, of which the chief known source in the world is at Fourstones, near Hexham though a further considerable deposit has been discovered recently in a local coal mine) and of magnesia, created and should maintain 6 and 8. But while 9 is dependent on the local occurrence of good coking coals, ammonium sulphate can now be produced more cheaply by synthetic methods at Billingham, where there is in gypsum a cheap source of sulphur. The market prices of phenols are so low that their recovery is a doubtful proposition, and in by-product coking plants the only really profitable by-product for the moment is benzol.

It is extremely difficult to see into the future with regard to chemical industries here—largely because except where they depend upon locally available raw materials such as coal, clay and witherite, their establishment and continuance in this locality is principally determined by the commercial and technical enterprise of individuals. In any case where there is no great inherent disadvantage in working small units, for example in the initial stages of any new development, a manufacture may be as conveniently and efficiently carried on here as anywhere. Therefore if, for example, it became known that any inventor or discoverer could count upon obtaining in Newcastle much more intelligent consideration, greater facilities for development and more ready financial support for a good idea than elsewhere, this would, even in a limited period of, say, 10 years or so, do much more than any natural advantage toward securing the establishment here of important new industries. Or, considering another aspect of the same idea, co-operative research by the coal-owners and coke-makers upon, say, resins and plastics generally, or upon synthetic solvents might, at a relatively insignificant cost of, perhaps, £50,000-£100,000 establish here, in a similar limited time, a big industry in these and other coal by-products. An example of the importance of individual enterprise in determining the location of new industries is seen in the case of the Newcastle Zinc Oxide Co., Ltd. Though it is true that an old munitions factory afforded excellent accommodation at a low cost, there is, so far as I can see, no real reason why this manufacture should have been established here rather than elsewhere, except that a Newcastle man happened to have the vision and enterprise to establish it.

The pre-eminence of Britain and the place of Tyneside in industry in the last hundred years was due to the exploitation of mechanical invention, in which we then led. Though mechanical invention continues, it is now equally shared by other nations and localities and offers no advantage to us. The corresponding asset to-day is *scientific* invention and discovery; the application of known scientific facts in industry, and especially the discovery of *new* facts and

principles and their application. Tyneside, and for that matter Britain as a whole, can only recover her former prosperity relative to other nations by a determined and persistent effort to draw ahead and stay ahead in discovery and invention and in their exploitation and development by the most progressive, original and efficient organisation and methods.

In my opinion, the chief hindrance lies in the fact that, in general, the directors and executive officials responsible for the policy and organisation of industry are not able to understand or appreciate scientific matters and methods, whether in technical manufacture or commercial operations. They do, in general, take care to know the details of the actual methods and operations at present involved in their business, but because they do not really know or understand the basic scientific principles which underlie their operations, business men in general, when confronted with possible developments, do not know enough either to seize the good or reject the bad.

We cannot afford to await the growth of a generation of business men who are fitted to direct the policy of a scientific industry, even were there any sign that this was occurring. The only method which may save us is for the business men to depute their task of consideration and decision in *technical* matters to scientific experts who are also sound business men, though not necessarily having previous knowledge of the particular business. Such men are few, but they exist, and by using them in small groups to deal with the major problems of many firms, themselves grouped probably by industries, fairly rapid progress could be made.

IX.—THE PRINTING AND ALLIED TRADES.

(*Memorandum by Mr. J. Parker.*)

(i) Introduction.

The Printing and Paper Trades present difficulties to the investigator out of all proportion to their size and importance in the general industrial fabric of the North East. Although employing only 0.9 per cent. of the total numbers engaged in the industries of the North Eastern Area, they embrace roughly about 300 firms or establishments, the size and equipment of which varies from the one-man village printer's business with its comparatively crude presses and hand-composing appliances, to the firm employing between three and four hundred workers and using the most up-to-date methods and machinery. Moreover, the trades are concerned in the production of a multiplicity of products ranging from the simple chemist's label to the elaborate daily newspaper or illustrated magazine.

These circumstances, implicit in the structure of the trades, and the nature of the production with which they are concerned, it will be readily understood, make very difficult the collection and classification of data upon which definite conclusions may be based.

Unfortunately this difficulty has been accentuated in the present enquiry by the unwillingness or inability of many businesses to supply statistical information concerning their operations over a definite period, or to give more than a vague and general estimate of their future prospects.

In consequence, the report submitted below falls far short of that comprehensiveness, that definiteness which it is felt the results of such an enquiry as we have been conducting should produce.

(ii) The Present Condition of the Trades.

Trade Directories show that there are roughly 300 businesses concerned in the printing, bookbinding, paper-making and cardboard box manufacturing trades in the Area. Most of these, however, are comparatively small establishments, employing less than 20 persons. The following figures indicate this quite clearly. According to statistics supplied by the Ministry of Labour there were 8,804 insured persons employed in the trades in July, 1930. These were distributed as follows:—

Printing, Publishing, and Bookbinding	6,939
Cardboard Box, Paper-Bag, Wallpaper, and Stationery Manufacture.	347
Paper and Paperboard Making	1,518
Total	8,804

Of this total, 4,912 persons were employed by 54 firms which leaves but 3,892 to be accounted for by the remaining 246 businesses. Put another way, it may be said that 18 per cent. of the total number of firms in the Area employed more than half the total persons at work in the trades in July, 1930.

Unfortunately, there are not any comprehensive data available regarding the equipment of the various firms. Nor is it possible to present any reliable figures regarding the volume and value of the products dealt with over a period of years. In the last 10 or 12 years, we are assured, considerable changes have taken place in the technique of the trades. In the printing trades particularly there has been a progressive introduction of new machinery and methods. Self-feeding presses, capable of much more speedy and efficient work, have tended to displace the comparatively slow-moving hand-fed machines. Motor-driven and treble-cut guillotines have in a great many establishments superseded the older and less efficient appliances; while machine composing has become a dominating feature of the shops of most go-ahead printers of the Area. A prominent master-printer states definitely that a great many firms have installed machines that they have not the slightest prospect of keeping fully employed. Even relatively small shops, he affirms, have installed monotype composing machines. In other branches of the trade similar developments appear to have been

taking place. In Bookbinding and Paper Box Making new folding, ruling, stitching, and perforating machines have tended to displace hand labour and the less efficient instruments.

Endeavours to give definiteness to these considerations were made by sending out a questionnaire to about 120 firms in the Area. One of the questions to which answers were invited concerned the introduction since 1924 of new and up-to-date machinery. Unfortunately, only 28 forms were returned, and of these, five neglected the question regarding new equipment. Of the remaining 23, 17 had, during the last six years or so, introduced new and improved machinery. Though incomplete, this information lends a measure of substantiation to the general conclusions submitted above; for the firms that sent replies included enough small and large businesses to permit one to assume that the conditions of this group are typical of the general conditions of the trades. Fortified by the statements of reliable men actually engaged in the trades, it enables us to accept the conclusions regarding the condition of these industries of the Area in the matter of equipment with some degree of safety and assurance.

Our enquiries regarding the nature, volume and value of the goods produced in recent years by these industries in the North Eastern Area have provided unsatisfactory results. There is very little statistical material that may be consulted, and attempts to compile it have been fruitless.

Talks with business men connected with the trades have revealed that many new developments in the class of product have taken place recently. Our attention was drawn to a new departure in lithographic printing. A new process called offset lithography is being adopted. The new process, we are told, consists in transferring the print from the stone to a rubber sheet and thence to paper. The new method greatly improves the work, and, while it entails no change in labour equipment, it gives quicker production at a reduced cost, which is calculated to stimulate demand. Other changes worthy of note are the development of half-tone illustration, and the increased demand for printed office equipment which the new commercial and industrial methods have occasioned. Against this is to be set the disposition recently manifested by drapers and retail traders to advertise through the newspapers rather than by means of leaflets, illustrated catalogues, etc., and the effect that the adoption of loose-leaf ledgers and other books has had upon bookbinders. Our attention has also been drawn to the work in scientific costing that has been done by the Master Printers' Federation. The Federation introduced a staff of scientific cost accountants in 1913 with a view to assisting its members. The project was held up during the War; but from 1919 onwards printers have availed themselves of its facilities and the staff has been kept busy.

The only figures available which throw any light upon the volume of business done by the trades in any recent year are those contained

in the Annual Statement of Trade for the year 1929. These show that in that year the imports of paper, cardboard and paper-making materials at ports within the Area amounted to 96,776 tons, with a value of £808,730, while exports (in the main coastwise) amounted to 5,725 tons. In isolation these figures do not, of course, give anything like a satisfactory idea of the general volume of materials with which the trades are concerned. To make even that part of the general picture complete we should need to add figures showing the quantity of materials brought into the Area by rail and road transport. These figures are not available.

Competition among printers in the Area is, we are assured, very keen. Enquiries everywhere elicited evidence of the keen struggle for business. Trade journals complain repeatedly of price cutting and other unfair methods of competition. It is stated in one quarter that in many instances the costing facilities afforded by the Master Printers' Federation, after their assistance had been sought and the results secured, have been rendered nugatory by the exigencies of competitive business. The trade is not troubled by foreign competition. Nor is the competition within the Area of firms outside the Area very important. There are instances of outside firms establishing connections in the Area and evidence of others sending travellers in to try to secure connections; but such competitive operations are negligible compared with the competition among inside firms.

In the Paper Making Trade competition is also very keen. The mills in the Area are subject to very strong foreign competition. In the production of the common types of printing paper and wrapping paper the chief competitors appear to be Norway, Sweden, and Finland. These countries, we were informed, are able to quote prices £2 10s. per ton cheaper than the local mills. In the production of the better types of paper there is also foreign competition to be met. At the mills there are strong complaints about outside competition, and pleas for the protection of a tariff are frequently heard. In addition, of course, there is competition among local firms and with those in other parts of the country; but less is heard of this than of that which emanates from other countries.

(iii) Employment and Unemployment (1923-1930).

Ministry of Labour figures show that there were 7,570 insured persons associated with the trades in 1923. The following table sets out their trade and sex distribution:—

TABLE 1.—1923.

<i>Trade.</i>	<i>Men.</i>	<i>Boys.</i>	<i>Women.</i>	<i>Girls.</i>	<i>Total.</i>
Printing, Publishing, and Bookbinding	2,830	330	1,710	390	5,260
Paper and Paperboard Making ...	1,290	100	420	100	1,910
Cardboard Box, Paper Bag, Wallpaper, and Stationery Manufacture.	170	20	170	40	400
Totals	4,290	450	2,300	530	7,570

A glance at the above table reveals that the first group of trades, Printing, Publishing, and Bookbinding, claimed in 1923 the greater share of the total insured workpeople. They accounted, indeed, for over two-thirds of the number, while the third group claimed only 400 out of a total of 7,570. The sex distribution, it will be noted, varies with each group. In the first group men hold the dominating position. They number 62.4 per cent. of the total number of insured adults. On the other hand there are about 8 per cent. more girls than boys. In the second group the number of boys and girls is the same; while there are roughly three times as many men as there are women. In group three there is the same number of men and women; but the number of girls is twice that of the boys. The position when the whole of the trades are taken together is that there are about twice as many men as there are women, the actual percentage of men is 65; while the number of girls exceeds that of boys by about 8 per cent.

In 1930 the number of insured persons had increased to 9,830, distributed as follows:—

TABLE 2.—1930.

<i>Trade.</i>	<i>Men.</i>	<i>Boys.</i>	<i>Women.</i>	<i>Girls.</i>	<i>Total.</i>
Printing, Publishing, and Bookbinding	4,530	420	2,130	520	7,600
Paper and Paperboard Making ...	1,250	60	360	130	1,800
Cardboard Box, Paper Bag, Wallpaper, and Stationery Manufacture.	120	10	240	60	430
Totals ...	5,900	490	2,730	710	9,830

These figures register an increase of 2,260 persons as compared with 1923. Over the period 1923-30 the increase has been well sustained. Every year for which figures are available shows a rise except the year 1927 when there is a temporary but very slight setback. But it is interesting to note that the greater part of the increase over the whole period is due to an unusually large rise in the year 1929. The figure in that year was 9,030, and marked an increase of 1,290 over the figure for 1927, and of 1,460 over that for 1923. This increase cannot be accounted for by reference to the ordinary methods of recruiting skilled labour for the trades in the Area. Such a rise could only appear as a consequence of an influx of skilled workers from outside, or a recruitment of unskilled or semi-skilled workers from other trades.

As to the basic causes of the increase, there seems to have been a number of factors at work. First is to be noted the fact that in the year 1929 there was a general improvement in trade. For a time it was believed that 1929 was to mark a complete recovery from the depression that had afflicted trade and industry for a number of preceding years. In this trade revival, temporary as it proved, the printing and paper trades would without doubt experience their share in the general improvement. Secondly must be mentioned the fact that in 1929 a new evening paper was established in

Newcastle. This new firm we find exchanging 601 Unemployment Insurance books in that year. A third factor which appears to have contributed to the increase is that another comparatively new firm concerned in the manufacture of wallpaper had apparently such an access of business in 1929 as to enable it to more than double its staff. In 1928 the firm exchanged 103 books in bulk; in 1929 the number exchanged was 209. There may have been other contingent forces at work assisting the abnormal rise in the figure of 1929; but there seems little reason to doubt that here we have the most important factors. The soundness of this conclusion is clearly demonstrated by the following table:—

TABLE 3.—*Insured Persons in Years 1927 and 1929.*

<i>Trade.</i>	<i>1927.</i>	<i>1929.</i>	<i>Increase.</i>
Printing, Publishing, and Bookbinding ...	5,720	6,760	1,040
Paper and Paperboard Making	1,750	1,800	50
Cardboard Box, Paper Bag, Wallpaper, and Stationery Manufacture.	270	470	200
Total Increase ... ..	...	...	1,290

The importance of the commencement of the new evening paper and of the improvement in the business of the wallpaper firm is here clearly indicated; for the sections containing the Publishing and Wallpaper trades are seen to have accounted for practically the whole of the increase.

Upon turning to the question of sex distribution for the year 1930 some interesting changes are to be observed. In 1923 we discovered that in group 1 men accounted for 62.4 per cent. of the total adults; while there were some 8 per cent. more girls than boys. In 1930, it will be noted, the proportion of men has increased to 68 per cent.; while in the juvenile section there are 10 per cent. more girls than boys; an increase in female predominance of 2 per cent. In 1930 the changes in group 2 are just as significant. Here the number of boys has decreased by 40 per cent., and the number of girls increased by 30 per cent. In the case of adults the proportion of men has increased. In 1923 the men were three times as numerous as the women. In 1930 they are $3\frac{1}{2}$ times as numerous. In the case of group 3 the changes are very striking. In 1923, it was observed there were the same numbers of men and women, but the number of girls was twice that of boys. In 1930 the number of women is double that of the men; while that of the girls is six times as great as that of the boys. The general situation is to be summarised by saying that in the case of the Printing, Publishing, and Bookbinding trades the proportion of males has increased. In the case of the Paper Making trades the proportion of adult males has increased but that of boys has decreased; while in group 3, Cardboard Box, Paper Bag, and Wallpaper trades there has been a decided progress in the number of females compared with males in both sections.

Examination of the employment figures for the same period shows that over the whole of the trades there has been a well sustained improvement. In 1923 the total number of employed was 6,874; with trade and sex distribution as follows:—

TABLE 4.—1923.

<i>Trade.</i>	<i>Men.</i>	<i>Boys.</i>	<i>Women.</i>	<i>Girls.</i>	<i>Total.</i>
Printing, Publishing, and Bookbinding	2,598	319	1,608	376	4,901
Paper and Paperboard Making ...	1,068	94	340	91	1,593
Cardboard Box, Paper Bag, Wallpaper, and Stationery Manufacture.	157	20	158	35	370
Totals	3,823	433	2,106	502	6,864

Each intervening year for which we have data shows an increase, the most significant improvement being in the year 1929, when as we have seen trade improved and a new newspaper was started. The figures setting out the increase in the number of persons employed in each of the trade groups from 1927 to 1929 show that the same influences were at work as were noted in our consideration of the abnormal increase in the number of insured persons between the same two years. They are, indeed, another indication that the conclusions arrived at there were sound and indubitable. The table below reveals that the great proportion of the increase took place in the groups containing the Publishing and Wallpaper trades.

TABLE 5.—Employed Persons in Years 1927 and 1929.

<i>Trade.</i>	<i>1927.</i>	<i>1929.</i>	<i>Increase.</i>
Printing, Publishing, and Bookbinding ...	5,353	6,445	1,092
Paper and Paperboard Making	1,554	1,707	153
Cardboard Box, Paper Bag, Wallpaper, and Stationery Manufacture.	245	443	198
Totals	7,152	8,595	1,443

The total number employed in the year 1930 was 8,804, an increase of 1,930 over the 1923 figure. They were distributed as follows:—

TABLE 6.—1930.

<i>Trade.</i>	<i>Men.</i>	<i>Boys.</i>	<i>Women.</i>	<i>Girls.</i>	<i>Total.</i>
Printing, Publishing, and Bookbinding	4,153	398	1,895	493	6,939
Paper and Paperboard Making ...	1,049	57	288	124	1,518
Cardboard Box, Paper Bag, Wallpaper, and Stationery Manufacture.	100	5	191	51	347
Totals	5,302	460	2,374	668	8,804

Over the whole period only the first group of trades, Printing, Publishing, and Bookbinding, showed an increase in the number employed. In 1930 these trades employed 6,939 persons, an increase of 2,038 over the 1923 figure. The other two groups showed a decline. In the Paper Making trades the number

employed in 1930 was 1,518, a figure which is 85 less than the number employed in 1923; while in the third group, Cardboard Box Manufacture, etc., the number declined from 370 in 1923 to 347 in 1930.

Certain important changes of sex distribution are to be noted over the period 1923-1930. The number of males employed in 1923 in group 1, Printing, Publishing, and Bookbinding, was 2,598 representing 61.7 per cent. of the total employed adults. In the youthful section the females were most numerous, accounting for 54.1 per cent. of the total employed. In the year 1930 the percentage of adult males has increased to 68.6 per cent.; while there is a slight female increase in the younger section to 55.3 per cent. In the case of group 2 the number of adult males employed in 1923 was 1,068, representing 75.8 per cent. of the total number of adults employed. In the younger category the boys held a slight advantage with 50.8 per cent. of the total number employed. The year 1930 reveals that the proportion of female adults had decreased. The number of males employed was 1,049, which amounted to 82.1 per cent. of the total adults employed, and constituted an increase of 6.3 per cent. over the figure for 1923. In the case of the younger people a complete reversal of the 1923 position has taken place. The 1923 figures show that the number of boys was slightly greater than that of the girls, whereas in 1930 the girls boast the greater proportion, having 68.5 per cent. of the total number employed. In the third group of trades the numbers of men and women were in 1923 practically equal—157 men and 158 women; while the girls predominate in the younger section, having 63.6 per cent. of the total younger people employed. The proportion of adult females has increased in 1930. They number 191, which constitutes 65.6 per cent. of the total number of adults employed. In the younger category the change is still more pronounced. Here the number of girls had increased from 63.6 per cent. to 91 per cent. of the sum of younger folk employed. In summing up the changes over the period, it may be said that only in two sections of the whole of the trades was there an increase in the proportion of males employed. In group 1 the proportion of men to women increased by roughly 7 per cent. In group 2 a similar increase amounting to 6.3 per cent. is to be observed. In all other cases it is the proportion of females that has made the progress. In group 1 there is in 1930 a slightly larger proportion of girls in the younger section, 1.2 per cent. being the measurement of the increase. In the second group the proportion of girls in the total young people employed has increased from 49.1 per cent. in 1923 to 68.5 per cent. in 1930. In the case of the third group the proportion of women in the adult section has increased from equality in 1923 to 65.6 per cent. in 1930, while the proportion of girls in the other section has increased from 63.6 per cent. to 91 per cent. over the same period.

Changes in the age distribution of the persons employed during the period are not very noteworthy. In the first of the three groups of trades the change only amounts to 1.4 per cent. Adults in 1923 accounted for 85.8 per cent. of the total number employed; while in 1930 the percentage has increased to 87.2. In the second group the change is even less significant, amounting to a decline in the proportion of adults of 0.3 per cent. In 1923 the proportion was 88.3 per cent., in 1930 it was 88 per cent. The third group manifests a change that is not very much more important. Adults accounted in 1923 for 85.1 per cent. of the whole of the persons employed. In 1930 there has been a decline to 83.8 per cent. Over the whole field there is nothing like a tendency for adult labour to be superseded by the labour of juveniles. In the first of the three groups the tendency is in the other direction; while in the other two the percentage increase in the proportion of younger people employed is so small as to be negligible.

Examination of the unemployment figures shows that there was in 1930 an increase of 320 as compared with 1923. In the intervening period the figures have varied irregularly. The following table gives the details for the years 1923 and 1930 and some intervening years.

TABLE 7.—Numbers Unemployed with Sex Distribution.

Year.	Men.	Per	Boys.	Per	Women.	Per	Girls.	Per	Total.
		cent. of Men.		cent. of Boys.		cent. of Insured Women.		cent. of Insured Girls.	
1923 ...	467	10.8	17	3.7	194	8.4	28	5.2	706
1924 ...	561	12.5	16	3.6	190	7.9	29	5.9	796
1927 ...	398	8.9	8	2.2	147	6.2	35	6.2	588
1929 ...	274	5.1	10	2.2	137	5.1	14	2.2	435
1930 ...	598	10.1	30	6.1	356	13.0	42	5.9	1,026

As might have been anticipated after our considerations connected with the growth in the numbers of insured and employed persons, the year 1929 shows the lowest number of unemployed. This comparatively low figure adds a final substantiation to the conclusions then drawn. In every respect the year 1929 stands out clearly as the best year of the period. It was patently a time when the general condition of the trades was considerably improved. The improvement, however, was only temporary. The following year reveals a position a great deal worse than it had ever been over the whole period. Such a retrogressive development is only to be explained by reference to the general slump in trade and industry which began in 1930.

There are not complete figures available permitting a comparison to be made between the unemployed position in the Area with that of the whole country. The table below, however, enables a comparison to be made so far as two of our three standard groups are concerned.

TABLE 8.—*Unemployed Percentages of the Area compared with those for Great Britain and Northern Ireland.*

Year.	Printing, Publishing, and Bookbinding.		Paper and Paperboard Making.	
	N.E. Area.	Gt. Britain and Northern Ireland.	N.E. Area.	Gt. Britain and Northern Ireland.
1923, June ...	6·8	5·7	16·5	7·0
1924 „	5·8	5·2	23·5	7·3
1927 „ ...	6·4	4·6	11·2	7·0
1929 „ ...	4·6	3·9	5·1	4·1
1930 „ ...	8·6	5·9	15·7	9·1

From this it will be seen that the position of the Area over the period is worse than that of the whole country for both groups. In the case of group 2 the comparison is very unfavourable to the North East. For 1923 the percentage of unemployed is over twice as high as that for the whole country. In the following year it is over three times as high. The years 1927, 1929, and 1930 show an improvement in the relative position of the Area, the year 1929 indicating a close approximation towards equality. The disparity between the figures in group 1 is not nearly so large; but it is sufficient to occasion grave concern.

(iv) Prospects of the Trades.

The future of the trades in the North Eastern Area is, first of all, dependent upon developments in the general conditions of trade and industry. In the last few years the Area has been suffering very acutely in the general depression of trade. The North East is predominantly concerned in the production of coal, iron and steel, and in engineering and shipbuilding. Its industries are largely heavy industries, and these have been hardest hit by the slump that has deepened almost without remission ever since the break in prices in 1920. In this depressed condition of things the Printing and Paper trades have suffered. In times of good trade the amount of printed matter required, not only by industrial and commercial concerns, but by the general public, is increased. When times are bad the quantity required falls off considerably. It is true that these trades are always less hardly hit than other trades in times of depression. Even bankruptcies necessitate printing, and there are many forms of printing which must go on whatever the general conditions of trade may be. But the fact remains that the volume of business in the Printing and Paper trades is greatly affected by the general trade conditions, and it is not to be doubted that if the next year or so should reveal a general revival of trade the position of these trades will be materially improved.

The question regarding the possibilities of such a revival is, at the moment, being widely discussed. There are many people who believe that the happenings of the past few months, the abandonment of the gold standard, and the establishment of conditions of confidence in business circles, are likely to effect a decided improvement. There are others who, afflicted maybe with recollections of the optimisms of past years that were not fulfilled, aver that there is not any immediate possibility of a general trade boom. The relative soundness of these opposing views cannot be discussed here. We can only reiterate that any general improvement of trade conditions will have salutary effects upon the trades with which we are primarily concerned.

Failing such a revival there can be little hope of any appreciable reduction in the number of unemployed associated with the trades. We have noted that there has been a decided tendency in the trades towards the introduction of new and more efficient machinery and technique. That this tendency is likely to be maintained, it seems fairly safe to anticipate. Despite the progress of the past few years in this respect, there is yet room for improvement. It may, moreover, be expected that such competition as we are assured exists in the trades in the Area will strengthen the tendency. For one consequence of strong competition is to speed up the introduction of new labour-saving, cost-reducing appliances, which will almost certainly serve to render the unemployment problem more acute. The displacement of labour occasioned by such technical changes may only be temporary. The reduced costs may stimulate demand, and give a fillip to the trade which permits of the reabsorption of the workers concerned. It is difficult, however, to say whether the reabsorption is likely to be complete, or how long a time is likely to elapse before the process has been effected. In the meantime the displaced workers have added to the difficulties of the unemployment problem. In the case of the Paper Making trade there are likely to be changes in the near future which will most probably reduce the number of people employed. Enquiries elicited the information, which has since been corroborated by a statement in the "British and Colonial Printer and Stationer," that a scheme is being prepared for the rationalization of the esparto paper trade. The scheme is sponsored by a number of prominent men in the trade, and is designed to deal with prevalent over-production, and to effect a reduction of costs by allocating orders for particular grades of work to mills in sufficient volume to enable them to run at full capacity. The scheme, the journal referred to admits, may involve the closing down of certain mills, and the throwing of many people out of work. A person directly connected with one of the esparto mills in the Area stated quite definitely that it *would* result in such a displacement of labour.

Against these considerations which suggest that, failing a general trade revival, the present abnormal number of unemployed in the

trades is likely to increase, there is no evidence of real or possible counteracting developments. It is unlikely that another newspaper of any consequence will be established in the near future. So far as we can ascertain there is no immediate likelihood of a new departure in printing or bookbinding important enough to inspire one with the belief that there is to be a progressive reduction in the number of unemployed. In the Paper Making trade there does not seem to be any immediate possibility of new mills being commenced. Most of the mills in the Area are either working short time or have part of their plant standing idle. Yet there are responsible people who maintain that the trade is over-producing. In 1929 it looked as if there were possibilities in wallpaper making. That year there was a firm in the Area which more than doubled its staff. But by 1931 the position had greatly changed. The firm which employed 239 persons in 1929 was then only employing 61.

On surveying the whole field it seems impossible to escape the conclusion that without a change for the better in the general conditions of trade and industry the number unemployed at present in these trades in the Area is not likely to be very greatly reduced. On the contrary, the indications are that the number will tend to increase.

Such a report as this would be incomplete without some attempt to estimate the number of insured persons in the trades that may, whatever the general conditions of trade, be deemed redundant. It has been decided that a trade revival of a comprehensive character would effect a reduction in the present abnormally high numbers of unemployed; but it would be too much to expect that it would completely obviate the unemployed difficulty. The figures presented above showed that even in 1929, a year in which exceptional developments greatly improved the condition of the trades, there were yet 435 persons out of work. In view of this it appears safe to conclude that a general revival of trade would not materially reduce this figure. Indeed, everything considered, a figure between 500 and 600 seems to indicate the number of persons for whom the trades in any case are not likely to find places. This, it will be observed, is estimating that the assumed trade revival will absorb about 500 of those registered as unemployed in 1930, together with those who are likely to be displaced in the future by the adoption of new appliances and methods—an estimate which, if it errs at all, does so on the side of optimism. This estimated surplus of, say, roughly 550 persons associated with the trades needs to be discounted a little in view of the fact that in normal times there are a number of people concerned in the printing trades who are itinerant jobbers, "regular casuals" they have been called. They are workers who are available for transfer from one place to another where a sudden access of business necessitates immediate increase of staff. This group of persons may not properly be termed redundant. They are a

floating reserve necessitated by the varying trade conditions of particular firms or groups of firms. Their numbers, however, would scarcely amount to more than 20 per cent. of the total unemployed, which leaves us with an estimated redundancy of roughly 450.

It is impossible to give any definite occupational classification to these redundants. The statements of certain prominent printers in the Area would lead one to conclude that they were all unskilled or semi-skilled workers. In many instances it was contended that the ratio of apprentices to journeymen, which the trade unions insist upon maintaining, is too small to permit the recruitment of a sufficient number of skilled men for the trades. But this view, as discovered, was not generally held even among employers; while it was categorically denied by the unions. It is difficult to decide between these varying opinions without some definite statistical data, but we should be greatly surprised to discover that among the redundants with which we have decided the trades are burdened there was not an appreciable proportion of skilled workers.

X.—THE FOOD, DRINK AND TOBACCO INDUSTRIES.

(Memorandum by Miss C. Braithwaite and Mr. E. Allen.)

(i) Introduction.

At first sight these industries display a range of product and a variety of activity baffling in the extreme. Comprehensive treatment would seem to be completely balked. They have, however, one common link; it is the satisfaction of the consumers' more staple, more ordinary needs, and the titillation of his palate. For this reason they may justifiably be presented first *en bloc*.

The first point of importance which emerges in connection with them is that, in an area the main story of which is industrial contraction, the Ministry of Labour figures of the insured show them to have expanded, and since they tend to display greater stability than is shown by the insured and employment data of the basic industries this is a point which perhaps cannot be emphasised too much.

15,325 in 1924, the number had expanded by 1929 to 16,725, and whereas the Survey Area only had 2.7 per cent. of these classes of workers in 1924 it had, by 1929, 3 per cent. This tendency is brought out in another way when we state that, excluding salt, the number insured in this group of industries was approximately 19 per 1,000 of the total insured population of the Area in 1924 and 21.5 per 1,000 in 1929.

Gratification at this, however, must be held in check by the reflection that, as the figures show, the proportion of workers of this kind domiciled in the Survey Area is much below the average, and by the further point that the proportion of workers in this group to the total of all insured workers in Great Britain was much

higher, being 43.8 per 1,000 of the insured in 1924 and 42.5 per 1,000 in 1929. While this is true and adds its quota of confirmation to the statement made in other sections of this Report that the Survey Area has been specialised to a high degree upon its basic industries, it is important to note that whereas the proportion in the country as a whole diminishes over the period the proportion in the Survey Area increases.

A further important point which may reasonably be given a place in this introduction to a more detailed study of these industries is that, contrary to most other industries in this Area, they find a considerable amount of work for women. They thus provide a counterbalance to the heavier basic type of industry demanding mainly men and boys of which, as compared with, say, the West Riding of Yorkshire, or Lancashire, this Area has stood in great need.

The following table shows the proportions in which they employ male and female labour, and as a guide to the relative importance of the trades listed, gives also the number insured in each per 1,000 of the total of the insured in the Area.

	No. Insured per 1,000. 1929.		Survey Area.	
	Survey Area.	Great Britain.	Per cent. of Male Labour. 1929.	Per cent. of Female Labour. 1929.
Bread, Biscuits, Cakes, etc. ...	6.0	11.8	52	48
Grain Milling	1.7	2.4	88	12
Cocoa, Chocolate and Sugar Confectionery.	3.8	6.1	27	73
Food Industries not separately specified.	3.3	9.3	36	64
Drink Industries	5.2	9.1	67	33
Tobacco, Cigars, Cigarettes and Snuff.	1.5	3.7	24	76
Salt	2.7	Not available.	61	39

Except in Salt, Drink, and Grain Milling clearly the emphasis is definitely on female labour. And further examination reveals that it is a tendency which has increased. In 1924, 52 per cent. of the workers in the group (excluding salt) were male, but in 1929 the proportion of males had dropped to 49 per cent. This may be compared with the position in the country as a whole where at both dates the proportions of males and females were 57-58 per cent. and 42-43 per cent. respectively.

With these introductory comments, and the added cautionary comments firstly that the figures on which most of the conclusions

are based are not a complete cover of all workers, seeing that in many of these industries there are many juveniles aged 14-16 employed, and secondly that these industries are in many cases subject to considerable seasonal fluctuation, and therefore a Ministry of Labour estimate based on a particular week may not give a true picture of the position over the year, we may turn to a more detailed examination of each trade we have listed. They will be taken in this order:—Bread, Biscuits and Cakes; Grain Milling; Cocoa, Chocolate, and Sugar Confectionery; Food Industries not separately specified; Drink Industries; Tobacco, Cigars, Cigarettes and Snuff; Salt.

(ii) **Bread, Biscuits, Cakes, etc.**

Amongst the Food and Drink Industries, Bread, Biscuits and Cakes take pride of place, their figure of roughly 4,100 insured workpeople being well in advance of the second on the list, which is Drink with its 3,750 in 1924 and 3,600 in 1929. And this statement might be written in terms of breadmaking and flour confectionery only, for in the Census returns of 1921 these two together accounted for no less than 96 per cent. of the total engaged in this class of activity. The making of biscuits is thus practically negligible.

The persons engaged in this class of work are widely distributed. Of the total number insured in the Survey Area in the whole industry in 1930, 43 per cent. were in the Exchange areas of Newcastle, Gateshead, and Middlesbrough in the numbers 820, 600, and 470 respectively. And the 1931 Trade Directory shows 300 bakers, probably mostly small, since only 36 undertakings appear in the Books Exchanged figures—distributed widely over the whole of the Area. In this the trade conforms to the manner in which it is distributed in the country generally.

In other respects it establishes a position of its own and differs from the position in the country generally. In doing so, however, it puts itself into accord with what seems to be the general position of this class of activity in the Survey Area, namely, that the proportion of its insured workers to the total insured population in the Area (roughly 6 per 1,000) is, in both 1924 and 1929, considerably less than the proportion in Great Britain, which was about 12.5 per 1,000 in 1924, and roughly 12 per 1,000 in 1929.

It differs also in that whereas the proportions of males and females were 50 per cent. of each in 1924 and 52 per cent. males and 48 per cent. females in 1929, the proportion of males in Great Britain was considerably higher with 65 per cent. males and 35 per cent. females in 1924 and 61 per cent. males and 39 per cent. females in 1929.

The proportionate demand for female labour relative to male labour is thus at both dates considerably higher in the Survey Area than in the country generally. Its importance to the female worker

is perhaps brought out even more clearly in that whereas in 1924 the number of insured females working in this industry was 25.5 per 1,000 of the total of the insured females of the Area, the proportion in Great Britain was considerably lower at roughly 16.5 per 1,000.

Its general activity, moreover, even in the depression, has continued to increase and not only, as the following table shows, does employment roughly keep pace with insurance, but also the rate of expansion in the Survey Area is, from 1924 to 1930, considerably greater than that in Great Britain. This relative vivacity of movement, however, seems to be a feature of the figures of the Area, for it shows also a greater proportionate decrease than the country generally between 1923 and 1924. While this to some extent discounts the value of the expansion of 1924-30 in that it represents a recovery after a steep decline the steadiness of the movement upwards and up to 1931 the accompanying steadiness of employment are still facts of importance.

*Relative Movement of Insured and Employed.
Great Britain and the Survey Area.*

Index Numbers.
(1924 = 100.)

				<i>Survey Area.</i>		<i>Great Britain.</i>
				<i>No. Insured.</i>	<i>No. Employed.</i>	<i>No. Insured.</i>
1923	...	...	...	126	125	109
1924	...	...	...	100	100	100
1927	...	...	...	95	97	99
1929	...	...	...	101	102	99
1930	...	...	...	108	107	103
1931	...	...	...	108	100	107

This activity is further evidenced by the starting of 8 bakers and confectioners, each employing more than 20 workers, who between them in 1931 employed roughly 420 workpeople. On the other hand one biscuit factory was closed which had employed roughly 250 workpeople.

Precisely where the balance is to be struck is thus a nice point of judgment. Whatever that may be the net result is clearly to increase the preponderance of Baking over Biscuit Making in the Survey Area.

It seems clear that this activity will continue. Home-baking, up till recently a factor of considerable competitive importance, may be expected to continue to decline. It is true that with the depression a tendency has developed for the proportion of home-baking to increase, but it is anticipated that this will be reversed when trade generally improves. If this is true then there is a wide field for further expansion for, though estimates vary, it may be stated that the proportion of home-baked bread to bought bread is still somewhere between 33 per cent. and 50 per cent. of the total consumed.

There is the possibility of expansion too, it would seem, in the baking of flour confectionery. The consumption per head of this has, unlike that of bread, probably been increasing. It is not a class of confectionery affected by the depression in the way peculiar to bread, and there is evidence that sales have been expanding.

Should trade improve within the next few years then it is clear that Baking and Flour Confectionery may look forward to expansion.

Whether the expansion will be as great in employment as in sales is however a matter for doubt. Many firms at the present time may well be working below capacity. The firms interviewed have stated definitely that greater output would be secured by a less than proportionate increase in employment and, finally, while we have no evidence of actual labour displacement, it is known that a good deal of improvement in machinery has been made during the last decade and there is no evidence to suggest that this is a process which will diminish. While then expansion in sales may be expected there can be no reason for expecting any great increase in the number of workpeople required. Indeed in view of the fact that the percentages of unemployment have persistently ruled higher than in the country generally, proportionate expansion might very easily be unwelcome.

(iii) Grain Milling.

In recent years this industry has shown but little sign of development. Being an industry concerned in the production of a staple food it has not been depressed as have more basic industries, but, on the other hand, being confined to the Survey Area, except for certain special kinds of product, for its market outlet, it has experienced some degree of check from Area depression.

The total number insured in the industry is not great and the figure was roughly stable at 1,150 persons in both 1924 and 1929, thus contributing roughly 4 per cent. of the workers insured in this industry in Great Britain. In both these years the number insured was 1.5 to 1.75 per 1,000 of the total insured population of the Area and—as seems to be a ruling condition in all these food industries—this was a much smaller proportion than that (roughly 2.5 per 1,000) returned for Great Britain. Unlike some other food industries, however, the majority of its workers (90 per cent.) are male; and this holds good for Area and Great Britain alike.

As regards its distribution in the Area there appears to be some degree of concentration. In 1930, 25 per cent. of the insured workers were in the Newcastle Exchange area, there being none in Gateshead and Middlesbrough. In the Census returns for 1921, 46 per cent. of the total were in Newcastle and Sunderland. A large number of the concerns, however, are small. The 1931 Trade Directory shows that there are roughly 30 millers in the Area but the Ministry of Labour returns indicate only seven undertakings

which employ more than 20 workers. Of these only 4 employ between 100 and 250 workers and these four are situated at Newcastle, Dunston, Sunderland, and Thornaby-on-Tees. Further, of these, three are connected with larger units carrying on operations in other parts of the country.

On their working side their stability relative to movements in other industries is brought out by the following table:—

Insured and Employed. Great Britain and Survey Area compared.

				Index Numbers. (1924 = 100.)		
				Survey Area.		Great Britain.
				No. Insured.	No. Employed.	No. Insured.
1923	...	...	...	84	81	92
1924	...	...	...	100	100	100
1927	...	...	...	106	104	93
1929	...	...	...	98	95	93
1930	...	...	...	107	104	91
1931	...	...	...	94	85	89

The Area thus shows greater proportionate expansion than the country as a whole, and while on the one hand this might perhaps be taken as a sign that the industry in the Area is approaching the "norm." of the country as a whole, the numbers involved in the Area are on the other hand so small that generalisation such as this would be unreasonable.

The same movement commented on already is shown also by unemployment—8.8 per cent. in a minimum year, and 11.7 per cent. in 1929, and it has increased in the depression of 1931 (to 16.4 per cent.), but this is lower than for any other food producing industry.

The general conclusion to which we are led is that the industry is, with one or two exceptions connected with the making of speciality products, of an essentially local and relatively stable type. No major factors seem to be in play to cause any considerable localisation of the industry, though it is also clear that there is still room for expansion in the Area as measured by the lower proportion of workers to total insured which the Area displays relative to the country generally. Raw material is mostly of overseas origin, labour is relatively of the unskilled type, while technical changes, with one exception in the invention of a suction conveying plant—have, in recent years been practically negligible. Our own findings are well voiced by the evidence of one large firm in the area that the industry may expect to provide employment over the next few years for roughly as many as it does at present.

(iv) **Cocoa, Chocolate and Sugar Confectionery.**

Though this industry appears under the official covering of a composite term it might, so far as this Area is concerned, be treated entirely in terms of the third category only, for the first two are almost entirely absent.

This, however, is growing increasingly in importance, and information collected suggests that it has experienced a double stimulus—one derived from an increased demand, and another derived from successful competition with other areas.

The numbers insured have thus increased from 2,050 in 1924 to 2,650 in 1929, causing an increase in their proportion to the total insured population of the Area from 2.9 per 1,000 to 3.8 per 1,000 over the same period. The figure for the country as a whole has however remained almost stable, but at a higher level, with 6.6.5 per 1,000.

The majority of the workers in the industry of the Area are females and their relative importance has been increasing. 65 per cent. of the confectionery workers of the Area in 1924 they had increased by 1929 to 73 per cent.; in the country as a whole the proportions were, on the contrary stable over the period at roughly 35 per cent. males and 65 per cent. females. The relative proportion of females in the industry of the Survey Area has thus increased and this change is further reflected in the proportion of females in the industry to the total of insured females in the Area which, 16.6 per 1,000 in 1924, had increased by 1929 to the figure of 22 per 1,000.

As regards their distribution the most important single district appears to be the Newcastle Exchange area which in 1930 included no less than 44 per cent. of the workers. A further 7 per cent. are in the Gateshead and Middlesbrough Exchange areas, but the tendency seems to have been for concentration to take place upon Newcastle, for whereas the figures of the latter show a great increase between 1923 and 1930 the figures of Gateshead show a considerable decrease. Of the fact of an increase in workers in the Area as a whole however there need no doubts be raised. The following table clearly establishes it:—

*Relative Movement of Insured and Employed.
Great Britain and Survey Area compared.*

Index Numbers.
(1924 = 100.)

	Survey Area.			Great Britain. No. Insured.
	No. Insured.	No. Employed.	No. Insured.	
1923	90	87	94	
1924	100	100	100	
1927	127	124	105	
1929	130	123	98	
1930	127	113	100	
1931	138	111	97	

While however the numbers of the insured grow—and grow it is to be noted, while those of the country remain roughly the same, it is also to be noted that in 1929 and 1931 they continue their upward movement and fail to carry employment with them. Employment shows the contrary movement of decline.

This considerable growth may perhaps be partly attributed to the relative newness of a fair proportion of the industry. Of firms employing 20 or more workers no fewer than 7 were started between 1920 and 1931 and account between them at the present time for no less than 27 per cent. of the industry's insured workers. On the other hand two firms have closed down but the number of workers involved was only 4 per cent. of the total.

Unfortunately unemployment has increased more than proportionately to the increase in the numbers insured. The year of minimum unemployment was 1924 with 6.4 per cent., 1929 had an unemployment percentage of 11.5, while 1930 and 1931 had 16.9 per cent. and 25.2 per cent. respectively. In recent years the percentages of unemployment in the Area have been higher than those in the country as a whole and it may be that this is the result of a too rapid expansion in a period of local depression.

The advance of the industry however appears to have a real basis. It possesses an advantage over old established centres from the very fact of newness of buildings and plant. Moreover, the labour supply appears to be good; one employer interviewed has stated that "there is a plentiful supply of women of an excellent type available." These and similar factors it would seem have enabled manufacturers in this area to gain ground from those of other districts. At least three or four firms established here have a national market and in these cases the Area covers but a small portion of their operations. In two, for example, it was stated that their Area sales only accounted for roughly 10 per cent. of the total. The smaller firms however serve as might be expected a market purely local.

An important feature of their activity which makes complete reliance on the insurance figures unsafe is that it is marked by considerable seasonal variation—as much, one informant has stated, as 25 per cent. on the labour employed. The slack period falls between June and August—precisely that to which the Ministry of Labour figures refer. The amount of unemployment these figures indicate is thus doubtless an over-estimate.

On the question of the effects of the introduction of machinery evidence is conflicting. In view of the fact that considerable machine improvements have been introduced this conflict is important. One firm has increased its output but diminished its labour by a third, while another stated that in recent years machinery had not displaced more than 10 per cent. of its employees. The impression we have gained is that on balance the gain of the Area at the expense of others has meant in spite of the introduction of more machinery an increased demand for labour, and that the industry's prospects of future development are, apart from the depression which has somewhat dimmed them, good. While it seems clear that more will be done by machine methods than in the past it also seems clear that, even though it may not

be to a degree proportionate to that of trade, the number employed will increase. And that there is ample room for this is confirmed if we reflect that the proportion of the insured workers in this trade to the total of insured workers in the Area is much smaller than that which obtains in the country generally.

(v) **Food Industries not separately specified.**

The industries under this head cover very diverse products. Not only are there present numerous products turned out by different firms, but also there are firms each turning out a diversity of products; while, again, some blend producing with trading. In the main, the industries covered are as follows, with the proportion of workers employed in them to the total number employed in this group as in 1921 :—

Fish curing and preserving	23 per cent.
Jam making and fruit preserving	16 "
Vinegar, pickles, spices, etc.	12 "

There is also a firm making medicinal salts and a tea-blending firm which are of some importance.

The number of workers insured in this group increased considerably between 1924 and 1929, viz. from 1,350 to 2,250. These figures represent about 1.3 per cent. and 2.0 per cent. respectively of the total number insured in the group in Great Britain. The proportion of these workers to the total insured population is still much smaller than that for Great Britain, however. The figures for 1929 are 3.3 per 1,000 for the Area; 9.3 per 1,000 for Great Britain. The majority of the workers (64 per cent.) are female though this shows a decrease since 1924 (67 per cent.). In Great Britain this proportion is considerably lower, roughly 50 per cent. in both years. The explanation of this divergence will probably be in the nature of the industries included. On the other hand, the group has offered an increasing field of employment for females in the Survey Area, but a decreasing field in Great Britain :—

Proportion of females insured to total insured female population.

	1924.	1929.
Survey Area	11.5 per 1,000	16.2 per 1,000
Great Britain	18.8 "	16.8 "

The increase in the number attached to these industries in the Survey Area could be explained by either, or a combination, of two hypotheses (i) that the Area is becoming more self contained in the matter of food production, approaching the "norm." for the country as a whole, or (ii) that these diverse industries are in some cases becoming localised, and the Area is gaining some of these. Further data would appear to confirm the latter (see below), although the first also applies.

The various industries are strongly localised within the Area itself. Thus the Census of 1921 shows that 50 per cent. of the workers in fish curing and preserving were at Tynemouth, while 34 per cent. of those engaged in jam making and fruit preserving were in Sunderland, and another 34 per cent. in Gateshead, Stockton, and Darlington. The other industries would appear to be centred mainly round Newcastle, this Exchange area containing in 1930 about 34 per cent. of the total numbers engaged. At the same period the Gateshead area contained 11 per cent., there being a large increase in these two areas between 1923 and 1930. On the other hand, there were no workers in the Middlesbrough area. At Newcastle there are firms engaged in meat preserving, tea blending and the manufacture of medicinal salts, all employing more than a hundred workers.

The figures for the number of insured workers show a remarkable increase since 1923. The workers employed have also increased at a remarkable rate, but there is some degree of divergence:—

Insured and Employed. Great Britain and Survey Area.

				Index Numbers. (1924=100.)		
				<i>Survey Area.</i>		<i>Great Britain.</i>
				<i>No. Insured.</i>	<i>No. Employed.</i>	<i>No. Insured.</i>
1923	...	...	...	86	81	90
1924	...	...	...	100	100	100
1927	...	...	...	164	161	101
1929	...	...	...	164	161	103
1930	...	...	...	171	153	107
1931	...	...	...	178	159	111

It would appear then, that the much more rapid progress of the Area as against Great Britain bears out the second hypothesis previously stated.

Expansion, however, has been largely in the existing units. Between 1920 and 1931 only two new firms were started, and these employed between them only about 50 (or 2 per cent.) of the workers in this group. In the same period two firms (both engaged in jam manufacture) were closed, one as a result of amalgamation. These affected again about 50 workers.

So far as unemployment is concerned it has been subject to fairly wide variation, but has not been sufficient to nullify the expansion. In 1924 the minimum (7.3 per cent.) was attained. 1929 had a percentage of 9.0, 1930 had 17.0 per cent., while the slump of 1931 shows a maximum of 23 per cent. In each case except 1924 these figures are higher than those for the country as a whole. This may be due partly to general depression in the Survey Area, but in view of the fact that many firms serve national markets this explanation is not entirely adequate.

No factors tending to favour localization in the Area can be found to cover all the industries. Each industry has its special feature.

Thus herring canning is obviously localized at the ports, the type of herring being particularly suitable for canning. Again, one firm deals with brising but only labels and prepares packed tins imported from Norway. Here proximity and general convenience is the governing factor. On the other hand, one meat preserving firm stated that most of its material was imported. The only obvious factor which appears here is that meat preserving may be a complementary industry to fish canning, both as regards supply of cans etc., and as regards seasonal variations. Further, one firm stated that Newcastle is a good centre for meat imports. Difficulties appear in some industries; most of the fruit used in jam making is imported from other areas or from abroad, much of it coming by water, while the firm engaged in making medicinal salts obtains almost all its materials outside the Area. It may be that chance has had some influence; one employer engaged in meat preserving said that if he had chosen his site deliberately, he would have gone to London, because of better supplies of meat, glass, and tin.

One feature does, however, clear up these points. Generally, those industries having a strong factor or combination of factors, inducing localization (e.g. herring canning) tend to have a national or export market, while those having no such factors largely serve local markets. For instance, one firm engaged in herring canning exports overseas four-fifths of its product, while one jam firm does about two-thirds of its trade in the Area. An exception is the firm making medicinal salts, which has a national market.

Generally, there has apparently been expansion in all branches. Trade depression has not had any appreciable general effect except in the case of herring canning. On the other hand, most firms appear to think that with less depressed conditions, trade would increase at a greater rate. All estimate that the demand for labour will increase, and in only two cases (manufacture of medicinal salts and meat preserving) does the increased use of machinery and changes in organization appear to have played any appreciable part in the development of the industry.

The general impression is thus one of hope for the future, based on rapid expansion in the last decade. And this expansion appears to have been the result of two developments. The more important of these is the development of industries having specially favourable facilities in the Area and possessing or developing national and export markets; and the other is the development of smaller industries having no special facilities and supplying purely local need.

(vi) Drink Industries.

Though the Drink Industries, by their variety, including as they do Beer, Mineral and Aerated Waters, Maltings, Distilleries, Manufacture of Cider and Perry present an imposing appearance an examination of the numbers insured under each heading reveals

that they may be reduced to the first two named. In the Census returns of 1921 these two together accounted for no less than 94.5 per cent. of the total, and of this no less than 72 per cent. had to be placed to the account of Beer Brewing. This process of reducing them to their true proportions has to be carried still further. Not only do the Insurance statistics show that both in 1924 and 1929 with 3,750 and 3,600 insured workers respectively, they accounted for only 3.5 per cent. of the total number insured in the industry for Great Britain as a whole, but they also show that, again at both dates, their ratio to the total number insured in the Area was considerably less than the proportion for the country as a whole. In the latter instance the proportion was roughly maintained at about 9-9½ per 1,000 of the insured population whereas in the Area the proportion was only 5-5½ per 1,000.

On the other hand the industry in the Area offers employment to a slightly greater proportion of females than is the case for the country, but this is somewhat discounted by a tendency over the period for the ratio of males to females in the Area industry to increase, and by the further fact that in any case the total employment they offer is not great. In 1924, 63 per cent. of the insured workers in the industry in the Area were males and 37 per cent. females. By 1929, this proportion had changed to one of 67 per cent. males and 33 per cent. females. In the country the proportion had, on the contrary, remained roughly stable at 78-79 per cent. males and 21-22 per cent. females.

This tendency on the part of the industry to offer proportionately less employment to female workers seems also to be reflected in the fact that whereas in 1924 it covered roughly 17 per 1,000 of the total of insured females in the Area it covered in 1929 only 13.5 per 1,000, while in the country as a whole the ratio for both dates remained steady at 7.5 per 1,000.

So far as the distribution of this kind of activity is concerned it would appear that while, as might be expected, each large urban centre in the Area makes its contribution the greatest contribution is made by Newcastle and Sunderland. According to the Census returns of 1921, 58 per cent. of the persons employed in maltings and breweries were in Newcastle and Sunderland, while another 21 per cent. were evenly distributed between Gateshead, Middlesbrough, Darlington, and Stockton, and 47 per cent. of the persons engaged in the manufacture of Mineral and Aerated Waters were in Newcastle, Gateshead and Sunderland.

Taking now the Insurance statistics, of the total number insured in the whole industry in the Survey Area, 35 per cent. were in the Newcastle Exchange area and another 13 per cent. in the Gateshead and Middlesbrough Exchange areas. Between 1923 and 1930 it also seems that there was a great increase in the numbers insured in this industry in the Newcastle Exchange area.

While this indicates a fair degree of concentration of workpeople it must also be placed on record that an examination of the 1931 Trade Directory reveals a fair degree of dispersion of manufacturing activity. 77 brewers, maltsters, and ale and stout bottlers were distributed in 21 places, while 67 aerated water manufacturers were distributed between 23 places. It is true that many of these places must be small—the Books Exchanged yield us only 28 firms of the former class recorded as employing in 1931 more than 20 workpeople and 8 undertakings in the latter class—but it is also true that the Books Exchanged have not been found a complete cover of *all* firms even of these employing over 20 workpeople and also true, though no doubt also *trite*, that smallness is not necessarily a quality precluding the possibility of expansion. Economic History seems to show that it might almost be considered a pre-requisite.

These general points considered we may turn now to the way in which employment and insurance in this industry have varied between 1923 and 1930, and also relatively to the country as a whole. The data on which discussion will be directed may be presented thus:—

Insured and Employed. Great Britain and Survey Area compared.

Index Numbers.

(1924 = 100.)

				<i>Survey Area.</i>		<i>Great Britain.</i>
				<i>No. Insured.</i>	<i>No. Employed.</i>	<i>No. Insured.</i>
1923	...	...	...	86	85	93
1924	...	...	...	100	100	100
1927	...	...	...	102	100	101
1929	...	...	...	95	97	101
1930	...	...	...	93	89	102
1931	...	...	...	99	85	105

Thus comparing the numbers insured there was a larger proportionate increase in the Survey Area than in Great Britain between 1923 and 1924, but between 1927 and 1930 the Survey Area shows a decline while the expansion of the figures for Great Britain is, after a period of relative steadiness, continued.

The decline in the index of the employed is even more pronounced.

The position of the industry in the Survey Area relative to that in Great Britain is thus not a favourable one. And this judgment is confirmed by a glance at the percentages of unemployment. The unemployment percentages were higher in the Survey Area than in the country as a whole for all the five years considered.

What then, in view of these established facts, is the future of the industry in the Area likely to be? Enquiry from firms in the trade has not always helped. The tendency has been, it would seem, to speak not so much for the Area as a whole but for their own particular firm. The general position has therefore to be

gleaned from sometimes contradictory reports. One firm has stated that trade and employment have been fairly steady, while another has stated that trade and employment have been growing progressively worse. Two points however seem clear.

Firstly, the brewing industry is dependent to a considerable extent upon the state of trade, and since the brewing industry here caters in the main for an Area market, this means the state of trade within the Survey Area. And secondly variations in employment do not tend to be as great as variations in trade, partly, it is suggested because at least one firm has pursued a policy of short time working rather than that of outright dismissal, and also partly because by the nature of the process of brewing the number of workers needed does not vary proportionately with the amount produced. While this is important as a stabilising factor in employment in the past it clearly means also that at present some brewing firms are employing more workers per unit of output than they would if trade were good and that an increase of trade in the future will not mean a proportionate increase in employment. One firm, for example, stated that between 1920 and 1931 its output fell 50 per cent. while its employment fell only 30 per cent., 0.26 persons being employed per 100 barrels in 1920 and 0.34 persons per 100 barrels in 1931. What has happened in this direction can clearly in this case also happen in reverse.

In aerated water manufacture the position is much the same. One manufacturer reports depression and another a level of activity roughly stable. But again the link between the fortunes of this section of the trade and the state of trade in the Area generally can be established. The main consumers, it has been stated, are children whose spending power has been cut down because of lowered family incomes.

It seems probable therefore that when the state of trade generally improves both these sections will improve also. But it is also probable that employment will not increase to the same degree. It will be an improvement reflected not so much in workers employed as in sales. Whether this relatively slighter increase in employment is likely to be still further diminished by improvements in machinery is a question very difficult to decide. No remarkable improvements in machinery appear to have been made in either section recently, and such displacement of workers as has been made has been due to closures consequent upon amalgamation.

The movement is not great, however, and is compensated for by new ventures started elsewhere in the Area. Among brewing undertakings employing more than twenty workers one undertaking has been started since 1920 and employed in 1931 20-30 work-people; two were closed down and involved between them 70 work-people. Among aerated water undertakings, one undertaking was started and employed in 1931 50-60 workers, and one was closed down involving 25 workers. The balance is thus roughly even.

The position is further complicated by the fact that should sales expand then improved machinery which managements are not disposed to instal on the present basis of receipts might easily be introduced and thus relatively diminish their labour demand.

While then it is true that the relative decline in this industry is probably to be accounted for by its dependence upon industry in the Area generally and by this latter's peculiarly depressed condition it would be unwise to conclude that with general trade improvement and a consequent expansion in its sales there would be a proportionate increase in the amount of labour it would need. In view of these facts it would certainly be safe to say that it is not likely to demand a greater volume of labour than in 1927, a year of peak activity so far as the late post-war period is concerned, when it found employment for 3,445 workers.

(vii) **Tobacco, Cigars, Cigarettes and Snuff.**

This industry is one which may be described as small but compact. Only 716 persons were returned by the 1921 Census returns as being engaged in it, and of these 96 per cent. were in Newcastle. In 1924 the number of persons recorded as being insured in it amounted roughly to 800 and by 1929, after a period of expansion the number of insured was 1,050 persons. Of these, 90 per cent. were in the Newcastle Exchange area, while the majority of the remainder were to be found in the Gateshead Exchange area.

The 1931 Trade Directory mentions 7 tobacco manufacturers in the Area, and of these, 4 were in Newcastle and 3 in Alnwick. The industry is thus remarkably small and even though its figures suggest that it has expanded it does not account, even in 1929, for more than about 2.5 per cent. of the total number insured in this industry in Great Britain. In the Area it covered only 1.1 per 1,000 of the total insured population of the Survey Area in 1924 and no more than 1.5 per 1,000 in 1929. The proportion in Great Britain, 3.7 per 1,000 of the insured population, was thus more than twice as great.

As regards its employment of males and females respectively the position in the Survey Area is much the same as in the country generally, though there is a tendency towards the employment of relatively more females over the period 1924-1929 which, in the country, is absent.

The proportion of males and females in the Area was 30 per cent. and 70 per cent. respectively in 1924 and 24 per cent. and 76 per cent. respectively in 1929.

In Great Britain the proportion remained roughly stable over the period with a proportion of 31-32 per cent. males and 69-68 per cent. females.

As a result the proportionate amount of work it offered to females moved up over the period relative to the proportion ruling for the country as a whole. 7 per 1,000 of the total of females insured in the Area in 1924, the proportion had risen by 1929 to 9½ per 1,000, a figure roughly equal to that shown by Great Britain for the whole of the period.

So far the data examined contain no hint of difficulty. It is otherwise, however, when we turn to an examination of the movement of the insured and the employed. They show an increase up to 1929 which as the following table shows is not true for the country generally, and further it is an increase for which no confirmation has been found by enquiry amongst manufacturers themselves; nor is it confirmed by the movements displayed by the figures of the Books Exchanged in July.

*Relative Movement of Insured and Employed.
Survey Area and Great Britain compared.*

				Index Numbers.		
				(1924 = 100.)		
				<i>Survey Area.</i>		<i>Great Britain.</i>
				<i>No. Insured.</i>	<i>No. Employed.</i>	<i>No. Insured.</i>
1923	...	...	...	95	91	101
1924	...	...	...	100	100	100
1927	...	...	...	142	141	97
1929	...	...	...	131	132	106
1930	...	...	...	84	75	109
1931	...	...	...	83	74	109

To sum up, however, is not difficult. Considerable trade is done outside the Survey Area and a general increase in the consumption of tobacco has cancelled any tendency which might show itself for sales in the Area to diminish. The effects of the depression though, appear to have been only slight—a position indeed not difficult to explain.

There seems too, to be a fairly general expectation that trade will increase, and though the position would seem to be that the expansion in sales would not call for a proportionate expansion in labour it is anticipated that some increase in the demand for labour, particularly for female labour will be made. One firm indeed—but before the recent increase in the duties it is true—was contemplating large extensions to its factory and was obviously budgeting for a considerable increase both in its output and in the number employed. Although the expansion which the trade seems to anticipate would almost certainly be accompanied by the installation of the highly intricate machinery for which this industry is well known, it is by no means certain that the demand for labour would proportionately diminish, for enquiry has established fairly definitely, it would seem, that mechanization has gone on to a high degree already, and that not much more, at least within the next few years will be possible. This section of our enquiry may fittingly end then by noting the optimism which seems to prevail, the readiness to expand which seems only

to be waiting its chance, and by the further and seemingly conclusive point that while no firm has closed down during the period under review, an additional firm employing 20 workers has been started.

(viii) **Salt.**

The Census returns of 1921 showed the salt manufacturing industry of this Area to be one of considerable importance. No less than 17 per cent. of the activity connected with salt mines, brine wells, and salt works in England and Wales was carried on here. This is a proportion much bigger than that of any other industry of this section. This is seen clearly if we refer now to the position as shown by the figures of the Ministry of Labour, though it is also clear that as a field of employment its importance since 1924 has slightly lessened. In 1924 it covered 3 per 1,000 of the whole insured population; by 1929 this proportion had fallen, however, to about 2.7 per 1,000. This decrease appeared also in the absolute figures which fell from 2,100 to 1,900 in the same period. The relatively intense localization of the industry, however, determined by the presence of brine wells in the region of the Tees estuary still ensures an Area proportion greater than that for the country as a whole. Of the insured workers about two-thirds were, in 1924, male but since then the ratio of males to females has declined and in 1929 the percentage of males was roughly 60. This provides a striking contrast with the industry in the country generally for in this case the proportion of males was in 1921 roughly 80 per cent. of the total.

This is further emphasised if we compare the position of the Area with that of the country in 1921. The Survey Area then contained 17 per cent. of all workers engaged in the industry but 45 per cent. of the females. The reason probably resides in the nature of the industry in the Survey Area. One of its largest undertakings is engaged in the manufacture of refined salts and gravy salts and four-fifths of its employees are females. As is the rule in the country generally workers employed in the manufacture of coarse salt are almost entirely male but this branch is here less important than in other areas.

This decrease in numbers and a striking and growing divergence between the numbers insured and the numbers employed is brought out by the following table:—

Numbers Insured and Employed.

Index Numbers.

(1924 = 100.)

	<i>Survey Area.</i>	
	<i>No. Insured.</i>	<i>No. Employed.</i>
1923	85	75
1924	100	100
1927	88	84
1929	90	87
1930	95	79
1931	82	57

That this is mainly the result of the depression—though other more long period factors too are clearly at work—is perhaps shown by the figures for 1931. Only one firm has closed down since 1920 and this affected only 50 (2.5 per cent.) of the workers. Much the same trend is shown also by the figures of unemployment. The year of minimum unemployment was 1924 with a percentage of 3.8. This has steadily increased to reach its maximum (32 per cent.) in 1931.

A more detailed examination of this last figure, however, reveals an interesting position. It is composed of two figures—one of 47 per cent. for unemployment amongst males and one of 12 per cent. for females. A somewhat similar position is revealed by an examination of the figures for 1930 when a composite 19.7 per cent. can be split up into 26 per cent. for males and 9 per cent. for females. The inference from this is that the depression has been more severely felt in the coarse section than in the refined section. And the validity of this is confirmed by evidence of expansion of trade in the large firm making refined salts. At the same time, however, as there have been the effects of the depression there has also been some displacement of labour by machinery and the large firm already mentioned stated that it could turn out a considerably greater amount of some of its products than at present without employing more workers. Its position is also more stabilised than that of the smaller concerns in that it produces a variety of products to overcome seasonal variations and has also built up connections with a large national market and overseas. The smaller works may be confined to local markets and have experienced decline because of the more acute local depression.

The general conclusion which emerges from these facts, therefore, is that at present the industry as a whole appears to be experiencing acute depression but that in reality this is visited more heavily upon the makers of coarse salts than upon the makers of refined salts. This is due to several factors but the main reason would seem to be the former's more limited market and the depression with which that is at present afflicted.

[*Note.*—For the purposes of this section the Ministry of Labour data for "Mining and Quarrying not separately specified" for the N.E. Area is taken as equivalent to salt-mining, brine wells, and salt works. The other branches in this classification (such as oil, shale, alum, etc.) are of minor importance and can be neglected. For Great Britain, however, this cannot be done, and hence it is almost impossible to obtain any exact comparisons. Moreover there is great difference between the Ministry of Labour returns of the total numbers employed and those of the Books Exchanged for workers employed in the individual undertakings. This is probably due to there being some salt manufacture carried on as part of the activity of general chemical concerns, and not appearing in the Employment Exchange returns under a separate heading.]

XI.—THE MINOR INDUSTRIES AND SERVICES.

(Memorandum by Miss C. Braithwaite and
Professor H. M. Hallsworth.)

(i) The Glass Trades.

Importance of the Industry in the Survey Area.

The glass trades, both from the point of view of the number of firms and of the workers attached to the industry, form one of the minor industries of the Area. Neglecting firms employing less than 20 persons, as shown by the exchange of Unemployment books in July each year, there appear to be 6 firms in the Area engaged in general glass manufacture, and three firms who specialise in the manufacture of glass bottles. Of the former, one is at Newcastle, two at Gateshead, one at Lemington-on-Tyne, one at Sunderland, and one at Southwick-on-Wear; of the latter, one is at Newcastle, one at Seaham Harbour (which however closed down in 1925), and one at Thornaby.

The highest number of workers employed by any of these firms, as measured by the exchange of books in July each year, is 433, and the lowest 43. In general glass manufacture, the average number would appear to be about 200 workers: in glass bottle manufacture about 80.

In 1924, the number of insured workers in the industry in the Survey Area is given as 2,470 but this number had shrunk to 2,140 in 1929. In 1924, therefore, the number of insured workers in the Survey Area formed about 5.5 per cent. of the total number of insured workers in the industry in Great Britain, whilst the percentage in 1929 was about 4.75. From this point of view, therefore, the glass industry of the Survey Area is an important section of the whole industry, but in relative importance it would seem to be declining, as the following index numbers of insured persons in the industry indicate, 1924 being taken as 100:—

	1923.	1924.	1927.	1929.	1930.	1931.
Survey Area	109	100	96	86	96	94
Great Britain	97	100	95	100	102	103

The difference is not marked, but it seems to indicate that whilst the trade in Great Britain has slightly expanded, that of the Survey Area has contracted.

It is, however, a minor industry in the Survey Area itself, since in 1924 the number of insured workers formed only 3.5 per 1,000 of the total insured population of the Area, and in 1929 the proportion fell to 3.1 per 1,000. Of the 2,140 insured workers in 1929, 300 were attached to the glass bottle trade, and 1,840 to the general glass manufacturing trades. In 1924 of the total number of insured workers in the Area, 77 per cent. were male and 23 per cent. female workers. In 1929 the percentages were 75 and

25, and in 1930, 70 and 30 respectively. Thus the number of women workers in the industry in the Survey Area seems to be increasing: and the same is found to be true of the industry in the country as a whole, where, however, the percentage of male workers is higher, being 85 per cent. in 1924 and 81 per cent. in 1929.

Unemployment.

The following table, compiled from information specially supplied by the Ministry of Labour, and based on the exchange of Unemployment books in July each year, gives the number of insured persons in the industry in the Survey Area:—

Numbers of Insured Persons.

Year.	Men.	Boys.	Total Males.	Index No. 1924=100.	Women.	Girls.	Total Females.	Index No. 1924=100.	Total Persons.	Index No. 1924=100.
1923 ...	1,880	280	2,160	118	420	110	530	95	2,690	109
1924 ...	1,710	200	1,910	100	440	120	560	100	2,470	100
1927 ...	1,650	180	1,830	96	480	70	550	98	2,380	96
1929 ...	1,480	120	1,600	84	470	70	540	96	2,140	86
1930 ...	1,500	150	1,650	86	620	100	720	129	2,370	96
1931 ...	1,470	180	1,650	86	570	110	680	121	2,330	94

The numbers unemployed at approximately the same date in June each year are given in the following table:—

Year.	Men.	Boys.	Total Males.	Percentage Unemployed.	Women.	Girls.	Total Females.	Percentage Unemployed.	Total Persons.	Percentage Unemployed.
1923...	725	64	789	36.5	74	6	80	15.1	869	32.3
1924...	699	47	746	39.1	52	8	60	10.7	806	32.6
1927...	809	17	826	45.1	64	4	68	12.4	894	37.6
1929...	652	15	667	41.7	68	3	71	13.1	738	34.5
1930...	674	16	690	41.8	111	8	114	15.8	804	33.9
1931...	700	48	748	45.0	102	17	119	25.8	867	39.6

It will be seen that the percentage unemployed is much higher among the male workers than among the female workers. Moreover, the percentage unemployment for all workers in the industry is much higher in the Survey Area than in Great Britain and Northern Ireland as a whole, where the percentage unemployed for the years named are, respectively, 19.1, 13.5, 11.8, 11.1, 16.8, and 24.8.

It will thus be seen that whilst the industry in the Survey Area made some recovery in 1930 from the depression in 1927, and probably adjacent years, the general impression obtained from the above two tables is that of a relatively declining industry. To what is this decline due? Several of the firms whom we have consulted in the matter ascribe it to their inability to meet foreign competition in the home market. This may be true to a certain extent, but that it is not the sole cause is shown by the fact that the decline is not shared by the industry of the country as a whole, or at least not to the same extent.

To a certain extent we feel that it may be due to a lack of enterprise on the part of some of the firms concerned. Several firms in the food industries have informed us that the glass made in the area is not suitable for their requirements. Thus a meat preserving firm stated that the local glass ware is not of high enough quality for its packing; and that it has to get what it requires from the London area. Another meat preserving firm told us that the local bottle makers do not make small bottles; and it therefore has to get its supplies from Canning Town. A firm manufacturing medicinal salts found the local bottles unsuitable, because they were usually of green and not white glass. A firm making jams, sauces, and pickles gets some of its bottles from local makers, but most of them from Yorkshire firms.

We cannot but feel that a closer attention to local needs would enable the local manufacturers to obtain many orders which at the present time are going to makers in other parts of the country.

On the other hand there are several firms in the Area which have shown marked enterprise in recent years. One firm at Sunderland, making glass ware for domestic use, started in 1923 the making of a proprietary article of domestic glass ware. The result has been a considerable development of its business especially during the period 1923-1926 though since 1926 the advance has been more gradual. It has had to extend its works, and has been able to install the most up-to-date equipment in recent years.

Another firm in the Area has shown equal enterprise in a number of directions, but especially in the manufacture of tinted glass ware for table and decorative purposes.

These are two illustrations of what can be done in the industry when firms are willing to show initiative and enterprise. The glass making industry is an old-established one on Tyneside, and so far as our information goes there is no reason why it should not continue to flourish there.

(ii) The Pottery Industry.

Except for one firm in Newcastle the Pottery Industry of the Survey Area might be neglected, since it occupies a very small fraction of the industrial activity of the Area. The one firm mentioned employs at least three-quarters of the whole of the workers in the industry in the Area, but one of its branches was closed down in 1927. A small firm at Blyth closed in 1926. Of the two other firms of which we have information, one is at Sunderland and employs between 20 and 30 workers, and the other is near Stockton and employs between 60 and 80 workers.

In 1924 the pottery workers in the Area formed 1.4 per 1,000, and in 1929 1.3 per 1,000 of the total of insured workers in the Survey Area; the proportions in Great Britain being 6.5 and 6.2 per 1,000 respectively. They formed in 1924 1.3 per cent. and in 1929 1.2 per cent. of the insured pottery workers of Great Britain.

In the Survey Area the female workers outnumber the male workers, the proportions being 67 per cent. females and 33 per cent. males in 1924; but by 1929 the proportions in the Survey Area had changed considerably; the percentages in that year being 51 females and 49 males. The total numbers are, however, small and we must not press this change in proportions too far. It is interesting chiefly because it is a change towards the position in the industry in Great Britain as a whole, where the proportion of male workers was 51 per cent. in 1924, and 47 per cent. in 1929; though curiously here the change has been in the opposite direction.

In 1924 the number of insured female workers in the industry in the Survey Area formed 8.2 per 1,000 of the total of insured female workers in the Area; but in 1929 the proportion had fallen to 5.3. The proportions in Great Britain were 12.0 per 1,000 in both years.

The following table extracted from figures compiled by the Ministry of Labour from the exchange of Unemployment books in July each year, gives the number of insured workers in the industry in the Survey Area:—

Year.	Men.	Boys.	Total Males.	Women.	Girls.	Total Females.	Survey Area.		Great Britain.	
							Total persons.	Index No. 1924=100.	Total persons.	Index No. 1924=100.
1923...	380	90	410	540	90	630	1,040	105	71,970	98
1924...	300	30	330	540	120	660	990	100	73,570	100
1927...	470	20	490	450	60	510	1,000	101	69,780	95
1929...	420	30	450	400	70	470	920	93	73,790	100
1930...	420	30	450	430	90	520	970	98	78,450	107
1931...	400	30	430	450	90	540	970	98	78,560	107

The industry in the Survey Area as judged by the number of insured workers, appears to be losing ground relatively to the industry as a whole.

The following table shows the incidence of unemployment in the industry in the Survey Area and in Great Britain and Northern Ireland, as measured by the unemployment figures in June each year:—

Year.	Survey Area.					Gt. Britain and Northern Ireland.
	No. of Persons Insured.	Index No. 1924=100.	No. of Persons Employed.	Index No. 1924=100.	Percentage Unemployed.	Percentage Unemployed.
1923...	1,040	105	815	91	21.6	10.7
1924...	990	100	894	100	9.7	10.7
1927...	1,000	101	782	87	21.8	13.7
1929...	920	93	840	94	8.7	13.8
1930...	970	98	793	89	18.2	26.3
1931...	970	98	705	79	27.3	36.4

The variations in the percentage unemployed in the Survey Area are worthy of note. The industry appears to be subject to considerable fluctuations of business activity from year to year. In this industry, as in the leather trades, the percentage of unemployment for male workers differs considerably from that for female workers, though in this trade they rise and fall together. Thus the percentage in the case of male workers has varied in the above years, to 1930, from 10.6 to 19.4, whilst the variation in the case of female workers has been from 6.6 to 25.6. The variation in Great Britain and Northern Ireland also appears to be slightly less for men than for women, though the range in both cases is wider.

(iii) The Textile Industries.

The Textile Industries form but a very small proportion of the industrial activities of the Survey Area. The chief section represented in the Area is the manufacture of hemp, rope, cord, twine, etc. The hosiery trades, the linen industry, the carpet manufacturing industry, the silk industry, are just represented, and that is all; but there appear to be no representatives of the cotton, jute, and lace sections nor any bleaching, dyeing, or printing processes carried on for the textile trades proper.

It is difficult to see how any section of the textile industries, except that of hemp, rope, etc., can be carried on economically in the Survey Area so far removed as it is from the main centres of these industries. A small woollen mill at Otterburn flourishes partly because it has a home supply of wool at hand, but chiefly because it specialises in a special range of rugs and cloths for which it has established a reputation. It, therefore, survives because it specialises by "product," and not, as in the case of firms in the woollen industry of Yorkshire, or to a greater extent in the cotton industry of Lancashire, by "process." The same is true of an old established cotton mill at Carlisle, which carries through the whole of the processes of carding, spinning, weaving, printing or dyeing itself, and specialises on a narrow range of products, chiefly suit and dress linings. Even so, it is handicapped in many ways by its remoteness from Liverpool and Manchester, the marketing centres of raw cotton and of yarn.

The kind of textile industry in the Survey Area is exemplified by the woollen mill at Otterburn, and by a flax-spinning mill at Barnard Castle, which after carrying on under great difficulties by short time working for many years, finally gave up the struggle in 1929 when the plant was dismantled, the number of workers affected at the time of closing being about 95.

The total number of insured workers in this group of industries in the Survey Area was 3,750 in 1924, a number which fell to

3,160 in 1929 and 3,410 in 1930. Thus only about 0.3 per cent. of the insured workers in the textile industries of Great Britain are to be found in the Survey Area. In the case of the hemp, rope, cord, etc. section, however, the percentages are no less than 12.6 in 1924 and 10.9 in 1929; the numbers in 1924 being 2,210 and in 1929 1,790.

According to the Census of Production of 1924, the number employed in the textile industries of the Survey Area was 2,547, or 0.2 per cent. of the number employed in Great Britain and Northern Ireland. The gross output was valued at £1,497,000, or 0.2 per cent. of the gross output of the country, and the net output at £536,000, again 0.2 per cent. of the net output of the country. The net output per head was £210, as compared with £175 for the whole country—a rather interesting comparison; and the horse power of engines employed was 4,974, or again, 0.2 per cent. of the horse power used in the textile industries of the whole country.

Of the 3,160 insured workers in the industry in the Survey Area in 1929, the following numbers were insured in the different sections of the industry :—

Hemp, Rope, Cord, Twine, etc.	...	...	...	...	...	1,790
Woollen and Worsted	...	...	...	...	...	740
Hosiery	...	...	...	...	...	130
Carpets	...	...	...	...	...	130
Linen	...	...	...	...	...	120
Silk, including artificial silk	...	...	...	...	...	20
Textiles, not separately specified	...	...	...	...	...	230

Thus 57 per cent. of the total of insured persons were in the first named section.

In 1924 the number of insured workers in the industry in the Survey Area formed 5.3 per 1,000 of the total insured population of the Area; in 1929 it had fallen to 4.6 per 1,000. The proportion in Great Britain was more than 20 times as great, being 109 per 1,000 in 1924, and 104 per 1,000 in 1929.

This, again, is an industry mainly run by women workers. The proportions were in 1924 29 per cent. males and 71 per cent. females, and in 1929 27 per cent. and 73 per cent. respectively. The proportions in Great Britain were for both years 39 per cent. males and 61 per cent. females.

In 1924 the number of females insured in the industry in the Survey Area was 33.4 per 1,000, and in 1929 26.2 per 1,000 of the total of insured female workers in the Area. The corresponding proportions in Great Britain were 252 per 1,000 in 1924, and 232 per 1,000 in 1929.

The following table, extracted from returns compiled by the Ministry of Labour from the exchange of Unemployment books

in July each year, gives the insured workers in the industry in the Survey Area :—

Year.	Men.	Boys.	Total Males.	Women.	Girls.	Total Females.	Survey Area.		Great Britain
							Total Persons.	Index No. 1924=100.	Index No. 1924=100.
1923 ...	800	90	890	2,020	360	2,380	3,270	87	99
1924 ...	950	120	1,070	2,180	500	2,680	3,750	100	100
1927 ...	760	70	830	1,860	420	2,280	3,110	83	98
1929 ...	760	80	840	1,860	460	2,320	3,160	84	99
1930 ...	760	80	840	1,990	580	2,570	3,410	91	101
1931 ...	820	70	890	1,930	320	2,250	3,140	84	100

In the Survey Area, therefore, there has been a decline in numbers, whilst in Great Britain they have remained relatively stationary .

The following table shows the incidence of unemployment in the Survey Area, and in Great Britain and Northern Ireland, as measured by the unemployment figures in June each year :—

Year.	Survey Area.					Gt. Britain and Northern Ireland.
	No. of Persons Insured.	Index No. 1924=100.	No. of Persons Employed.	Index No. 1924=100.	Percentage Unemployed.	Percentage Unemployed.
1923...	3,270	87	2,840	83	13.1	—
1924...	3,750	100	3,431	100	8.5	11.3
1927...	3,110	83	2,803	82	9.9	8.2
1929...	3,160	84	2,738	80	13.4	12.3
1930...	3,410	91	2,688	78	21.2	31.4
1931...	3,140	84	2,305	67	26.6	34.6

A peculiar feature of these figures for the Survey Area is the divergence between the numbers insured and the numbers employed between 1929 and 1930, the former rising and the latter falling. This probably is one cause of the high unemployment percentage figure in 1930.

(iv) The Clothing Trades.

According to the Census of Production of 1924, the Clothing Trades (which in this classification includes laundries and dyeing) in the Survey Area employed a total of 7,016 persons, or 1.2 per cent. of the number employed in the industry in the United Kingdom. The gross output was valued at £1,626,000, or 0.8 per cent. of that of the United Kingdom, and the net output at £898,000, or 1.0 per cent. of that of the United Kingdom. The net output per head was £128 as compared with £156 for the United Kingdom. The horse power of engines employed was 1,813, or 1.2 per cent. of that in the United Kingdom.

Of the 6,440 insured workers in the industry in the Survey Area in 1929, the following were the numbers in the different sections of the industry :—

Tailoring	3,780
Dress Making and Millinery	1,370
Hats and Caps (including straw plait)	70
Shirts, Collars, Underclothing, etc.	330
Boots, Shoes, Slippers and Clogs	790
Not separately specified	100

In 1924 the number of insured workers in the industry was 9.9 per 1,000 of the total insured population of the Area, whilst in 1929 it was 9.3 per 1,000. The corresponding figures for Great Britain are 48.4 and 47.1 per 1,000 respectively. In 1924 the Survey Area workers in this industry formed 1.3 per cent. and in 1929 1.2 per cent. of the insured workers in the industry in Great Britain.

The majority of the workers in the industry are females; the proportions in the Survey Area being 66 per cent. females and 34 per cent. males in 1924, 70 per cent. and 30 per cent. in 1929; whilst in Great Britain the proportions were 64 per cent. and 36 per cent. respectively in 1924, and 66 per cent. and 34 per cent. in 1929. In both areas therefore, the proportion of female workers is increasing.

It is an important field of employment for women workers in the Survey Area. In 1924 57.7 per 1,000 and in 1929 50.8 per 1,000 of the total number of insured women workers in the Area were included in this industry, but the proportions in the country as a whole were more than twice as great, being 118 per 1,000 in 1924, and 112 per 1,000 in 1929.

The following table, extracted from figures compiled by the Ministry of Labour from the exchange of Unemployment books in July each year, gives the number of insured workers in the industry in the Survey Area :—

Year.	Men.	Boys.	Total Males.	Women.	Girls.	Total Females.	Survey Area.		Great Britain.	
							Total Persons.	Index No. 1924=100.	Total Persons.	Index No. 1924=100.
1923...	2,340	240	2,580	4,200	830	5,030	7,610	109	552,090	100
1924...	2,150	220	2,370	3,850	770	4,620	6,990	100	551,540	100
1927...	2,190	160	2,350	4,010	860	4,870	7,220	103	551,490	100
1929...	1,790	160	1,950	3,660	830	4,490	6,440	92	555,960	101
1930...	1,780	160	1,940	3,850	890	4,740	6,680	96	560,880	102
1931...	1,800	160	1,960	4,040	900	4,940	6,900	99	580,260	105

The industry in the Area, therefore, shows a slight contraction of persons attached to the industry, whilst in Great Britain there is a slight expansion.

The following table shows the incidence of unemployment in the industry, both in the Survey Area and in Great Britain and

Northern Ireland, as measured by the unemployment figures in June each year:—

Year.	Survey Area.				Gt. Britain and Northern Ireland.	
	No. of Persons Insured.	Index No. 1924=100.	No. of Persons Employed.	Index No. 1924=100.	Percentage Unemployed.	Percentage Unemployed.
1923...	7,610	109	6,925	111	9.0	—
1924...	6,990	100	6,264	100	10.4	5.9
1927...	7,220	103	6,737	108	6.7	4.1
1929...	6,440	92	5,995	96	6.9	6.2
1930...	6,680	96	5,942	95	11.0	9.5
1931...	6,900	99	5,668	90	17.9	12.8

Trade slackness throughout the period from 1923 has been fairly general in the industry throughout the Survey Area, but compared with other industries in the Area, the clothing trades have been relatively prosperous. 1929 was a distinctly better year than 1924, but a change for the worse in this, as in most other industries in the Area, is noticeable in 1930.

(v) Leather and Leather Goods Manufacture.

Of the two sections into which this industry is divided the first, that of tanning, currying and dressing of leather, occupied rather more than half of the workers in the industry in the Survey Area in 1929, the respective numbers being 600 and 450. Of these 1,050 no less than 710, or 68 per cent., were in the Newcastle area. There is an old established leather works in Newcastle, whose products are well known in the trade. It has of recent years strengthened its position by the manufacture of acid free dressed skins, specially suitable for book-binding and other purposes requiring a leather of lasting quality, and of good finish and colour. A tannery at Crook, County Durham, has been closed in the period 1926-1930. The Co-operative Wholesale Society started a factory at Newcastle during the War for the manufacture of leather goods. It is the only leather goods factory belonging to the Society and it supplies leather goods to Co-operative Stores all over the country. The factory also makes attaché cases, etc. of paper and vulcanised fibre. At present it employs about 150, mostly women. The management of this factory anticipates that its sales and the number of its workers will continue to increase.

There are nine firms in the industry in the Survey Area of which we have information. Five are at Newcastle, three of them being leather manufacturers, one a firm of furriers and skin merchants, and one making bags; one at Hexham is a firm of tanners, one at Stockton is engaged in hide and skin curing, two on Tees-side are fell-mongers and hide and skin factors.

Taking the Survey Area as a whole the insured workers in the industry formed in 1924 1.8 per 1,000 insured persons in the Area, and in 1929 1.5 per 1,000, whereas the proportion in Great Britain was 6.2 per 1,000 in 1924 and 5.7 in 1929. The numbers in the Survey Area formed 1.8 per cent. in 1924 and 1.6 per cent. in 1929 of the total number in this group in Great Britain. The Area therefore contains a very small proportion of the total industry.

It is an industry in which male labour predominates. In 1924 of the total number of insured workers in the industry in the Survey Area, 70 per cent. were males and 30 per cent. females; in 1929 the proportions were 76 and 24 per cent. respectively. In Great Britain the proportion of women workers in the industry has increased, being 30 per cent. in 1924 and 35 per cent. in 1929.

In the Survey Area in 1924 the industries included 4.9 per 1,000 of the total of insured female workers, but only 2.8 per 1,000 in 1929. The proportions in Great Britain were 7.2 per 1,000 in both years.

The following table, extracted from figures compiled by the Ministry of Labour from the exchange of Unemployment books in July each year, gives the number of insured workers in the industry in the Area :—

Year.	Men.	Boys.	Total Males.	Women.	Girls.	Total Females.	Survey Area.		Great Britain.
							Total Persons.	Index No. 1924=100.	Index No. 1924=100.
1923 ...	790	40	830	330	30	360	1,190	92	100
1924 ...	850	50	900	360	30	390	1,290	100	100
1927 ...	730	30	760	180	20	200	960	74	95
1929 ...	760	40	800	200	50	250	1,050	81	95
1930 ...	680	50	730	220	60	280	1,010	78	94
1931 ...	670	40	710	260	50	310	1,020	79	94

Both in the Survey Area and in Great Britain the industry has declined, judged by the number of workers, but the decline is more marked in the Survey Area than in Great Britain.

The following table shows the incidence of unemployment in the industry in the Survey Area, and in Great Britain and Northern Ireland, as measured by the unemployment figures in June each year :—

Year.	Survey Area.					Gt. Britain and Northern Ireland. Percentage Unemployed.
	No. of Persons Insured.	Index No. 1924=100.	No. of Persons employed.	Index No. 1924=100.	Percentage Unemployed.	
1923...	1,190	92	1,060	100	10.9	11.6
1924...	1,290	100	1,058	100	18.0	10.1
1927...	960	74	822	78	14.4	7.4
1929...	1,050	81	933	88	11.1	8.7
1930...	1,010	78	805	76	20.3	13.3
1931...	1,020	79	748	71	26.7	20.4

The percentage unemployed is greater, in spite of the greater decline in the number of workers attached to the industry, in the Survey Area than in the rest of the country. Moreover it is to be noticed that the unemployment percentage among men and women workers in the industry seems to vary considerably, possibly due to the fact that the activity in the two sections of the industry, in one of which men are chiefly employed, and in the other, women, is not co-incident. This divergence of unemployment is shown in the following table :—

Year.	Percentage Unemployment (Survey Area).		
	Male Workers.	Female Workers.	Total Workers.
1923	12.5	7.2	10.9
1924	7.0	43.4	18.0
1927	15.9	8.5	14.4
1929	10.4	13.6	11.1
1930	15.9	31.8	20.3
1931	28.1	23.2	26.7

We find that the leather bag factory, previously referred to, whilst it gets a few skins from local leather works, gets the bulk of them from outside the Area. Those prepared within the Area are not quite the kind of leather required. If the making of leather goods could be developed further in the Area it would encourage the development of leather dressing.

(vi) **Metal Mining and Metal Manufactures :—**
Lead, Copper, Wire Ropes, etc.

The group of industries considered in this section is a miscellaneous one, and comprises both extractive and manufacturing processes.

There were in this group of industries in the Survey Area 5,160 insured workers in both 1924 and 1929, forming 7.5 per cent. of the total insured workers in this group in Great Britain in 1924, and 7.6 per cent. in 1929. These 5,160 persons were distributed as follows :—

Lead, Tin, and Copper Mining	360 equal to 6.6 per cent. of the whole Industry.
Brass, Copper, Zinc, Tin, Lead, etc., Manufacture.	2,780 equal to 6.9 per cent. of the whole Industry.
Wire, Wire Netting, and Wire Ropes ...	2,020 equal to 9.1 per cent. of the whole Industry.

It may, further, be noticed that of the 2,020 engaged in the last named section 45 per cent. were in Gateshead (350) and Middlesbrough (550).

The number of insured workers in these metal industries formed 7.3 per 1,000 of the total insured population in the Survey Area in 1924, and 7.5 per 1,000 in 1929; the proportions in Great Britain being 6.1 per 1,000 in 1924, and 5.7 per 1,000 in 1929.

This group of industries is, as one might expect, carried on chiefly by male labour, the proportions both in the Survey Area and in Great Britain being about 88 per cent. males and 12 per cent. females in 1924, and 90 per cent. males and 10 per cent. females in 1929. But the females form a distinctly higher proportion of insured women workers in the Survey Area than they do in the country as a whole, being 7.7 per 1,000 in 1924, and 5.8 per 1,000 in 1929, whilst the corresponding figures for Great Britain are 2.6 and 2.2 per 1,000.

The following table, compiled from information supplied by the Ministry of Labour from the exchange of Unemployment books in July each year, gives the numbers of insured workers in this group of industries in the Survey Area :—

Year.	Men.	Boys.	Total Males.	Women.	Girls.	Total Females.	Total Persons.	Index No. 1924=100.	Index No. for Great Britain 1924=100.
1923 ...	4,750	200	4,950	640	40	680	5,630	109	103
1924 ...	4,350	190	4,540	600	20	620	5,160	100	100
1927 ...	4,310	200	4,510	530	40	570	5,080	98	95
1929 ...	4,460	190	4,650	470	40	510	5,160	100	98
1930 ...	4,290	200	4,490	540	50	590	5,080	98	98
1931 ...	3,920	200	4,120	470	40	510	4,630	90	95

The changes in the number of insured workers are very similar in the Survey Area and in Great Britain.

The following table gives the number of persons attached to the industry who were unemployed at approximately the same date in June each year :—

Year.	Survey Area.		Great Britain and Northern Ireland.	
	Numbers.	Percentages.	Numbers.	Percentages.
1923 ...	784	13.9	—	—
1924 ...	765	14.8	7,976	11.5
1927 ...	963	19.0	7,884	11.9
1929 ...	700	13.6	6,532	9.6
1930 ...	1,400	27.6	12,076	17.8
1931 ...	1,916	41.4	21,089	32.0

It is clear that 1924 and 1929 were relatively good years for these industries, but the change for the worse in 1930 is very marked, both in the Survey Area and in Great Britain and Northern Ireland.

Lead Mining in the upper reaches of the Wear and Tees appears to have been in an unprosperous condition, and some mines have had to be closed down. Tyneside is the principal centre of the lead manufacturing industry in the Survey Area. Four companies on Tyneside employed in 1930 about 500 fewer workers than in 1926; and altogether there appeared to be about 700 fewer workers in this branch of the industry than there were in 1925-6. One of the explanations given for the unfavourable position of one company was that it had been forced to discontinue the processes of de-silverising and refining of lead owing to the increasing tendency of foreign producers of the raw materials to undertake these operations themselves. It is possible, too, that combination among the lead manufacturing firms of the country has led to the transference of part of their work to centres outside the Survey Area.

In Copper manufacture the principal firm on Tyneside employed in 1930 some 140 more workers than it did in 1926, though the progress between 1926 and 1930 had been gradual. Another Tyneside firm appears to be declining, owing, possibly, to its plant not being quite up-to-date, which makes it difficult to produce economically.

The production of Wire and Rope (including Hemp Rope, which really comes under the textile industries) in the Survey Area appears to have been considerably affected by the activities of a National Combine in the industry which in 1928-1929 embarked on a scheme of rationalization and took over the control of about 30 wire and rope factories throughout the country. As a result of this scheme one works at Sunderland and one at Newcastle were closed down. Another works at Sunderland had the bulk of its wire rope work transferred to Gateshead, whilst retaining its hemp rope section, which has shown increased activity between 1926 and 1930. One firm at Gateshead employed about 180 fewer workers in 1930 than in 1925-1926, owing to the re-distribution of work by the Combine.

Outside the Combine there has been a gradual increase in activity in one Darlington wire works, whilst the largest firm of rope-makers on Tyneside, though it has reduced the numbers of its workers, has maintained a steady level of employment for those remaining, owing to improved methods of production, though the orders obtained have been carried out at a low margin of profit. On the other hand a hemp rope firm at Dunston has worked very irregularly during this period. A wire manufacturing firm at Middlesbrough has commenced a subsidiary business for the production of hollow steel floors.

A firm of wire mattress makers at Blaydon, which started in 1927 on a small scale, employed in 1930 110 workers, whilst a firm at Newcastle employed 50 more workers than it did in 1925-1926.

(vii) **Saw Milling, Furniture Making, and General Woodwork.**

The magnitude of the industries dealt with in this section in the Survey Area is indicated by the fact that the number of insured workers in the industry was about 5,730 in 1924, and rose to 6,670 in 1929. These numbers form about 3 per cent. and 3.1 per cent. respectively of the number of insured workers attached to these industries in Great Britain as a whole.

In 1924 the number of insured workers in these industries was about 8.1 per 1,000 of the total insured population in the Survey Area. This proportion, however, rose to about 9.7 per 1,000 in 1929. This would seem to indicate that these industries have been expanding in the Area of recent years. But they are still of considerably less importance than in the country as a whole; the proportion in Great Britain being about 16.8 per 1,000 in 1924 and 17.9 per 1,000 in 1929.

The distribution of the 6,670 workers in the different branches of the industries in 1929 was as follows:—

Saw-Milling and Machined Woodwork	...	...	...	...	2,780
Furniture Making, Upholstering, etc.	...	...	...	...	3,400
Wood Boxes and Packing Cases	...	...	...	...	90
Woodworking, not separately specified	...	...	...	...	400

In the industries considered as a whole the labour employed is predominantly male labour. In 1924, of the insured workers 89 per cent. were male and 11 per cent. female workers. In 1929 the percentages were 87 and 13 respectively; whilst in Great Britain the percentages in both years were 85 and 15. As a field for the employment of female labour it may be noted that in 1924 in the Survey Area about 8.1 per 1,000 of the insured women workers in all industries were attached to the industries under consideration; whilst in 1929 the proportion had risen to 9.9 per 1,000. The proportion in Great Britain was about 9.6 per 1,000 in 1924, and about 9.8 per 1,000 in 1929.

The following table, extracted from statistics specially compiled by the Ministry of Labour from the exchange of Unemployment books in July each year, gives the numbers of insured workers attached to the industry in the Survey Area:—

Year.	Men.	Boys.	Total			Total Females.	Total Persons.	Index No. 1924=100.
			Males.	Women.	Girls.			
1923 ...	4,470	570	5,040	620	110	730	5,770	101
1924 ...	4,620	460	5,080	540	110	650	5,730	100
1927 ...	5,010	740	5,750	660	120	780	6,530	114
1929 ...	5,110	690	5,800	740	130	870	6,670	116
1930 ...	5,230	840	6,070	800	190	990	7,060	123
1931 ...	5,570	850	6,420	800	170	970	7,390	129

There has, therefore, been a steady increase in the number of workers since 1923. If we compare this increase with the increase in these industries in Great Britain we find that it is appreciably greater, the corresponding index numbers for Great Britain

being 98 in 1923, 100 in 1924, 104 in 1927, 110 in 1929, 112 in 1930, and 116 in 1931. The percentage increase over the period was much larger in the Survey Area than in Great Britain.

The following table gives the numbers and percentages of persons in these industries unemployed at about the same date in June each year.

Year.	Survey Area.		Gt. Britain and Northern Ireland.	
	Numbers.	Percentages.	Numbers.	Percentages.
1923	709	12·3	—	—
1924	525	9·2	15,726	8·1
1927	784	12·0	12,312	6·1
1929	744	11·2	15,368	7·2
1930	1,035	14·6	24,699	11·3
1931	1,527	20·7	40,707	18·0

These figures considered in conjunction with those in the preceding table would seem to indicate that the growth in the number of workers in the Area attached to the industries has been in excess of their real needs, and hence we get an unemployment percentage greater than that for the country as a whole. We are inclined to feel, therefore, that there is a surplus of somewhere about 700 persons attached to this group of industries.

We have very little information in respect of changes in this group of industries in the period under review. A few new works have been started in the Area in recent years, the chief one of which we have information being a wholesale cabinet making works at Walker-on-Tyne, which was started in 1926 and employs about 100 men.

The furniture making and upholstery trades seem to have profited by the increasing adoption of the extended credit system of trading; whilst it is highly probable that progress in house building has contributed in no small degree to increased activity in the furniture trades.

(viii) The Fishing Industry.

Since full information as to the position of the fishing industry is already possessed by the Ministry of Agriculture and Fisheries, we have not made any detailed investigation of the industry in the Survey Area. The following memorandum has been prepared, therefore, solely in order to give those engaged in the Survey an idea of the importance of the industry within the Area itself, and in relation to the industry of the country as a whole.

The most important fishing port in the Survey Area is North Shields, but Berwick, Seahouses, Blyth, and Hartlepool are also important centres of the fishing industry.

So far as our information goes it would appear that the industry has expanded somewhat in recent years. Thus at North Shields the number of steam fishing vessels has increased from 49 in 1926

to 61 in 1930. The weight of fish landed at the port has also increased, being 14,750 tons of wet fish in 1926; 17,370 tons in 1927; 16,700 tons in 1928; and 17,318 tons in 1929.

In 1924 there were 970 persons engaged in the industry in the Survey Area, and the number had risen to 1,130 in 1929 and 1,140 in 1930. They formed in 1924 1.4 per 1,000, and in 1929 1.6 per 1,000 of the total insured population of the Survey Area; whilst those engaged in the industry in Great Britain formed in both years 2.3 per 1,000 of the total insured population of the country as a whole. It would appear, therefore, though on quite general grounds, that there should be room for a further expansion of this industry on the North East Coast. But though the total number engaged in the industry in the Survey Area has risen, so also has the percentage unemployment since 1924.

In 1924 the Survey Area had 3.7 per cent., and in 1929 4.1 per cent. of the total number of workers in the industry in Great Britain.

The returns of 1924 show that no women were engaged in the industry in the Survey Area and in 1929 only 10; whilst in Great Britain in 1924 2.2 per cent. of the workers were females, and in 1929 3.6 per cent.

The following table, compiled from information furnished by the Ministry of Labour from the exchange of Unemployment books in July each year, and from the numbers unemployed at about the same date in June each year, shows the changes in the number of insured persons attached to the industry in the Survey Area and the numbers and percentages unemployed.

Year.	Total Insured Persons Survey Area.	Index No.	Index No.	Numbers Unemployed Survey Area.	Percentage Unemployed.	
		Survey Area 1924=100.	Great Britain 1924=100.		Survey Area.	Great Britain and Northern Ireland.
1923 ...	810	84	94	139	17.2	9.6
1924 ...	970	100	100	124	12.8	10.8
1927 ...	1,110	114	105	164	14.8	11.2
1929 ...	1,130	116	106	178	15.8	8.2
1930 ...	1,140	117	107	234	20.5	10.1
1931 ...	1,160	120	118	377	32.5	14.9

It will be seen that the numbers attached to the industry have grown proportionately more in the Survey Area than in Great Britain until the period 1930-1931, but that the percentage unemployment in June 1930 was twice as great in the Area as it was in the country as a whole.

(ix) Commerce, Banking, Insurance, and Finance.

It is necessary to emphasise that this memorandum deals not with the total numbers of those engaged in this group of businesses in the Survey Area, but solely with that section of them who are included in the scope of the Unemployment Insurance Acts.

The number of insured workers in the group in the Survey Area was 3,190 in 1924 and 2,840 in 1929. They formed in 1924 1.4 per cent. and in 1929 1.3 per cent. of the total number of insured workers in the group in Great Britain; or put in another way they formed in 1924 4.5 per 1,000, and in 1929 4.1 per 1,000 of the insured workers of the Survey Area; the corresponding figures for Great Britain being 19.5 and 19.1 per 1,000 respectively. Out of the 2,840 in 1929 no less than 1,220, or 43 per cent. were in the Newcastle Exchange area.

In 1924, 60 per cent. of the insured workers in the group in the Area were males, and 40 per cent. females, but these proportions had altered by 1929 when they were 65 and 35 per cent. respectively. In Great Britain the proportion of males was slightly higher, being 66 per cent. in 1924 and 68 per cent. in 1929. The figures also show that relatively to other employments for women, the women workers in this group had lost ground. In 1924 the proportion of women was 16.1 per 1,000 of the total of insured female workers in the Area. In 1929 it had fallen to 11.3 per 1,000. A similar, though smaller, change is found in Great Britain where the number fell from 25.3 to 22.5 per 1,000.

The following table, extracted from figures compiled by the Ministry of Labour from the exchange of Unemployment books in July each year, gives the number of insured workers in the group in the Survey Area:—

Year.	Men.	Boys.	Total Males.	Women.	Girls.	Total Females.	Total Persons.	Index No. 1924=100.	Great Britain Index No. 1924=100.
1923 ...	2,510	590	2,900	1,510	240	1,750	4,650	146	101
1924 ...	1,710	190	1,900	1,140	150	1,290	3,190	100	100
1927 ...	1,540	150	1,690	980	120	1,100	2,790	87	98
1929 ...	1,860	180	1,840	860	140	1,000	2,840	89	101
1930 ...	1,540	190	1,730	910	220	1,130	2,860	89	103
1931 ...	1,630	190	1,820	790	190	980	2,800	88	105

The contraction in the number of insured workers in the Survey Area since 1923 is marked, especially as between 1923 and 1924. The movement in the Area differs from that in the country as a whole, where the numbers have been slightly on the increase.

The following table gives the numbers working and the percentage unemployment, as measured by the figures of the Ministry of Labour in June each year:—

Year.	Survey Area.				Gt. Britain and Northern Ireland	
	No. Insured.	Index No. 1924=100.	No. Employed.	Index No. 1924=100.	Percentage Unemployed.	Percentage Unemployed.
1923 ...	4,650	146	4,369	151	6.0	4.4
1924 ...	3,190	100	2,886	100	9.5	3.9
1927 ...	2,790	87	2,531	88	9.3	2.2
1929 ...	2,840	89	2,640	91	7.0	2.5
1930 ...	2,860	89	2,577	89	9.9	3.5
1931 ...	2,800	88	2,394	83	14.5	5.4

In spite of the considerable fall in the number of insured workers in this group the percentage unemployment among them in the Survey Area is much higher than in the rest of the country.

In such a composite group it is impossible to trace out the causes of the changes revealed in the above tables. A detailed investigation would be necessary. To a considerable extent it may be due to the increased use of devices to reduce the labour cost of office work, such as the mechanical devices for the keeping of accounts now being installed by many, if not most, banks.

(x) Laundries, Dyeing, and Dry Cleaning Industries.

The relative importance of this group of occupations in the Survey Area may be gauged from the fact that the number of insured persons in them in 1924 was 3,070, and 3,300 in 1929. In 1924 they formed 4.4 per 1,000 insured persons in the Area, and in 1929 4.8 per 1,000; whereas the proportion in Great Britain was more than twice as large, being 9.7 per 1,000 in 1924, and 11.3 per 1,000 in 1929. The numbers in the Survey Area formed 2.8 per cent. in 1924, and 2.5 per cent. in 1929 of the total number in this group in Great Britain. Relatively, therefore, this group of industries is much less important in the Survey Area than it is in the country as a whole.

It is, as might be expected, predominantly a women's group of industries. In the Survey Area in 1924 of the total number of insured workers in the group 20 per cent. were males and 80 per cent. were females; in 1929 23 per cent. were males and 77 per cent. females. A similar slight increase in the proportion of males is seen in the corresponding figures for Great Britain, which in 1924 were 19 per cent. males and 81 per cent. females, and in 1929 21 per cent. and 79 per cent. respectively. In the Survey Area in 1924 the industries included 30.5 per 1,000 of the total of insured female workers; in 1929 the proportion had fallen to 28.8 per 1,000. The proportion in Great Britain is very similar, but with an increase, instead of a decrease in 1929, the actual figures being 30.3 per 1,000 in 1924 and 32.4 per 1,000 in 1929.

The following table, extracted from figures compiled by the Ministry of Labour from the exchange of Unemployment books in July each year, gives the number of insured workers in the group in the Survey Area:—

Year.	Men.	Boys.	Total Males.	Women.	Girls.	Total Females.	Survey Area.		Great Britain.	
							Total Persons.	Index No. 1924=100.	Total Persons.	Index No. 1924=100.
1923...	650	90	740	1,690	370	2,060	2,800	91	104,810	94
1924...	530	90	620	2,100	350	2,450	3,070	100	111,290	100
1927...	660	100	760	2,020	420	2,440	3,200	104	122,090	110
1929...	650	110	760	2,040	500	2,540	3,300	108	132,870	119
1930...	640	140	780	2,250	580	2,830	3,610	118	138,310	124
1931...	750	140	890	2,260	640	2,900	3,790	123	140,490	132

Both in the Survey Area and in Great Britain the number of insured workers increased steadily between 1923 and 1930, but the proportionate increase in Great Britain was greater than in the Survey Area.

The following table shows the incidence of unemployment in the group in the Survey Area and in Great Britain and Northern Ireland, as measured by the unemployment figures in June each year :—

Year.	No. of Persons Insured.	Index No. 1924= 100.	Survey Area.		Percentage Unemployed.	Gt. Britain and Northern Ireland. Percentage Unemployed.
			No. of Persons Employed.	Index No. 1924= 100.		
1923 ...	2,800	91	2,592	90	7.4	5.1
1924 ...	3,070	100	2,872	100	6.4	5.5
1927 ...	3,200	104	3,007	105	6.0	3.3
1929 ...	3,300	108	3,090	108	6.4	3.5
1930 ...	3,610	118	3,255	113	9.8	6.1
1931 ...	3,790	123	3,288	114	13.2	9.2

There seems some evidence to support the view that the numbers employed in this group of industries increased considerably either during the War, or in the immediate post-war boom, but that in the slump of 1921-1922 the numbers fell, owing to the high charges for laundry services. The laundries however met the situation to a considerable extent by a reorganization of methods and the installation of more efficient equipment. Since 1923, the demand for laundry services appears to have been increasing, and the varied services provided by laundries in certain cases to be superseding "home-washing."

(xi) Hotel, Boarding-House, Club, etc., Service.

The total number of insured persons in this group in the Survey Area was 10,990 in 1924, 13,460 in 1929, and 15,120 in 1930. Of the numbers in 1929 no less than 4,170, or 31 per cent., were in the Newcastle Employment Exchange area. In 1924 they formed 15.6 per 1,000 of the total insured population of the Survey Area, and the proportion rose in 1929 to 19.5 per 1,000. These proportions are, however, considerably less than for Great Britain, where they were 24.3 per 1,000 in 1924, and 27.9 per 1,000 in 1929.

The insured persons in this group in the Survey Area in 1924 formed 4.0 per cent., and in 1929 4.1 per cent. of the total number of insured workers in the group in Great Britain.

In 1924, 30 per cent. of the workers were males, and 70 per cent. females; whilst in 1929 the proportions were 29 and 71 per cent. respectively. The proportion of male workers is thus considerably lower than in Great Britain, where the proportions in both years were 36 and 64 per cent. respectively.

This group of services is, therefore, of considerable importance as a field of employment for female workers, since about one in every ten insured female workers in the Survey Area is engaged in it. The actual proportions are 95.5 per 1,000 in 1924, and 108 per 1,000 in 1929. The proportions in Great Britain are much lower, being 59.4 per 1,000 in 1924 and 64.7 per 1,000 in 1929. This is partly due to the fact that the proportion of women workers to total population in the Survey Area is much lower than in Great Britain.

The following table, extracted from returns of the Ministry of Labour compiled from the exchange of Unemployment books in July each year, gives for the Survey Area the numbers of insured workers in the group of services :—

Year.	Men.	Boys.	Total Males.	Women.	Girls.	Total Females.	Total Persons.	Survey Area Index No. 1924=100.	Great Britain Index No. 1924=100.
1923 ...	3,150	150	3,300	6,550	630	7,180	10,480	95	93
1924 ...	3,220	110	3,330	7,000	660	7,660	10,990	100	100
1927 ...	3,570	150	3,720	7,970	680	8,650	12,370	113	109
1929 ...	3,690	200	3,890	8,650	920	9,570	13,460	123	119
1930 ...	4,060	210	4,270	9,820	1,030	10,850	15,120	137	125
1931 ...	4,420	210	4,630	10,800	930	11,730	16,360	149	137

There has, therefore, been a steady and considerable increase in the total number of persons attached to the industry, the increase between 1924 and 1930 being no less than 37 per cent. But the increase in the number actually in employment as between June, 1924, and June, 1930, is only 22 per cent. We have, therefore, here yet another instance of an increase in the numbers attached to an industry or occupation, accompanied by an increase of unemployment. Moreover, it is seen that the increase between 1924 and 1930 in the numbers attached to the group in the Survey Area is much greater than the increase in Great Britain, being 37 per cent. as compared with 25 per cent.

The following table gives the numbers of persons and percentages in this group in the Survey Area unemployed in June each year :—

Year.	Survey Area.		Great Britain and Northern Ireland.
	Numbers.	Percentages.	Percentage.
1923 ...	1,229	11.7	9.9
1924 ...	1,200	11.5	9.5
1927 ...	1,289	10.4	5.9
1929 ...	1,523	11.3	6.5
1930 ...	3,198	21.2	11.3
1931 ...	4,100	25.1	15.3

The percentage has more than doubled in the Survey Area and the increase is much greater than the increase in Great Britain and Northern Ireland.

We also see that in 1930 as compared with 1929 the increase in the number of persons attached to the industry was 1,660; whilst the increase in the number of persons unemployed was 1,675. There would seem to be, therefore, unneeded recruitment in the group in the last two years, due, possibly, to replacement of older by younger workers; possibly to lack of mobility of this kind of labour from one place to another; possibly to the fact that the flow of labour into and out of the group is comparatively easy from and to other occupations. A fuller use of the Employment Exchanges in the filling of vacancies should do much to remedy this state of things.

(xii) **Other Manufacturing Industries and Industries and Services not separately specified.**

The chief manufacturing industries included in this miscellaneous group carried on in the Area are rubber, brush and broom, scientific and photographic apparatus, musical instruments and toys, games, and sports requisites.

The number of insured workers in the whole group was 3,920 in 1924 and 4,690 in 1929, forming 1.6 and 1.7 per cent. respectively of the total number of insured workers in these industries in Great Britain. In "Other Manufacturing Industries" alone the proportion in 1929 was only 0.6 per cent.; whilst that in "Industries and Services not separately specified" was 3.1 per cent.

Of the 4,690 insured persons in the whole group in the Survey Area in 1929 the numbers insured in the different branches were as follows:—

Rubber	...	...	...	...	...	...	...	...	70
Brushes and Brooms	...	...	...	...	...	...	...	...	140
Scientific and Photographic Apparatus	...	...	...	...	...	...	...	...	160
Musical Instruments	...	...	...	...	...	...	...	...	190
Toys, Games and Sports Requisites	...	...	...	...	...	...	...	...	300
									<hr/>
Total "Other Manufacturing Industries"	...	...	...	...	...	...	...	...	860
									<hr/>
Industries and Services not separately specified	...	...	...	...	...	...	...	...	3,830

In 1924 the number insured in the group was 5.6 per 1,000, and in 1929 6.8 per 1,000 of the total insured population of the Area.

But the proportion in Great Britain was much greater, being 21.2 in 1924 and 23.7 per 1,000 in 1929. The percentage of males in this group in the Area is, however, greater than in Great Britain, being 82 per cent. in 1924, and 81 per cent. in 1929, as against 68 per cent. in both years for Great Britain.

The number of females in the group was in 1924 8.7 per 1,000 and in 1929 10.1 per 1,000 of the total of insured female workers in the Area; the corresponding proportions in Great Britain being 25.8 and 27.9 per 1,000.

The following table, extracted from figures compiled by the Ministry of Labour from the exchange of Unemployment books in July each year, gives the numbers of insured workers in the group in the Survey Area :—

Year.	Men.	Boys.	Total Males.	Women.	Girls.	Total Females.	Total Persons.	Index No. 1924=100.	Great Britain Index No. 1924=100.
1923 ...	2,120	250	2,370	730	150	880	3,250	83	96
1924 ...	2,880	340	3,220	580	120	700	3,920	100	100
1927 ...	4,070	330	4,400	720	160	880	5,280	135	108
1929 ...	3,540	260	3,800	740	150	890	4,690	120	115
1930 ...	3,510	200	3,710	510	90	600	4,310	110	119
1931 ...	4,640	280	4,920	890	220	1,110	6,030	154	123

The result would seem to show that there has been a greater proportionate increase of these industries and services, too small to be classified, in the Survey Area than in the rest of the country.

The following table gives the numbers working and percentages unemployed, as compiled by the Ministry of Labour for a date in June each year :—

Year.	Survey Area.					Gt. Britain and N. Ireland. Percentage Unemployed.
	Number Insured.	Index No. 1924=100.	No. Employed.	Index No. 1924=100.	Percentage Unemployed.	
1923...	3,250	83	2,362	85	27.3	—
1924...	3,920	100	2,771	100	29.3	16.7
1927...	5,280	135	3,603	130	31.8	12.1
1929...	4,690	120	2,892	104	33.3	11.8
1930...	4,310	110	2,761	100	35.9	18.5
1931...	6,030	154	2,534	91	58.0	25.2

It will be noted that the unemployment percentage is remarkably high in the Survey Area; and much higher than in the rest of the country.

XII (a).—TRANSPORT (INCLUDING THE SHIPPING INDUSTRY).

(Memorandum by Mr. C. S. McLeod and Professor H. M. Hallsworth.)

(i) Introduction.

In this memorandum the present position of the transport agencies (shipping, rail, and road) on the North East Coast is compared with that in previous years. The principal questions discussed are (1) how the volume of goods offered for transport has altered, (2) what transference there has been from one mode of transport to another, and (3) what has been and may be expected to be the effect on the capacity of these agencies for employing labour of any changes in the total volume of goods carried or in the proportion carried by each agency.

(ii) Shipping.

In an enquiry into the position of the Shipping Industry on the North East Coast, we meet the difficulty that North East shipowners engage not only in trade from North East ports but to a certain extent in the carrying trade of the world. Unfortunately for our purpose it is impossible to obtain a measure of the two branches of their activities. Further, a certain amount of the trade to and from the North East ports is undertaken by other than North East shipowners, and it is impossible to measure this part of the trade also.

Two enquiries can however be made. First, what is the position of world trade, the trade of the United Kingdom, and the trade of the North East ports to-day as compared with the last ten years or so; and, second, what is the position of shipping on the North East Coast as an industry.

(a) *The Trade of the World, the United Kingdom, and the North East Coast Ports.*

If we base our estimates of the expansion of world trade on the calculations made in the League of Nations Memoranda on International Trade, 1913 to 1927, Volume (1), and 1927 to 1929, Volume (1), we arrive at the following approximate representation of the trade of the world reduced to 1913 prices and expressed in millions of dollars:—

1913	38,000	1928	46,000
1926	42,000	1929	48,000
1927	45,000		

This increase may be partly fictitious, since the birth of new political states as a consequence of the War has made additions to international trade statistics which correspond to no real increase in transport. Sir A. M. Sutherland is quoted in the Glasgow Herald

Annual Supplement, published on 30th December, 1930, as saying that he doubted whether International Trade had increased by more than 10-15 per cent. between 1914 and 1930. On the other hand Loveday, in "Britain and World Trade," estimates the increase between 1913 and 1928 at 23 per cent.

It is possible that the statistics of vessels passing through the Suez and Panama Canals may give some indication of the changes in volume of international trade. The two following tables show the net tonnage of vessels, British and foreign, passing through these canals in recent years:—

Net Tonnage of Vessels, British and foreign, passing through Suez Canal—Prepared from Annual Reports of Chamber of Shipping.

<i>Years.</i>	<i>British:</i>	<i>Foreign.</i>	<i>Total.</i>	<i>Percentage British.</i>
1910-1913—				
Total ...	47,040,000	28,176,000	75,216,000	—
Average ...	11,760,000	7,044,000	18,804,000	62·5
1923 ...	14,264,000	8,466,000	22,730,000	62·8
1924 ...	14,995,000	10,115,000	25,110,000	59·7
1925 ...	16,016,000	10,746,000	26,762,000	59·8
1926 ...	14,969,000	11,091,000	26,060,000	57·4
1927 ...	16,534,000	12,428,000	28,962,000	57·1
1928 ...	18,124,000	13,782,000	31,906,000	56·8
1929 ...	19,114,000	14,352,000	33,466,000	57·1
1930 ...	17,600,000	14,069,000	31,669,000	55·6
1923-26—				
Total ...	60,244,000	40,418,000	100,662,000	—
Average ...	15,061,000	10,104,500	25,165,500	59·8
1927-30—				
Total ...	71,372,000	54,631,000	126,003,000	—
Average ...	17,843,000	13,657,750	31,500,750	56·6

Number of Vessels passing through the Panama Canal during years ended June 30—Prepared from Annual Reports of Chamber of Shipping.

<i>Year.</i>	<i>British.</i>	<i>Total.</i>	<i>Percentage British.</i>
1915 ...	465	1,075	43·3
1923 ...	1,065	3,967	26·8
1924 ...	1,265	5,230	24·2
1925 ...	1,211	4,673	25·9
1926 ...	1,423	5,197	27·4
1927 ...	1,351	5,475	24·7
1928 ...	1,842	6,456	28·5
1929 ...	1,783	6,413	27·8
1930 ...	1,535	6,185	24·8
1923-1926—			
Total ...	4,964	19,067	—
Average ...	1,241	4,767	26·0
1927-1930—			
Total ...	6,512	24,529	—
Average ...	1,628	6,132	26·5

It will be seen that the average net tonnage of vessels passing through the Suez Canal rose from an annual average of 18,804,000 tons in the period 1910-1913, to 25,165,500 tons in the period 1923-1926, and to 31,500,750 tons in the period 1927-1930. The percentage increases in the two latter periods, compared with 1910-1913 are, therefore, 33.8 and 67.5 respectively.

In the case of the Panama Canal, the number of vessels passing through the Canal rose from 1,075 in 1915 to 6,185 in 1930; or from an average number of 4,767 in the period 1923-1926 to an average of 6,132 in the period 1927-1930.

It is possible, that, owing to the fact that vessels are now frequently run with more vacant space than prior to the War, these figures are to that extent misleading as indices of world trade. Moreover, changes in the distribution of world trade will also affect these figures. Nevertheless, the figures do seem to indicate that the increase in world trade both since 1913 and 1923 or 1924 has been considerable, and make us feel that an increase of 10 to 15 per cent. is an underestimate. And it is impossible for us, as well as outside the scope of our enquiry, to make any reasoned estimate of the growth of world trade.

It is perhaps more important to indicate that not only is British shipping carrying a smaller proportion of this increased world trade but also that the trade of the United Kingdom forms a smaller percentage of the total. Thus while British shipping formed 62.5 per cent. of the tonnage passing through the Suez Canal in the period 1910-1913, it formed only 59.8 per cent. in the period 1923-26, and 56.5 per cent. in the period 1927-1930; whilst the proportion of British vessels using the Panama Canal was only 26.5 per cent. in 1927-1930 as compared with 43.2 per cent. in 1915.

As illustrating the fall in the proportion that the trade of the United Kingdom forms to that of the world, the following percentage figures taken from the League of Nations Memoranda cited above, may be quoted:—

		1913.	1926.	1927.	1928.	1929.
Imports	...	16.48	17.40	15.79	15.11	15.31
Exports	...	13.94	10.93	11.00	10.83	10.84
Total	...	15.25	14.28	13.48	13.04	13.16

The proportion of the overseas traffic of the United Kingdom dealt with at North East Coast ports is given in the following table which has been prepared from information contained in the Annual Statements of Trade for 1915, 1924, 1929, and 1930. No similar table can be prepared for coastwise traffic, but from the shipping tonnage figures, it will be shown later that coastwise general merchandise traffic besides being comparatively insignificant appears to have remained fairly constant since 1924.

Ports of Berwick, Blyth (including Amble), the Tyne, the Hartlepool, the Wear, and the Tees. Analysis of overseas trade, compared with that of the United Kingdom in 1913, 1924, 1929, and 1930. (See Appendix, Table 1, for further details).

	Percentage Tyne. U.K. 1913.	Percentage Tyne. U.K. 1914.	Percentage Tyne. U.K. 1929.	Percentage Tyne. U.K. 1930.
Imports.				
Food, Drink, Tobacco ...	2.68	2.84	3.01	2.91
Raw materials	2.80	2.32	2.19	2.43
Manufactured articles ...	1.04	0.03	1.32	1.16
Total including unclassified articles.	2.44	2.37	2.57	2.48
Exports.				
Food, Drink, and Tobacco ...	1.30	0.30	0.38	0.35
Coal and Coke	27.6	31.9	30.5	29.5
Raw materials (excluding coal)	1.94	2.41	2.17	2.54
Manufactured articles (excluding coke).	4.35	2.06	4.10	4.06
Total including unclassified articles.	6.50	5.66	5.68	6.63

An examination of the details of imports and exports reveals the following information explaining these figures, which should be read in conjunction with Appendix Tables 1 and 2 (A-12).

Imports.

Food, Drink, and Tobacco. (1930 = £13,861,000). There was a general increase between 1913 and 1924 in the quantity of food, drink, and tobacco imported. Decreases in imports of grain and flour, margarine, refined sugar, and meat in 1929 and 1930 as compared with 1924 are balanced by increases in Danish produce and Norwegian fish, and it is surprising to find that imports are generally increased or maintained in 1930 as compared with 1929 so far as quantity is concerned though the value has decreased owing to the fall in prices. At the same time there is a tendency for imports to be concentrated at Newcastle to the detriment of other ports—e.g. sugar, grain and flour. The Tyne imported 99 per cent. of the imports of food, drink, and tobacco on the North East Coast in 1930 as compared with 97 per cent. in 1924 and 88 per cent. in 1913.

Raw Materials and Unmanufactured Articles. (1930 = £6,102,000). The decrease between 1913 and the present period in the relative value of imports of raw materials appears to be due mainly to a decrease in iron ore and scrap and other ores. Iron ore and scrap decreased from 3,358,000 tons in 1913 to 2,479,000 tons in 1924, 2,545,000 tons in 1929 and 1,842,000

tons in 1930, the main decreases being at Hartlepool, Middlesbrough, and Stockton. Imports of timber showed little alteration between 1,238,000 loads in 1913 and 1,227,000 loads in 1924 but after 1924 there was a fall to 969,000 loads in 1929 and 970,000 loads in 1930. There is a tendency for less timber to be used in modern pits and this has had a marked effect on Durham ports. In 1925, W. Hartlepool imported 14.26 per cent. of all pit props entering the country, in 1929 only 9.45 per cent. Taken on the whole there appears to have been an actual fall in the imports of raw materials between 1929 and 1930—especially iron ore and scrap.

Manufactured Articles. (1930 = £3,573,000). Between 1913 and 1924 the actual quantity of imports of iron and steel manufactures rose almost 50 per cent. and imports of petroleum doubled, but only one-third of the pre-war imports of lead and zinc remained in 1924. Other commodities varied and in the sum the imports of manufactured articles on the N.E. Coast fell slightly from 1.04 per cent. to .93 per cent. as compared with those of the country as a whole.

The increase in such imports since 1924 on the Tyne and the Tees is shown by the following extract:—

	<i>Middlesbrough.</i>			<i>The Tyne.</i>		
	1924.	1929.	1930.	1924.	1929.	1930.
Iron and Steel, 1,000 tons ...	97	74	99	45	50	47
Lead and Zinc " ...	1	7	4	9	19	17
Machinery " ...	—	3	2	1	5	4
Jute " ...	—	8	4	—	—	—
Chemicals, £1,000 ...	—	22	36	70	112	128
Paper, 1,000 tons ...	—	3	1	9	11	12
Petroleum, 1,000 gallons ...	—	—	—	13,512	19,427	20,606

The total value of manufactured articles imported on the N.E. Coast increased from £2,775,000 in 1924 to £4,417,000 in 1929 and though it fell to £3,573,000 in 1930, a large part of the fall may be ascribed to the fall in price levels and the quantity of imports has been well maintained. That this increase since 1924 is greater comparatively than in the country as a whole is shown by the fact that the N.E. Coast ports imported 1.33 per cent. in 1929 and 1.16 per cent. in 1930 of the total value as against .93 per cent. in 1924, and though the increased trade is a satisfying feature so far as the well-being of the docks is concerned, its benefit to the Survey Area as a whole is questionable.

Total Imports. In 1913, £18.75 million of imports were dealt with at N.E. Coast ports; in 1924, the figure was £30.23 million; in 1929 it was £30.80 million and in 1930 it was £25.92 million, the sudden fall in 1930 being due more to the fall in price levels, especially in the case of food, than to an actual decrease in imports, though this has taken place in the case of raw materials.

Exports of British Produce and Manufactures.

Food, Drink, and Tobacco. (1930 = £173,000).—The significant fall from 1.36 per cent. in pre-war years to .30 per cent., .38 and

.35 per cent. in 1924, 1929, and 1930 in the proportion of food, drink, and tobacco exported from the North East Coast as compared with the United Kingdom is mainly due to decreased exports of herrings which have fallen away at all ports and disappeared altogether at Blyth and Hartlepool. Exports of other fish, grain, and salt also show steady decreases but trade in meat and spirits is being built up on the Tyne. A remarkable change is illustrated by the fact that, while in 1913 exports consisted of £291,000 of fish, £136,000 of grain, and £32,000 of salt, in 1930 they consisted of £70,000 of spirits, £46,000 of meat, £37,000 of fish, £19,000 of salt, and only £1,000 of grain.

Raw Materials and Unmanufactured Articles. (1930 = £304,000).—The predominant raw material exported is coal but as this commodity is fully dealt with elsewhere, no further discussion is required here. With regard to other raw materials, there was a decrease between 1913 and 1924, accompanied by a transfer in the case of wool from Hartlepool to Newcastle, in the exports of wool (1,674,000 lbs. to 994,000 lbs.), iron and steel scrap (15,000 tons to 9,000 tons), zinc ore (12,000 tons to nil) and stones and slates (10,000 tons to nil). The comparative position of the North East Coast ports was, however, more than maintained by new exports of coal tar pitch (89,000 tons) and by an increase in the value of hides and skins from £48,000 to £256,000. Since 1924, iron and steel scrap further declined to 5,000 tons in 1929 and 2,000 tons in 1930 and though the exports of coal tar pitch increased from 89,000 tons in 1924 to 116,000 tons in 1929 and 112,000 tons in 1930 the value diminished from £379,000 in 1924 to £225,000 in 1929 and £238,000 in 1930. The fall in the value of exports of raw materials between 1929 and 1930 is mainly due to decreased exports and falls in prices of rabbit skins, this being more significant if 1928 is included.

	<i>Number exported.</i>	<i>Value.</i>
		£
1928	8,168,619	306,432
1929	5,994,064	224,526
1930	3,454,490	72,232

Despite this decrease the North East Coast shows up better in 1930 as compared with the country as a whole than in any of the years under review.

Manufactured Articles. (1930 = £21,666,000).—Between 1913 and 1924 there were falls in exports of machinery (27,000 tons to 12,000 tons), ships and boats (222,000 gross tonnage to 39,000 gross tonnage), iron and steel manufactures (1,393,000 tons to 873,000 tons) and also in woollen manufactures and armaments. Increases are apparent in cotton piece goods and in railway equipment but these are not sufficient to prevent the percentage dealt with at North East Coast ports falling from 4.35 per cent.

to 2.96 per cent. Since 1924 the position of the North East Coast has been regained and, in fact, so far as value was concerned, exports of manufactured articles beat all records in 1929. The value of chemicals and manures rose from £1,800,000 in 1913 to £2,418,000 in 1924, £5,388,000 in 1929, and £4,201,000 in 1930, the decrease in 1930 being mainly due to a fall in the value per ton of ammonium sulphate, of which 451,000 tons at a value of £4,304,000 were exported in 1929 and 403,000 tons at a value of £3,105,000 in 1930. Iron and steel manufactures fell from 873,000 tons in 1924 to 838,000 tons in 1929 and 528,000 tons in 1930, the value falling from £8,760,000 in 1924 to £7,505,000 in 1929 and £4,593,000 in 1930, and it will therefore be seen that in this case the fall in 1930 is due mainly to a decreased actual export. Cotton and woollen manufactures also show decreases in 1929 and 1930 as compared with 1924. Turning to the bright side, the export of new ships to foreign countries was as follows:—

	<i>Gross Tonnage.</i>			<i>Value.</i>	
				£	
1913	222,000	3,518,000	
1924	39,000	970,000	
1929	201,000	5,028,000	
1930	337,000	8,048,000	

The extent to which these figures represent the true position of the shipbuilding industry in the specified years is treated in the shipbuilding section and is outside the scope of this memorandum, but it is important to notice that if we exclude these figures, the value of manufactured articles exported was £14,342,000 in 1913, £17,186,000 in 1924, £18,344,000 in 1929, and only £13,618,000 in 1930. Increased exports of chemicals and railway vehicles in 1929 compensated for the fall since 1924 in exports of iron and steel manufactures, and woollen and cotton goods, but, as is shown above, chemicals fell in value in 1930 accompanied by another sudden drop in iron and steel manufactures. Other exports also show decreases and the net result, excluding ships and boats, is that the North East Coast ports exported a smaller value of manufactured articles in 1930 than in 1913. It is due solely and simply to the value of ships and boats exported that the North East Coast shows up better in 1930 than it did in previous years.

Total Exports.—In 1913, £34.15 million of exports were dealt with at North East Coast ports, in 1924 the figure was £45.35 million, in 1929 it was £41.40 million, and in 1930 it was £37.81 million.

Summary of Trade of the North East Coast.—The general tendency of recent years has been for imports of food, drink, and tobacco, and of manufactured articles to increase,—the latter since

1924—and for imports of raw materials to decrease. Exports mainly consist of coal and coke, iron and steel manufactures, ships and boats, and chemicals. With the exception of ships and boats, which show exceptional increases in 1929 and 1930, exports are decreasing in value and in actual quantity though chemicals still show up well as compared with 1924. We find once again from these figures the dependence of the Survey Area on the coal and basic industries as expressed in the proportion formed by exports of coal and coke, iron and steel manufactures, and vehicles of all kinds. Any drop in the market for such commodities hits the Survey Area much more severely than the country as a whole, yet we find at the same time that there is little diminution in the imports of food, drink, and tobacco, and of manufactured articles. To these facts may be ascribed the fall in the trade balance at North East Coast ports from £15.12 million in 1924 to £10.60 million in 1929 and to £11.89 million in 1930. If one excludes the value of exports of ships and boats the balance fell from £14.15 million in 1924 to £5.57 million in 1929 and £3.84 million in 1930.

(b) Shipping dealt with at North East Coast Ports.

The volume of trade—that is the total weight of goods imported and exported—at North East Coast ports cannot be stated in exact terms since the weight is only available in the case of certain commodities, and even then it is given in terms of various units. In the case of coastwise trade, no official figures are available and the figures prepared privately by each port authority are not in such a form as to make it possible to arrive at a sum total. This is unfortunate, since the volume of trade is perhaps of more importance to the shipping industry than the value of the trade, though the latter is of importance to the Survey Area as a whole. But, though the volume of trade in any one year cannot be ascertained, comparisons can be made from one year to another of the tonnage of vessels arriving and departing with cargoes in the foreign and coastwise trades. These are shown in Tables 3 and 4 of the Appendix, and, as one might expect, the figures of vessels departing with cargoes bear a close correlation with the figures of coal shipments. We have been led from this fact to enquire what proportion of the shipping dealt with at North East Coast ports is directly concerned in the coal trade.

We thus examined the position at the Hartlepoons and Blyth (including Amble), both being ports at which the exports of general merchandise are negligible, and found that the tons of coal shipped per net tonnage of vessels departing with cargoes showed only slight variations over several years from 2.3 tons in the case of foreign shipments and 2.4 tons in that of coastwise shipments. Applying these factors to the foreign and coastwise shipments of coal and of

coke at all North East Coast ports, the following figures were obtained :—

	Foreign trade.		Coastwise trade.	
	Net Tonnage of vessels departing with cargoes.	Estimated Net Tonnage required to carry coal and coke.	Net Tonnage of vessels departing with cargoes.	Estimated Net Tonnage required to carry coal and coke.
	Million tons.		Million tons.	
1924 ...	12·52	9·74	3·73	3·27
1929 ...	12·51	9·64	5·18	4·75
1930 ...	11·12	8·65	5·00	4·51

This table, which is amplified in Table 5, emphasizes that the shipping tonnage using the North East Coast ports and the employment capacity of these ports depend to a very large extent on the state of the coal export trade and rise or fall with it. In 1930, 40 per cent. (46 per cent. in 1924) of all vessels departing from North East Coast ports carried coal and coke in the foreign trade, 21 per cent. (15 per cent. in 1924) in the coastwise trade—i.e. in both years 61 per cent. in all. In both years approximately 15 per cent. left with general cargoes and 24 per cent. left in ballast. If one compares this with the position for all the United Kingdom ports, from which only 19 per cent. depart with coal and coke while 39 per cent. depart with general cargoes, the comparative importance of coal shipments to the North East Coast ports is strikingly illustrated. It is also shown by the fact that while in the United Kingdom as a whole only 44 per cent. of all incoming vessels arrive in ballast, at North East Coast ports the corresponding figure is 82 per cent.

We were hopeful that at the same time we could use the figures of tonnage not directly concerned in the coal trade, which could be obtained by the process of subtraction, as a measure of the volume of trade dealt with, but in view of the small dimensions of the figures, especially in the case of coastwise trade, it was felt that any faults in the assumptions underlying the estimates would have serious consequences. It was thus found impossible to proceed beyond the general conclusion that coastwise general merchandise trade is almost negligible, and that the general merchandise trade as a whole expanded up to 1929 with a set-back since. This supports the view held on the Tyne that improvements in general trade follow improvements in the coal trade—in other words, a good coal year means a good general merchandise year, and vice versa.

(c) The Shipping Industry.

We have shown how largely the North East Coast ports depend on the coal export trade. We feel that to a very large extent the same is true of the shipping industry of the North East Area. For, if we except a few firms engaged in coastwise trade or in general "tramp" shipping, the majority of the firms and the bulk of the shipping, locally owned, are normally engaged in the coal export trade.

An analysis of "Fairplay's" Annual Summary of British Shipping Finance for 1931 shows that there are 87 ship-owning firms whose main offices are situated in the Survey Area. These firms together own 449 vessels of a total gross tonnage of 1,471,302—which gives an average of 3,277 gross tons per ship—and the ships are of an average age of 10 years. But only 18 of these firms own seven or more vessels, and the great majority of them appear to own from one to four colliers. The largest firm owns 29 vessels of a total tonnage of 139,223; and the second largest 23 vessels of a total tonnage of 106,107.

The total tonnage of shipping owned in the United Kingdom in 1930 was 20,438,444 gross tons, of which, therefore, over 7 per cent. belonged to firms in the Survey Area. This compares very favourably with the percentage of the trade of the whole country dealt with at North East ports; but not so favourably with the proportion of vessels using these ports as compared with the ports of the United Kingdom as a whole.

The Demand for Shipping.—Changes in the demand for shipping may be seen in the movement of shipping freights. The following table gives the yearly index numbers of shipping freights, as calculated by the Chamber of Shipping. It is based on "tramp" freights for 27 routes in 1920 and 1921, and for 21 routes for 1922 and subsequent years; the 1920 average for each route is taken as 100 for the component parts and also for the routes as a whole.

Index Numbers of Shipping Freights.

1920	...	...	100	1924	...	...	29·63	1928	...	...	25·79
1921	...	...	37·59	1925	...	...	25·29	1929	...	...	24·87
1922	...	...	29·73	1926	...	...	27·98	1930	...	...	19·11
1923	...	...	28·38	1927	...	...	27·79				

During the period covered by the table the index number reached its highest level of 141 in March, 1920, and then fell fairly steadily to 25 in August, 1923, and to 22 in July, 1925. From the latter date to September, 1929—with the exception of a rise during the later months of the coal stoppage in 1926—the index number fluctuated between the limits of 22 and 30. It declined from 29 in January, 1929, to 24 in June and after remaining fairly steady from July to September it declined to 21 in December, 1929, and to 17 in May, 1930. From May to the end

of the year there was a slight rise but not sufficient to raise the average for the year above 19, which is two points less than the lowest monthly average previously recorded.

A similar index number for European coal freights has been calculated from 21 typical freights given in the Daily Freight Register Annual Review for 1930. Taking 1926 as base year (= 100), the average coal freight in 1927 was 93, in 1928 it fell to 84, but increased activity raised it to 95 in 1929; in 1930 it suffered a sudden drop to 67. Typical falls in yearly average freights between 1929 and 1930 are Tyne to Genoa, from 9s. 5d. to 6s. 7d. per ton; Gdynia to Genoa, from 11s. 4d. to 7s. 5½d. per ton; Tyne to Antwerp, 3s. 5½d. to 2s. 7½d. per ton.

The following table gives the general index number of shipping freights for each month of 1931, (1920=100) :—

January ...	20·56	May ...	20·61	September ...	18·45
February ...	19·33	June ...	18·83	October ...	21·58
March ...	19·68	July ...	18·35	November ...	21·83
April ...	19·90	August ...	18·66		

1931 has been, if anything, slightly better than 1930, so far as the level of freights is concerned.

Growth of the Merchant Fleet of Great Britain and Ireland, and of the World.—In considering the changes in freights, as indicated in the previous section, one must of course bear in mind the growth of the merchant fleet of the world. The following table—taken from Lloyd's Register of Shipping—gives the gross tonnage of vessels of 100 tons and upwards owned in (a) Great Britain and Ireland, (b) the World, over a period of years :—

Year.	Gt. Britain and Ireland.	The World.	Index Numbers (1920=100).	
			Gt. Britain and Ireland.	The World.
1913 ...	18,696,237	46,970,113	102·0	82·0
1920 ...	18,330,424	57,314,065	100·0	100·0
1921 ...	19,571,554	61,974,653	106·8	108·1
1922 ...	19,295,637	64,370,786	105·3	112·3
1923 ...	19,281,549	65,166,238	105·2	113·7
1924 ...	19,105,838	64,023,567	104·2	111·7
1925 ...	19,440,711	64,641,418	106·0	112·8
1926 ...	19,399,797	64,784,370	105·8	113·0
1927 ...	19,309,022	65,192,910	105·3	113·7
1928 ...	19,875,350	66,954,659	108·5	116·8
1929 ...	20,166,331	68,074,312	110·0	118·8
1930 ...	20,438,444	69,607,644	111·5	121·4
1931 ...	20,302,905	70,131,040	110·8	122·4

It will be seen that between 1913 and 1920 world tonnage increased by 10.3 million tons, though in this country we had not fully made up our losses during the War. Since 1920 world tonnage

has increased by 22.4 per cent. whilst British owned tonnage shows an increase only of 10.8 per cent. Our proportion of world tonnage has therefore steadily decreased; in 1913 we owned, as measured in tonnage, two ships out of five, in 1931 only two out of seven.

Vessels laid up.—The degree of depression in the shipping industry is, perhaps, best shown by a study of the number or tonnage of vessels laid up in port. The following table gives the tonnage of vessels laid up (a) at the principal ports of Great Britain and Ireland for January, April, July, and October of each year since 1921, except 1922; (b) at world ports for January and July each year. It is unfortunate that the former are given as *net* tonnage, and the latter as approximate *gross* tonnage; and we have been unable to obtain figures on the same basis for the two sets of ports. The difference in the tonnage basis must therefore be borne in mind in any "cross reading" of the table.

Vessels laid up.

Year.	Principal Ports of Great Britain and Ireland.			World Ports.
	British Owned. Net Tons.	Foreign Owned. Net Tons.	Total. Net Tons.	Approx. Gross Tons.
1921.				
January	—	—	940,604	—
April	—	—	1,707,271	—
July	1,650,788	201,624	1,852,412	—
October	1,158,425	137,811	1,296,236	—
1922.				
January	—	—	—	10,984,000
April	—	—	—	—
July	—	—	—	9,800,000
October	—	—	—	—
1923.				
January	648,912	60,312	709,224	9,128,000
April	506,372	40,183	546,555	—
July	667,527	41,575	709,102	8,000,000
October	727,134	27,967	755,101	—
1924.				
January	605,585	24,178	629,763	6,888,000
April	391,337	19,028	410,366	—
July	447,622	22,451	470,073	6,100,000
October	307,999	25,821	333,820	—
1925.				
January	469,951	18,301	488,252	5,978,000
April	377,461	15,601	393,062	—
July	753,721	23,458	777,179	6,800,000
October	556,567	17,797	574,364	—
1926.				
January	393,321	14,343	407,664	5,845,000
April	347,066	12,782	359,848	—
July	848,621	11,118	859,739	6,086,000
October	354,805	16,252	371,057	—

Vessels laid up.--cont.

Year.	Principal Ports of Great Britain and Ireland.			World Ports.
	British Owned. Net Tons.	Foreign Owned. Net Tons.	Total. Net Tons.	Approx. Gross Tons.
1927.				
January	352,416	12,458	364,874	4,076,000
April	228,049	11,632	239,681	—
July	413,835	6,329	420,164	4,000,000
October	267,235	5,604	272,839	—
1928.				
January	359,328	12,346	371,674	4,552,000
April	349,404	13,951	363,355	—
July	491,720	4,146	495,866	4,775,000
October	412,363	3,036	415,399	—
1929.				
January	311,657	18,114	329,771	4,007,000
April	233,115	3,127	236,242	—
July	377,012	4,146	381,158	3,250,000
October	260,470	5,527	265,997	—
1930.				
January	347,052	5,607	352,659	3,211,000
April	884,180	7,974	892,154	—
July	926,232	1,485	927,717	4,932,000
October	876,167	9,251	885,418	—
1931.				
January	1,310,598	20,549	1,331,147	7,629,000
April	1,567,513	21,691	1,589,204	—
July	1,672,539	21,035	1,693,574	10,086,000
October	1,710,582	6,868	1,717,450	—

It will be noticed that only on four occasions has the tonnage laid up in the principal ports of this country fallen below 300,000 net tons, namely, in April and October, 1927, and April and October, 1929; and only on two occasions that the tonnage laid up in world ports has fallen below 4 million gross tons, namely, July, 1929, and January, 1930. The position, both at home and abroad, in 1931 is very similar to the position in the slump years of 1921 and 1922. We cannot press the analogy further since, as the table reveals, we are without the British figures for 1922, and the world figures for 1921.

The large increase in the tonnage of shipping laid up has led to the use of ports and creeks, not hitherto included in the category of "principal ports of Great Britain and Ireland". The Chamber of Shipping therefore in January, 1931, obtained particulars from additional port authorities. It is estimated that the shipping laid up in these additional ports, etc., and therefore not included in the figures of the above table, would not exceed 3,000 to 4,000 tons in 1929 or in any of the immediately preceding years. But since

January, 1930, the tonnage laid up there makes an appreciable difference to the figures; thus for January, 1930, the tonnage would be increased from 352,659 tons to 365,429 tons. The later figures in the table should therefore be amended as follows:—

		<i>Net Tonnage laid up in British Ports.</i>	
		<i>At "Principal Ports."</i>	<i>At all Ports.</i>
1930.			
October	... ..	885,418	1,001,703
1931.			
January	... ..	1,331,147	1,570,115
April	... ..	1,589,204	1,919,786
July	... ..	1,693,574	2,044,092
October	... ..	1,717,450	2,089,443

The plight of the industry since the first quarter of 1930 is clearly revealed in the figures given in the table. In 1929 the tonnage laid up in British ports averaged about 300,000 tons. In the last three quarters of 1930 the average rose to about 900,000 tons, and by October, 1931, to over 2,000,000 tons. On the basis of gross tonnage being one and a half times net tonnage, this would amount to about 3,000,000 gross tons, or 15 per cent. of the total of British-owned tonnage. Comparing this with the world position we find that 10 million gross tons were lying idle at world ports or approximately 14.5 per cent. of the world's merchant fleet. But such a comparison, we need hardly point out, is valid only on the assumptions (1) that no appreciable amount of British-owned tonnage is laid up in foreign ports and (2) that the figures of tonnage laid up at world ports are really complete.

The position in the Survey Area ports is much the same, if not actually worse, than in the ports of the country as a whole. For several years prior to 1930 the tonnage laid up in the ports of Blyth, Newcastle, Sunderland, Hartlepool, and Middlesbrough varied somewhat about an average of 50,000 net tons. But in April, 1930, it rose to 245,296 net tons, and, according to information published by the Chamber of Shipping, has reached the following amounts since that time:—

Quarter ended July 1st, 1930	... ..	201,813 net tons.
" " October 1st, 1930	... ..	203,989 " "
" " January 1st, 1931	... ..	294,718 " "
" " April 1st, 1931	... ..	389,726 " "
" " July 1st, 1931	... ..	358,553 " "
" " October 1st, 1931	... ..	400,173 " "

Towards the end of 1931 every available berth was occupied, and when a vacancy occurred, it was immediately sought for. These figures do not, of course, give any indication of the comparative position of North East Coast owned shipping, since the vessels laid up, for example, on the Tyne, include vessels of many ports of registry.

(d) Causes of the Depression in the Shipping Industry.

The main cause of the depression in the shipping industry of the North East Coast is primarily due, as already indicated, to the depression in the coal export trade, the great bulk of which is carried in vessels owned by firms in the Area. To a lesser extent the local shipping industry has been dependent on the heavy iron and steel industry. Any revival of these two big local industries would bring about an improved position of the shipping industry in its local aspect.

But the shipping industry is a "mobile" industry in a sense that most other industries are "fixed". If cargoes are not to be obtained in one port, ships and men can be moved to another, or sent abroad on tramp service. It is impossible, therefore, to consider the local industry apart from the shipping industry nationally.

To what then do shipowners ascribe the present depression in the industry? In the first place they point to the world increase of shipping as being in excess of demand, the increase being due chiefly to the increase of foreign fleets, especially those of the United States, France, Greece, Holland, Italy, Japan and Norway. Much of the increase abroad has, it is asserted, been dictated by national sentiment and fostered by State subsidies and loans, as for example in Belgium, Italy, France, Greece and even Egypt. British shipowners appear to be of opinion that, apart from the results of this subsidised creation of tonnage, the growth of tonnage has been normal—a view which would seem to be supported by the conclusions of Sir Westcott Abell in the memorandum attached to our report. Hence in the main shipowners ascribe the present depression to a considerable shrinkage of world trade in the last twelve or eighteen months, due, in their opinion, to the slump in prices of world commodities on the one hand, and on the other hand to the growth of tariff barriers as a result of the policy of economic nationalism in an extreme form. They are, however, optimistic enough to feel that the future is not altogether black for the industry. The world's real wealth is constantly increasing, and if the monetary situation can be so controlled as to keep prices more stable, and the movement towards stronger measures of protection checked, an upward trend of business will begin.

(e) Employment.

The Ministry of Labour statistics of the insured employees and the number unemployed in the shipping industry are affected by the tendency of men, unemployed in other industries, to seek employment in the shipping service. This leads to an increase in the number of persons classified under shipping service

in slump years such as 1930 and 1931. The same effect is caused by the fact that in a prosperous year more ships would be at sea at the time when Unemployment books are due for exchange. In consequence, many books would not be exchanged till some time later and would not be included in the figures given by the Ministry of Labour. Again, with the mobility of shipping workers in their employment there is little stability in the shipping population for any area.

Statistics of employment in the dock, harbour, river, and canal services are a more correct indication of the state of affairs at North East Coast ports, but a somewhat artificial position has been created by the fact that a considerable number of workers normally employed in other industries seek casual labour at the docks. This has been offset to some extent by attempts made to de-casualize labour on the docks, by economies in working which have lessened the demand for labour, and by the operation of the Widows' etc. Pensions Act which led to numbers of dock workers leaving the field of Unemployment Insurance in 1927.

With all these factors tending to vitiate the correctness of the figures, it is surprising that a combination of the statistics for the shipping service and the dock, river, canal, and harbour service gives a fairly close correlation with the number of vessels arriving and departing with cargoes. It should be noted that the number of vessels is a yearly figure and that unemployment figures are taken at a definite date and that the number of vessels includes foreign vessels and vessels from other ports. For what they are worth the figures are as follows:—

Dock, Harbour, River, and Canal and Shipping Services (combined)—aged 16-64 (i.e., 1923-1927 figures are adjusted).

	Insured.		Employed.		Unemployed.	
	Survey Area.	U.K.	Survey Area.	U.K.	Survey Area.	U.K.
1923 ...	22,460	300,050	17,420	243,050	5,040	57,000
1924 ...	23,230	302,940	18,040	237,840	5,190	65,100
1927 ...	25,940	304,340	19,880	244,160	6,060	60,180
1929 ...	28,110	305,770	20,550	231,310	7,560	74,460
1930 ...	26,920	307,210	17,200	219,540	9,720	87,670
1931 ...	28,720	327,300	15,370	213,650	13,350	113,650

The proportions employed in the shipping service and in the dock, harbour, river, and canal service are approximately equal. The following index numbers show the correlation of the number employed with the flow of traffic at the docks:—

Index Numbers—Survey Area—1924=100.

Year.	Insured.	Employed.	Vessels arriving with cargoes.	Vessels departing with cargoes.
1924 ...	100	100	100	100
1929 ...	121	114	109	109
1930 ...	116	95.5	104	99

If this correlation is correct then we may expect employment to recover with the recovery of trade and to reach 20,000 at least in a prosperous year.

(iii) Railways.*(a) Traffic dealt with.*

That part of the North Eastern area of the L.N.E.R. (i.e., the former N.E.R.) lying north of a line excluding Whitby, Grosmont, Northallerton, and the Wensleydale branch has been taken as an approximation to the Survey Area. The following table illustrates the total revenue tonnage originating in this area, and the proportion formed by coal class traffic, other minerals, and merchandise and live stock, together with a comparison with similar figures for all railways in Great Britain.

Tonnage forwarded (in thousand tons).

Year.	Coal Class.	Other Minerals.	Merchandise and Live Stock.	Total.
A. Survey Area.				
1924	32,173	8,558	4,832	45,563
1929	34,159	8,993	4,446	47,598
1930	30,838	7,222	3,630	41,690
B. All railways in Great Britain.				
1924	209,160	65,393	63,370	337,923
1929	207,130	64,873	59,961	331,964
1930	193,289	57,846	55,504	306,639

It is impossible to measure the extent to which the fall in railway tonnages is due respectively to trade depression, to road competition, to changed demands, or to the rationalization of the basic industries which by combination of firms on a large scale both horizontally and vertically has reduced railway haulage, yet the combined effect of all factors is clearly shown in these tables. One significant fact is the importance of coal class and other minerals traffic in the Survey Area and the comparatively small general merchandise and live stock traffic, and this despite the fact that

the figures do not include coal which is either hauled by private engines over the L.N.E.R. or purely on private lines from the collieries to the coast, which amounted to approximately 14 million tons in 1929 and 12 million tons in 1930. Traffics in 1929 exceeded those for 1924 in the Survey Area both as regards coal and other minerals, though the effect of road competition is shown in decreased general merchandise figures and it is not till 1930 that the effect of trade depression shows itself. Between 1929 and 1930, coal class traffic fell in the Survey Area by 9.7 per cent., other minerals by 19.7 per cent., merchandise and live stock by 18.4 per cent., and the total traffic by 12.4 per cent. In the country as a whole coal class traffic fell at the same time by 6.7 per cent., other minerals by 10.8 per cent., merchandise and live stock by 7.4 per cent., and the total traffic by 7.6 per cent. These figures illustrate that the Survey Area fared comparatively worse than did the country as a whole between 1929 and 1930 and thus lost the major part of the advantage it had gained between 1924 and 1929. The percentage of traffic which originated in the Survey Area as compared with Great Britain fell from 14.3 in 1929 to 13.6 in 1930 after rising from 13.5 in 1924. It is significant that the percentage of employed in the basic industries in the Survey Area rose in the same way from 15.0 in 1924 to 15.6 in 1929 and fell to 15.0 per cent. in 1930.

The most serious falls in coal class traffic in the Survey Area between 1929 and 1930 were in traffic for shipment at ports in the North East Area (from 23,556,000 tons to 21,779,000 tons as against 22,447,000 tons in 1924), and in traffic for ironmaking purposes (from 5,912,000 tons to 4,803,000 tons as against 5,663,000 tons in 1924). Traffic for household, manufacturing, and other purposes also showed a decrease from 4,691,000 tons to 4,256,000 tons, but the 1924 level of 4,178,000 tons was not reached. Shipment traffic therefore forms approximately two-thirds of the total traffic and contributes the greatest actual fall, but the important fact appears to be the fall in 1930 in traffic for ironmaking purposes of 18.8 per cent. as compared with 1929 and of 15.2 per cent. as compared with 1924, while shipment traffic in 1930 only fell 3.0 per cent. as compared with 1924, though, as is shown later, it is now falling more heavily.

Other mineral traffics are dealt with partly through goods accounts and partly through mineral accounts. Traffic through mineral accounts fell from 3,543,000 tons in 1929 to 2,886,000 tons in 1930, there being falls in ironstone from 2,281,000 tons to 1,889,000 tons, in limestone for blast-furnaces and steel works from 1,109,000 tons to 825,000 tons, and in lime for ironmaking from 75,000 tons to 61,000 tons, indicating that the needs of the heavy industries were reduced in the one year by approximately 20 per cent., which, it will be seen, agrees with the fall in coal for iron-making purposes.

The trend of the coal and other minerals traffic statistics thus seems to indicate that the basic industries, and therefore the Survey Area which depends to so great an extent on these industries, experienced a boom in 1929 in comparison with other years in the Survey period. But, if one compares the figures with those for a longer period, then it appears as if we experienced in 1929 a return to the normal trade increase curve after the dislocation of 1926. Thus coal for shipment at North East Area ports rose from 17 million tons in 1902, to 18 in 1905, 20 in 1910 and 22 in 1913. After the War, in 1919 it was 13.6 million tons, rising to 22.5 in 1922, 24.4 in 1923, 22.4 in 1924 and 23.6 in 1929. Coal and coke for ironmaking purposes, on the other hand, appears to have found a new permanent lower level after the coal stoppage in 1921, for after rising fairly steadily from 6,730,000 tons in 1902 to 8,156,000 tons in 1920, it suddenly fell to 3,138,000 tons in 1921. Since then the figures show increases from 4,211,000 tons in 1922 to 5,663,000 tons in 1924 and 5,912,000 tons in 1929, and it will be seen that the 1929 figures fit into a gradual upward movement after settling down in 1921-1922, and that the 1930 figures are a slump from the curve represented by the 1922, 1924, and 1929 figures. Coal class traffic and other minerals traffic through minerals accounts, which thus account for about 80 per cent. of the total traffic forwarded, are traffics in which direct road competition is of less importance than in the case of general merchandise, and in which the changes in the railway traffic figures are mainly a reflection of conditions in the coal and heavy industries. Rebates given under the derating scheme to selected traffics, which include exported coal and coke, have tended to reduce the cost of inland transport as an adverse factor in the competition with foreign countries.

We now come to traffic dealt with through goods accounts as follows. This forms the remaining 20 per cent. of the total traffic forwarded :—

	1924.	1929.	1930.
	<i>000's tons.</i>	<i>000's tons.</i>	<i>000's tons.</i>
Forwarded to Stations in N.E. Area	8,075	7,645	5,953
Forwarded to other Stations ...	2,335	2,252	2,014
Total	10,410	9,897	7,967

The fall in these figures is due to a combination of road competition and trade depression, the latter not being seriously felt till 1930. In the section dealing with Road Transport it is computed as a rough estimate that 1,225 thousand tons of merchandise are now dealt with annually by road in the Survey Area and this may be used as a very approximate indication of the comparative effects of the two factors. If we add this estimate of 1,225 thousand tons transferred to road transport, we obtain a fall of 12 per cent. from the total traffic forwarded by rail in 1924, when road competition was relatively insignificant. It will be noticed also that the fall has not

been so serious in traffic forwarded to other stations; this may be assumed to be longer distance traffic and only fell 14 per cent. between 1924 and 1930. This fall must be to a large extent due to trade depression and thus it appears that the fall due to trade depression is in the neighbourhood of 12 to 14 per cent. and the fact that short distance traffic, which is affected by both road competition and trade depression, falls by 26 per cent. indicates that each of the two factors have accounted for about half the decrease.

A complete analysis by commodities of the traffic forwarded in the Survey Area is not available but a sample has been made by abstracting particulars of the principal commodities forwarded from the following selected stations:—Ashington, Blyth, Bishop Auckland, Consett (including Iron-works), Darlington, Gateshead (including Felling, Dunston, and Redheugh), Middlesbrough (including South Bank), Newcastle (consisting of Forth Elswick, New Bridge Street, and Quayside), East and West Hartlepoons (excluding Dock Hauled Tonnage), and Sunderland (including South Dock, Wearmouth Dock, and Southwick). A summary of the principal traffics forwarded from these stations is as follows, special note being made that, owing to an entirely new classification for commodity purposes coming into force on 1st January 1928, the 1924 figures are not strictly comparable with those for 1929 and 1930. Though they cannot therefore be used in any great detail they are sufficiently comparable to give a fairly broad indication of changes in the flow of traffic.

Principal Commodities forwarded from above Stations.

	1924.	1929.	1930.
	000's tons.	000's tons.	000's tons.
Iron and Steel (Lists K.L.M.)	1,224	1,421	1,136
Timber	826	569	484
Iron Ore	692	304	211
Slags, Cinders, and Ashes	568	367	274
Pig Iron	456	469	386
Scrap Iron and Steel	219	215	159
Grain, Flour and Milling Offals	110	63	61
Creosote, Tar and Pitch	92	98	83
Manure	77	86	70
Cement	75	38	28
Gravel and Sand	75	40	38
Confectionery, Preserves, Groceries, and Provisions.	75	53	50
Blooms, Billets, and Ingots	71	230	152
Chemicals	31	44	30
Machinery	27	29	23
Paper	9	12	11
Bricks, Blocks, and Tiles	11	26	16
Paper Making Materials	3	37	28
Total	4,641	4,101	3,240
Total—these stations	5,077	5,006	3,876
Total—Survey Area through goods station accounts.	10,410	9,897	7,967

N.B.—See note above as to comparability of 1924 figures.

It will be seen that the sample accounts for rather less than half of the total traffic forwarded and while it would be outside the scope of this section to go into further detail we may arrive at certain broad conclusions. First, the fall between 1929 and 1930 is general and in most cases the 1930 figures have fallen below those for 1924—certain discrepancies may be due to the change in classification. Nor is the general fall surprising, since commodities not hit directly by trade depression in the basic industries are those likely to be attacked by road competition. The second conclusion one comes to is that even in this type of traffic, the interests of the heavy industries and especially of the iron and steel and engineering industries predominate. Thus in 1929, iron and steel, iron ore, slag, cinders and ashes, pig iron, scrap iron and steel, blooms, billets, and ingots, and machinery account for 3,035 thousand tons out of the 4,101 thousand tons included in the sample, and of the 5,006 thousand tons forwarded from the selected stations.

Tonnage received through the goods department at stations in the Survey Area was as follows:—

	1924.	1929.	1930.
	'000 tons.	'000 tons.	'000 tons.
Received from stations in N.E. Area ...	(Not available).	7,459	5,730
Received from other stations ...	2,077	2,202	1,939
Total received at all stations ...	(Not available).	9,661	7,669
Total received at selected stations ...	4,563	5,108	4,220

The 1930 and 1929 figures bear similar relations to one another, as do the figures for the same two years for forwarded traffic, but there is an actual rise in traffic received between 1924 and 1929, despite road competition; while traffic forwarded from the selected stations fell during this period from 5,077 thousand tons to 5,006 thousand tons, traffic received rose from 4,563 thousand tons to 5,108 thousand tons. This appears to be mainly due to a rise in received traffic at the Middlesbrough stations from 2,263,995 tons in 1924 to 2,831,000 tons in 1929, the main increases being in sulphate or ammonia, and iron ore from Northants.

(b) *Present Position.*

It is not possible to carry particulars for the Survey Area further than the end of 1930 but monthly traffic figures for the North Eastern area of the L.N.E.R., are available up to August 1931, and are summarized from January 1929 to that date in Table 6. A graph (see Table 7) has also been prepared from these details to show the trends since the beginning of 1929, on a three monthly moving average basis which cuts out minor variations. By taking the average traffic forwarded per working day, the effect of different periods containing varying numbers of

working days is eliminated. Conditions in the North Eastern area of the L.N.E.R. and of that part of it formed by the Survey Area are similar enough to make conclusions which are true for the whole approximately true for the part.

The table and graph bring out clearly the seasonal variations in traffic and, in addition, the effect of the slump in 1930. There are really four periods to consider, namely :—

(1) *January, 1929—March 1930.*—During this period traffic in classes (A) (Coal, Coke and Patent Fuel), (B) (Minerals and Merchandise classes 1-6) and (C) (Merchandise, excluding classes 1-6) were well maintained, the slight fall in Class C being due to road competition.

(2) *March, 1930—August, 1930.*—In the period February-April, 1930 the figures cross those for 1929, and the rapid downward movement begins, to continue till July in the case of Class A and August in the cases of Classes B and C. The average tonnage forwarded per working day in the period June to August fell from 125,900 tons in 1929 to 103,400 tons in 1930 in Class A, from 33,200 tons to 23,300 tons in Class B, and from 25,800 tons to 21,600 tons in Class C.

(3) *August, 1930—March, 1931.*—After this rapid increase month by month in the difference between 1930 and 1929 figures from March to August, 1930, the rate of slump slowed down in August and from that date to March, 1931, while there is still a difference between figures in the two years, this difference is approximately constant month by month and does not increase. In other words, it appears as if low level were reached in August.

(4) *March, 1931—August, 1931.*—If this low level had been actually reached in August, 1930, then one would expect the difference between the figures in 1931 and 1930 to decrease gradually in this last period. This holds true in Class B, in which the falls in corresponding periods in the average tonnage forwarded per day were as follows :—

February—April	...	...	...	10,200 tons.
March—May	...	...	...	9,500 "
April—June	...	...	...	7,800 "
May—July	...	...	...	5,500 "
June—August	...	...	...	3,800 "

While traffic in this class fell from 33,200 tons per day in the period June-August, 1929, to 23,300 tons per day in the same period in 1930, it only fell to 19,500 tons per day in the same period in 1931. But there is no similar tendency in Class A traffic in which the difference between 1931 and 1930 figures is still being maintained, and this appears due to continued decreases in shipment coal traffic. Thus if we compare the average daily traffic carried over the L.N.E.R. (N.E. Area) in the case of shipment coal traffic, coal for ironmaking in the N.E. Area, and coal for manufacturing in the

N.E. Area as below, we see that while the shipment coal figures are still showing decreases from 1930, coal for other purposes is now approaching the 1930 figures, just as the Class B and Class C figures.

Coal and Coke.

Thousand tons conveyed over N.E. Area per working day.

	<i>For Shipment Purposes.</i>	<i>For Iron Making.</i>	<i>For Manufacturing in N.E. Area.</i>
June, 1930	75.5	15.3	9.4
July ...	77.4	14.5	9.9
August ...	74.9	12.1	8.9
June, 1931	65.4	11.9	9.8
July ...	62.8	12.9	10.0
August ...	60.9	11.2	8.9

Summarising, it appears as if the heavy industries (represented by Class B traffic and coal for manufacturing and ironmaking purposes) more nearly reached their low level in August, 1930, but that shipment coal traffic, which did not fall so badly in 1930, is experiencing a second slump in 1931.

(c) Employment.

There is a difficulty in using Unemployment Insurance statistics for employment on the railways due to the fact that a large proportion of workers are excepted from the provisions of the Act, and therefore are not included in the totals. The railway companies, however, compile an annual census of employees which includes all receiving salaries or wages in a specified week in March each year, and the results of this census are available for (1) all railways in Great Britain (2) the North Eastern area of the L.N.E.R. It is found that in 1924, the number employed in the N.E. area form 9.3 per cent. of the total employed in Great Britain and in 1930, they form 8.6 per cent. In the same two years, the net ton miles worked over the N.E. area formed 10.1 per cent. and 9.5 per cent. of the net ton miles worked over all lines, so that to obtain an estimate of the number employed in the Survey Area—information which is not otherwise available—it seems as if we would not be far wrong in taking the same proportion of the employed in the N.E. area as the proportion of net ton miles worked over the Survey Area to the net ton miles worked over the N.E. area. This latter proportion was 54.8 per cent. in 1924 and 57 per cent. in 1928 and 1930, and if we assume that the latter proportion also holds good in 1931, we arrive at the following estimate of numbers employed in the Survey Area, viz. :—1924, 35,550; 1928, 33,340; 1930, 32,210; and 1931, 28,830.

Between 1924 and 1930 tonnage forwarded in the Survey Area fell by 8.5 per cent., net ton miles worked over the Area fell by 8.9 per cent., and estimated employment by 9.4 per cent., this higher fall being due most likely to the fact that the previous

figures take no account of the serious fall in passenger traffic due to road competition, which also affects the employment figures. Any attempt to anticipate employable capacity must take into account :—

(1) that approximately 80 per cent. of the total traffic forwarded is outside the effect of road competition and the fall in the remaining 20 per cent. is half due to road competition, which also accounts for a serious fall in passenger traffic.

(2) that the remaining fall in traffic since 1924 in 1930 is due to trade depression, namely, 2,648,000 tons as against approximately 1,225,000 tons due to road competition.

We may thus anticipate that the increase over 1930 figures in employable capacity of the railways will never exceed 66 per cent. of the fall between 1924 and 1930, indicating that the number employed will never exceed 34,435.

(iv) Road Transport.

(a) General.

There are no reliable statistics available of the amount of goods traffic going by road and for a measure of the development of this transport agency we have to fall back on (1) particulars of the number of goods commercial vehicles licensed in the Survey Area, (2) the results of traffic censuses taken periodically, and (3) certain estimated figures of the present position of road traffic.

The number of goods motor vehicles for which licences were current in the Survey Area (see Table 8) showed an increase from 9,078 in 1926 to 11,996 in 1930—i.e., 2,918, or 32 per cent.

It is impossible to separate the growth in vehicles engaged on what one may call "real" road transport from tradesmen's town delivery vehicles, but the increase can be checked by comparison with the results of the Traffic Censuses of the Ministry of Transport (see Table 9). These censuses were taken at selected points on class I and class II roads and as they were taken outside the towns a large part of the delivery element is excluded. The average number of goods motor vehicles passing selected points on class I roads increased by 38.96 per cent. in the three year period 1925-1928 and on class II roads by 47.34 per cent. in the three year period 1926-1929. But in the same periods the estimated gross tonnages of these vehicles only increased by 20.84 per cent. and 2.83 per cent. respectively. If a larger proportion of the goods vehicles are now being used outside the towns, this would explain the greater increase shown in the Traffic Censuses than in the licence statistics, while another explanation may be a more intensive use of the vehicles. The decrease in the average gross tonnage per vehicle as revealed by the Traffic Censuses is surprisingly large, since the average unladen weight per vehicle as revealed by the licence statistics is estimated to have fallen only from 1.92 tons in 1926 to 1.80 tons in 1930, due to the increased use of vehicles of unladen weight exceeding 1 ton but not exceeding 2 tons. This would appear to

indicate that the growth in the use of light vehicles has been especially marked in the country. Trade depression has not had the effect of decreasing the total number of goods vehicles but it is significant that there was an increase of only 521 vehicles between 1929 and 1930 as against an increase of 1,079 vehicles in the previous year.

From an estimate which has been made recently of road carryings in the Northern counties it has been deduced that approximately 1,225,000 tons are carried per annum in the Survey Area.

There has been a development in road transport along two main lines in the Survey Area as in the country as a whole :—

(1) short distance haulage of a localised nature of almost every description of traffic.

(2) long distance haulage of say over 40 miles, confined to general streams of traffic between larger towns, between these towns and ports, and to specific consignments of a bulk character whether regular or sporadic.

An important feature in short distance haulage is the growth of distribution by their own vehicles on the part of wholesale firms. For example, a large district is now served by road by Newcastle provision traders distributing butter, bacon, eggs, sugar, fruit, etc. from Newcastle Market and direct from the docks. Growing up alongside is a tendency for firms with a national market such as biscuit manufacturers, brewers, etc. to distribute by rail to depots at important centres such as Newcastle and to distribute thence by road. It is impossible to say that short distance road haulage is confined to any definite class of goods. Blocks of such traffic as bricks, cement, roadstone, iron and steel, and even coal pass by road, mainly because of high rail terminal costs and the difficulty of delivering to site. Increasing use of the road is being made for urgent machinery replacements, and the tendency of manufacturers to forward articles complete instead of in sections leads to many things of this kind now being carried by road which are out of gauge by rail.

Long distance road traffic in the Survey Area has developed to the greatest extent between Newcastle and Liverpool. The route taken is via Leeds and the West Riding and numerous Lancashire towns are embraced. The traffic is mainly in the hands of hauliers, a number of whom run regular daily services. Private traders also participate.

Competition between rail and road in the Survey Area is widespread and general and there appears to be no sign of road transport having reached its maximum. In this respect conditions do not differ in any marked degree from those ruling in other parts of the country. It is increasingly apparent that the whole question of the future relationship of rail and road transport is a national rather than a local problem, and no solution can be found by mere reference to local conditions in a comparatively small Area.

(b) Employment.

In 1924, 5,290 persons were insured in the Survey Area under the heading "Road Transport" and 1,194 were registered as unemployed, equal to 22.6 per cent. This proportion fell to 22.5 per cent. in 1927 but with the tendency of labour to be attracted to a growing industry this proportion rose to 24.6 per cent. in 1929, 26.7 per cent. in 1930, and 28.6 per cent. in 1931, indicating that more labour has been attracted than the industry could absorb. An increase of 3,160 persons insured between 1924 and 1931 has led to an increase of 1,221 persons unemployed, and there has been an increase in the employment capacity of the industry of about 1,939. Co-incident with the expected further development of road transport, there seems no reason why employment capacity should not increase to 7,000, from 4,096 in 1924, 5,078 in 1927, 5,833 in 1929, 5,703 (a temporary set back) in 1930, and 6,035 in 1931.

As one would expect, since employment is not so haphazard and industry is better organized, there has not been the same surplus over demand under the heading of Tramway and Omnibus Services, nor is the percentage of unemployed to insured so high. This percentage has varied from 5.6 in 1924, to 7.1 in 1927, 4.4 in 1929, 6.8 in 1930, and 8.3 in 1931. Between 1924 and 1931, there has been an increase of 4,280 persons insured; of these 3,768 have been absorbed and there has been an addition to unemployment of only 512. In this case, however, there does not seem to be the same prospect of any great increase in the employment capacity. Any further increase in local omnibus services is difficult to foresee. It may be expected that the effect of the new licensing regulations will be to stabilise the present state of affairs with, if anything, a tendency for the two large omnibus companies operating in the Area to absorb the licensed services of their smaller competitors. Any process of co-ordination or absorption of this sort will tend to reduce employment capacity. So far as long distance and express services are concerned, there is expected to be further development in the form of cross country services especially between points where the amount of traffic does not warrant through express trains and where existing rail services are poor. Such a development will have no great effect on employment capacity.

Again, the displacement of tramways by omnibuses does not mean increased labour equal to the increase in gross receipts. In this connection the employment statistics of the Newcastle Corporation Tramways are of interest. Between the years ending 31st March, 1924, and 1931, the number of employees in the omnibus department increased from 101 to 396 but in the tramway department, decreased from 1,500 to 1,280, a net increase of only 75 men. A training school, it may be said, has been organised with the object of training tram motormen, and conductors, to become efficient bus drivers, and a number of redundant tram employees have been

absorbed by the omnibus section. During the same period gross revenue increased by £60,458, equal to 10.94 per cent., while the increase in employees was only 4.68 per cent.

Taking everything into account, the employment capacity may be expected to increase not further than 9,500, from 5,212 in 1924, 6,411 in 1927, 8,200 in 1929, 8,551 in 1930, and 8,980 in 1931.

The employment capacity of transport, communication, and storage services is very small and is decreasing rapidly. In normal times it may recover sufficiently to absorb 300 persons.

The following statistical tables are appended :—

Number of licences issued for goods vehicles.—Table 8.

Results of Traffic Censuses.—Table 9.

Employment statistics.—Table 10.

APPENDIX.—STATISTICAL TABLES.

TABLE 1.—Summary of Overseas Trade of the United Kingdom and North East Coast Ports.

1913, 1924, 1929, 1930.

(In Million £'s.)

Year.	Food, Drink, Tobacco.			Coal and Coke, etc.			Raw Materials.			Manufactures.			All classes, including animals, not for food, parcel post and articles not classified.			
	U.K.	N.E.	Per cent. N.E.	U.K.	N.E.	Per cent. N.E.	U.K.	N.E.	Per cent. N.E.	U.K.	N.E.	Per cent. N.E.	U.K.	N.E.	Per cent. N.E.	
			U.K.			U.K.			U.K.			U.K.			U.K.	
IMPORTS.																
1913	...	295·15	7·92	2·68	·04	—	—	269·93	7·55	2·80	201·01	2·09	1·04	768·73	18·75	2·44
1924	...	571·09	16·22	2·84	·02	—	—	400·00	9·28	2·32	299·77	2·78	0·93	1,277·44	30·23	2·37
1929	...	535·47	16·13	3·01	·05	—	—	339·54	7·43	2·19	334·34	4·41	1·32	1,200·77	30·80	2·57
1930	...	475·55	13·86	2·91	·04	—	—	250·78	6·10	2·43	307·49	3·57	1·16	1,044·84	25·92	2·48
EXPORTS—BRITISH PRODUCE AND MANUFACTURES.																
1913	...	33·88	0·46	1·36	53·66	14·78	27·6	15·45	0·30	1·94	410·89	17·86	4·35	525·25	34·15	6·50
1924	...	56·96	0·17	0·30	78·31	24·96	31·9	34·40	0·83	2·41	612·62	18·16	2·96	800·97	45·35	5·66
1929	...	55·66	0·21	0·38	52·85	16·11	30·5	30·45	0·66	2·17	569·60	23·37	4·10	729·35	41·40	5·68
1930	...	48·25	0·17	0·35	49·22	14·53	29·5	18·14	0·46	2·54	436·20	21·67	4·96	570·55	37·81	6·63

TABLE 2B.—Principal Imports.
(Expressed in thousands of each unit specified.)

	Unit.	1913.		1924.		1929.		1930.	
		Quantity.	£1,000.	Quantity.	£1,000.	Quantity.	£1,000.	Quantity.	£1,000.
RAW MATERIALS AND UNMANUFACTURED ARTICLES.									
<i>Berwick—</i>									
Wood and timber	loads	8	25	11	62	5	23	5	22
<i>Blyth—</i>									
Wood and timber	loads	49	87	36	109	23	65	16	49
<i>Hartlepoons—</i>									
Iron ore and scrap	tons	383	380	197	196	24	29	—	—
Zinc and other ores... ..	tons	127	98	38	160	19	78	18	57
Wood and timber	loads	580	1,265	696	2,594	459	1,476	455	1,390
Dry wood pulp	tons	2	17	—	—	12	137	6	65
<i>Middlesbrough—</i>									
Iron ore and scrap	tons	2,088	2,020	1,769	2,073	1,965	2,270	1,277	1,489
Manganese ore	tons	201	410	147	590	142	469	74	237
Wood and timber	loads	41	93	27	110	22	88	26	86
<i>Newcastle—</i>									
Hemp	tons	1	26	3	121	3	86	2	71
Chemical manures	tons	22	84	31	40	16	17	22	25
Iron ore and scrap	tons	544	529	317	348	502	462	479	477
Silver ore	value	—	315	—	34	—	4	—	2
Other ores	tons	68	265	19	55	13	31	8	32
Paper making materials	tons	37	154	50	345	43	212	33	178
Wood and timber	loads	435	1,001	358	1,546	342	1,347	362	1,253
<i>Stockton—</i>									
Iron ore and scrap	tons	202	200	150	253	1	4	1	1
<i>Sunderland—</i>									
Iron ore and scrap	tons	141	112	46	43	53	46	85	78
Paper materials	tons	21	74	25	148	27	181	22	157
Wood and timber	loads	125	285	99	407	118	377	106	321
Total these imports	—	—	7,440	—	9,234	—	7,402	—	5,990
Total imports of raw materials, etc.	—	—	7,554	—	9,277	—	7,430	—	6,102

TABLE 2C.—Principal Imports.
(Expressed in thousands of each unit specified).

	Unit.	1913.		1924.		1929.		1930.		
		Quantity.	£1,000.	Quantity.	£1,000.	Quantity.	£1,000.	Quantity.	£1,000.	
ARTICLES WHOLLY OR MAINLY MANUFACTURED.										
<i>Hartlepool—</i>										
Iron and Steel	... .. tons	10	65	1	11	—	1	2	14
Machinery	... .. tons	1	34	—	—	—	—	—	—
<i>Middlesbrough—</i>										
Iron and Steel	... .. tons	55	322	97	603	74	486	99	564
Crude Zinc	... .. tons	5	125	1	46	7	182	4	68
Machinery	... .. tons	—	12	—	—	3	281	2	204
Jute	... .. cwts.	—	—	—	—	157	307	77	132
Chemicals	... .. value	—	—	—	—	—	22	—	36
Paper	... .. cwts.	—	—	—	—	56	38	20	17
<i>Newcastle—</i>										
Chemicals	... .. value	—	54	—	70	—	112	—	128
Glass	... .. value	—	80	—	64	—	77	—	78
Machinery	... .. tons	1	51	1	91	5	400	4	316
Iron and Steel	... .. tons	36	270	45	469	50	485	47	458
Lead and Zinc	... .. tons	32	582	9	302	19	456	17	304
Petroleum	... .. gallons	186	10	13,512	273	19,427	351	20,606	330
Paper	... .. cwts.	133	85	185	182	227	241	236	212
Wood and timber	... .. value	—	12	—	45	—	107	—	86
Cement	... .. tons	—	—	28	61	15	27	13	21
<i>Stockton—</i>										
Iron and Steel	... .. tons	41	205	62	417	95	548	59	336
Crude Zinc	... .. tons	—	—	3	108	1	34	1	13
<i>Sunderland—</i>										
Petroleum	... .. gallons	6,701	100	262	4	717	10	894	13
Iron and Steel	... .. tons	2	16	—	—	13	97	12	87
Total these imports	...	—	2,023	—	2,746	—	4,262	—	3,417	
Total imports of manufactured articles	...	—	2,088	—	2,775	—	4,417	—	3,573	

TABLE 2D.—*Principal Exports of British Produce and Manufactures.*

(Expressed in thousands of each unit specified.)

—	Unit.	1913.		1924.		1929.		1930.		
		Quantity.	£1,000.	Quantity.	£1,000.	Quantity.	£1,000.	Quantity.	£1,000.	
FOOD, DRINK, AND TOBACCO.										
<i>Berwick—</i>										
Herrings	cwts.	106	61	88	68	70	47	26	19	
<i>Blyth—</i>										
Herrings	cwts.	183	97	—	—	—	—	—	—	
<i>Hartlepool—</i>										
Herrings	cwts.	86	49	—	—	—	—	—	—	
<i>Middlesbrough—</i>										
Salt	tons	49	32	13	19	8	14	11	19	
<i>Newcastle—</i>										
Fish	cwts.	152	84	35	23	35	26	19	18	
Grain	cwts.	437	136	41	37	17	10	2	1	
Spirits	pf. gallons	—	—	18	26	44	55	59	70	
Meat	cwts.	—	—	—	—	24	57	24	46	
Total these exports...	—	—	459	—	173	—	209	—	173	
Total exports of food, etc. ...	—	—	459	—	174	—	209	—	173	

RAW MATERIALS AND UNMANUFACTURED ARTICLES.

<i>Hartlepool—</i>									
Wool	lbs.	1,674	112	—	—	—	—	—	—
<i>Middlesbrough—</i>									
Iron and steel scrap ...	tons	15	60	9	52	5	23	2	6
Coal tar pitch	tons	—	—	88	374	76	151	70	148
<i>Newcastle—</i>									
Zinc ore	tons	12	54	—	—	—	—	—	—
Lead ore and scrap ...	tons	—	—	—	—	6	96	6	79
Stones and slates	tons	10	30	—	—	—	—	—	—
Rags	cwts.	—	—	7	37	—	—	—	—
Wool	lbs.	—	—	994	109	1,271	91	1,034	60
Hides and skins	value	—	48	—	256	—	226	—	72
Coal tar pitch	tons	—	—	—	—	37	71	25	55
<i>Sunderland—</i>									
Coal tar pitch	tons	—	—	1	5	3	4	17	35
Total these exports	—	—	304	—	83	—	662	—	455
Total exports raw materials	—	—	304	—	833	—	662	—	455

TABLE 2E.—Principal Exports of British Produce and Manufactures.

(Expressed in thousands of each unit specified.)

—	Unit.	1913.		1924.		1929.		1930.		
		Quantity.	£1,000.	Quantity.	£1,000.	Quantity.	£1,000.	Quantity.	£1,000.	
MANUFACTURED ARTICLES.										
<i>Hartlepool—</i>										
Machinery	...	tons	5	217	—	1	—	9	—	20
Woollen goods	...	lbs.	5,698	462	—	—	—	—	—	—
*Ships and boats	...	gr. tonnage	50	600	9	154	11	246	23	394
Chemicals	...	tons	—	—	—	—	—	—	11	82
<i>Blyth—</i>										
*Ships and boats	...	gr. tonnage	7	100	3	65	—	—	3	45
<i>Middlesbrough—</i>										
Arms, etc.	...	value	—	309	—	1	—	—	—	—
Chemicals	...	value	—	530	—	1,803	—	4,760	—	3,418
Manures	...	tons	107	788	—	—	5	45	11	85
Machinery	...	tons	14	743	6	528	6	437	5	307
Iron and steel	...	tons	1,314	7,753	766	7,731	761	6,920	484	4,583
*Ships and boats	...	gr. tonnage	21	340	2	62	25	819	41	1,106
Woollen goods	...	value	—	540	—	644	—	69	—	11
Cotton goods	...	value	—	183	—	53	—	13	—	14
Railway vehicles	...	value	—	2	—	588	—	832	—	612

1873	<i>Newcastle—</i>									
	Cotton piece goods	yards	11,238	219	23,603	1,021	15,209	607	14,407	825
	Other cotton	value	—	56	—	305	—	340	—	338
	Machinery	tons	8	477	6	441	5	581	5	549
	Iron and steel	tons	34	377	54	536	65	400	39	319
	*Ships and boats	gr. tonnage	61	1,371	25	689	125	3,303	219	5,321
	Railway vehicles	value	—	—	—	204	—	673	—	292
	Woollen goods	value	—	117	—	1,119	—	875	—	776
	Chemicals	value	—	387	—	548	—	420	—	545
	<i>Stockton—</i>									
Iron and steel	tons	41	205	53	503	12	125	5	51	
<i>Sunderland—</i>										
*Ships and boats	gr. tonnage	83	1,107	—	—	40	660	51	1,182	
Chemicals	value	—	95	—	67	—	163	—	71	
Total these exports	—	—	16,978	—	17,183	—	22,307	—	20,846	
Total exports of manufactured articles.	—	—	17,800	—	18,156	—	23,372	—	21,666	

* New, not registered as British, with their machinery.

TABLE 3.—*Net Tonnage of Sailing, Steam and Motor Vessels, including their repeated voyages, that arrived or departed with Cargoes and in Ballast.*

Unit = 1,000 tons.

Year.	Foreign Trade.		Coasting Trade.		Total.	
	United Kingdom.	N.E. Coast.	United Kingdom.	N.E. Coast.	United Kingdom.	N.E. Coast.

VESSELS ARRIVING WITH CARGOES.

1924	...	66,231	3,413	20,576	618	86,807	4,031
1925	...	66,356	2,977	20,627	599	86,983	3,576
1926	...	74,527	2,785	16,197	531	90,723	3,316
1927	...	71,976	3,418	22,160	624	94,136	4,042
1928	...	73,652	3,044	23,038	660	96,690	3,704
1929	...	77,358	3,569	24,021	642	101,379	4,211
1930	...	—	3,136	—	654	—	3,790

VESSELS ARRIVING IN BALLAST.

1924	...	43,002	9,912	26,630	6,950	69,632	16,862
1925	...	40,601	8,420	26,590	6,395	67,191	14,815
1926	...	29,124	3,931	17,854	3,482	46,978	7,413
1927	...	42,775	8,925	28,507	7,826	71,282	16,751
1928	...	44,423	9,044	28,823	7,794	73,246	16,838
1929	...	48,466	9,953	31,164	8,448	79,630	18,401
1930	...	—	9,387	—	8,095	—	17,482

VESSELS DEPARTING WITH CARGOES.

1924	...	74,986	12,520	20,692	3,733	95,678	16,253
1925	...	72,584	10,675	20,602	3,631	93,186	14,306
1926	...	56,116	5,466	16,096	1,965	72,212	7,431
1927	...	74,079	11,205	22,073	4,152	96,152	15,357
1928	...	76,085	11,166	22,904	4,597	98,989	15,763
1929	...	81,324	12,508	23,733	5,178	105,057	17,686
1930	...	—	11,123	—	5,001	—	16,124

VESSELS DEPARTING IN BALLAST.

1924	...	35,771	2,855	26,558	2,230	62,329	5,085
1925	...	35,669	2,415	26,513	1,999	62,182	4,414
1926	...	48,177	2,649	17,988	946	66,165	3,595
1927	...	41,017	3,482	28,266	2,059	69,283	5,541
1928	...	42,484	3,131	28,758	1,921	71,242	5,052
1929	...	44,641	2,890	31,197	2,193	75,838	5,083
1930	...	—	3,312	—	2,058	—	5,370

Source—Annual Statement of Navigation and Shipping.

TABLE 4.—Index Numbers of Net Tonnage of Sailing, Steam and Motor Vessels, including their repeated voyages that arrived or departed with Cargoes and in Ballast.

(Base year 1924 = 100). See Table 3 for source.

Year.	Foreign Trade.		Coasting Trade.		Total.	
	United Kingdom.	N.E. Coast.	United Kingdom.	N.E. Coast.	United Kingdom.	N.E. Coast.

VESSELS ARRIVING WITH CARGOES.

1924	...	100	100	100	100	100	100
1925	...	100	87	100	97	100	89
1926	...	113	82	79	86	105	82
1927	...	109	100	108	101	108	100
1928	...	111	89	112	107	111	92
1929	...	117	105	117	104	117	104
1930	...	—	92	—	106	—	94

VESSELS ARRIVING IN BALLAST.

1924	...	100	100	100	100	100	100
1925	...	94	85	100	92	96	88
1926	...	68	40	67	70	67	44
1927	...	99	90	107	113	102	99
1928	...	103	91	108	112	105	100
1929	...	113	100	117	122	114	109
1930	...	—	95	—	116	—	104

VESSELS DEPARTING WITH CARGOES.

1924	...	100	100	100	100	100	100
1925	...	97	85	100	97	97	88
1926	...	75	44	78	53	75	46
1927	...	99	89	107	111	100	94
1928	...	101	89	111	123	103	97
1929	...	108	100	115	139	110	109
1930	...	—	89	—	134	—	99

VESSELS DEPARTING IN BALLAST.

1924	...	100	100	100	100	100	100
1925	...	100	85	100	90	100	87
1926	...	135	93	68	42	106	71
1927	...	115	122	106	92	111	109
1928	...	119	110	108	86	114	99
1929	...	125	101	117	98	122	100
1930	...	—	116	—	92	—	106

TABLE 5.

Unit = 1,000,000 tons.

Year.	Total Net Tonnage of Vessels departing.	Foreign Trade.			Coastwise Trade.		
		Coal and Coke Exports. — Cargoes.	Estimated Net Tonnage required to carry Coal and Coke.	Col. 3 as percentage of Col. 1.	Coal and Coke Exports. — Cargoes.	Estimated Net Tonnage required to carry Coal and Coke.	Col. 6 as percentage of Col. 1.
	1.	2.	3.	4.	5.	6.	7.
NORTH EAST COAST.							
1924 ...	21.34	22.40	9.74	46	7.84	3.27	15
1925 ...	18.72	17.95	7.82	42	7.63	3.18	17
1926 ...	11.03	7.30	3.17	29	3.75	1.56	14
1927 ...	20.90	19.31	8.40	40	8.91	3.71	18
1928 ...	20.82	18.91	8.22	39	9.88	4.12	20
1929 ...	22.77	22.18	9.64	42	11.40	4.75	21
1930 ...	21.49	19.90	8.65	40	10.82	4.51	21
UNITED KINGDOM.							
1924 ...	158.01	64.46	28.03	18	14.77	6.15	4
1925 ...	155.37	52.93	23.01	15	14.41	6.00	4
1926 ...	138.38	21.36	9.29	6.7	7.63	3.18	2
1927 ...	165.44	52.95	23.03	14	16.37	5.42	3
1928 ...	170.23	52.65	22.90	13	17.23	7.18	4
1929 ...	180.90	63.17	27.46	15	18.99	7.91	4
1930 ...	—	57.34	24.94	—	18.46	7.69	—

N.B.—Columns 3 and 6 are based on calculations made of the relation between the tonnage of coal and coke shipped and the net tonnage of coal and coke shipped and the net tonnage of vessels departing with cargoes at Blyth (including Amble) and Hartlepool. At both ports over a number of years there was remarkably small deviation from the factors 2.3 and 2.4 for the tons of coal shipped per net tonnage of shipping in the foreign and coastwise trades respectively. It has been considered reasonably accurate to use these factors in relation to the total shipments from the N.E. Coast and from the United Kingdom.

TABLE 6.—*London and North Eastern Railway (N.E. Area).*

A=Tonnage of Freight Traffic Originating.

B=Three Monthly Moving Average of Tonnage Originating per working day.

Unit=1,000 tons.

Month.	No. of working days.	Coal Class.		Minerals and Merchandise. (CL 1-6).		Merchandise (Exo. CL).	
		A.	B.	A.	B.	A.	B.
1929.							
January ...	27	3,313	—	716	—	724	—
February ...	24	3,039	124.8	653	28.4	617	26.5
March... ..	26	3,259	124.1	814	31.6	699	26.9
April	26	3,130	122.5	933	33.7	727	27.2
May	27	3,285	122.3	915	34.3	727	26.9
June	25	3,121	124.8	825	33.6	644	27.7
July	27	3,452	125.9	918	33.2	715	25.8
August	27	3,370	126.9	881	34.2	675	26.1
September ...	25	3,205	128.7	904	35.0	670	26.1
October	27	3,574	133.3	977	36.5	719	27.0
November ...	25	3,488	134.0	929	35.2	688	26.0
December ...	25	3,260	133.3	801	33.2	597	25.7
1930.							
January	27	3,519	130.6	823	31.2	691	25.1
February ...	24	3,149	129.3	746	31.2	617	25.7
March... ..	26	3,290	123.0	835	30.8	674	25.0
April	26	2,910	118.3	756	30.0	608	24.3
May	27	3,146	110.9	770	28.0	640	23.0
June	25	2,595	108.7	655	26.1	544	22.6
July	27	2,849	103.4	634	23.3	598	21.6
August	26	2,623	105.1	525	22.4	541	21.5
September ...	26	2,828	107.5	608	22.8	558	21.6
October	27	3,036	112.4	667	23.6	608	22.0
November ...	25	2,903	116.3	563	23.4	553	21.9
December ...	26	3,131	115.7	597	22.1	545	21.5
1931.							
January	27	2,994	113.1	563	21.5	575	21.0
February ...	24	2,590	109.8	493	20.9	494	21.0
March... ..	26	2,875	106.1	553	20.6	545	20.6
April	26	2,601	100.9	516	20.5	523	19.8
May	26	2,395	95.4	528	20.2	474	19.2
June	26	2,442	92.5	532	20.6	503	19.0
July	27	2,469	91.2	571	19.5	520	19.2
August	26	2,291	—	441	—	490	—

TABLE 8.—Goods Vehicles.

Number of licences current during the quarter ended 30th September for the years 1926-1930, also the total and average estimated underladen weight.

NORTH EASTERN AREA.

Year.	Licences current.	Total Estimated Weight.	Weight per Vehicle.
	Number.	Tons.	Tons.
1926	9,078	17,407	1·92
1927	9,779	18,035	1·84
1928	10,396	18,977	1·83
1929	11,475	20,892	1·82
1930	11,996	21,687	1·80

NORTH EASTERN AREA.

TABLE 9.—A. Average number and estimated tonnage per day of goods motor vehicles passing selected points on Class I Roads in August, 1925 and 1928.

County.	Number.		1928 Percentage of 1925.	Tonnage.		1928 Percentage of 1925.
	1925.	1928.		1925.	1928.	
Durham ...	11,362	16,048	141·24	74,016	91,175	123·18
Northumberland	4,025	5,220	129·69	25,741	27,666	107·48
Yorkshire (N.R.)	2,117	3,065	144·31	12,510	16,825	134·49
Total ...	17,504	24,323	138·96	112,267	135,666	120·84

B. Average number and estimated tonnage per day of goods motor vehicles passing selected points on Class II Roads in August, 1926 and 1929.

County.	Number.		1929 Percentage of 1926.	Tonnage.		1929 Percentage of 1926.
	1926.	1929.		1926.	1929.	
Durham ...	4,265	6,465	151·58	26,424	29,005	109·77
Northumberland	2,031	2,794	137·57	12,942	11,337	87·60
Yorkshire (N.R.)	225	349	155·11	1,367	1,642	112·80
Total ...	6,521	9,608	147·34	40,733	41,884	102·83

TABLE 10.—Road Transport.

	Insured Persons.	Employed Persons.	Unemployed Persons.
1924	5,290	4,096	1,194
1928	6,550	5,078	1,472
1929	7,340	5,533	1,807
1930	7,780	5,703	2,077
1931	8,450	6,035	2,415

Estimated capacity, 7,000.

Tramway and Omnibus.

	<i>Insured Persons.</i>	<i>Employed Persons.</i>	<i>Unemployed Persons.</i>
1924	5,520	5,212	308
1928	6,900	6,411	489
1929	8,580	8,200	380
1930	9,180	8,557	623
1931	9,800	8,980	820

Estimated capacity, 9,500.

Transport, Communication, and Storage.

	<i>Insured Persons.</i>	<i>Employed Persons.</i>	<i>Unemployed Persons.</i>
1924	500	459	41
1928	450	385	65
1929	360	309	51
1930	340	239	101
1931	360	233	127

Estimated capacity, 300.

XII (b)—WORLD'S DEMAND FOR MERCHANT SHIP TONNAGE.

(Memorandum by Sir Westcott Abell.)

About the end of 1919 I completed some calculations which had for their object an attempt to estimate over a period of years the average demand for ordinary merchant shipping. It was realised that taking the world as a whole, i.e., apart from the activities of particular countries, there must be some general equilibrium between the supply and demand for merchant shipping. Some of the main factors of the problem are contained in a paper which I read before the Institute of Naval Architects in 1922, "Merchant Shipping and World Commerce in Relation to Sea-Power."

According to this estimate, the principal demand may be expressed as a mean equilibrium curve, combined with a regular fluctuation over a relatively small period of about six years. This periodic fluctuation was obtained partly by general analysis and partly by taking account of the characteristics of the curve of shipbuilding output in pre-war years. This curve of demand being obtained, a further attempt was then made to ascertain the world's demand for new ships, which was reached by taking account of the following factors:—

(1) The normal rate of development shown by the average curve and the fluctuation about that average curve.

(2) An estimate of the average annual rate of loss of ships based on the pre-war figures.

(3) An estimate of the amount of tonnage which was broken up on account of obsolescence or other factors of depreciation, again based on previous rates.

At the time the estimate was made, that is to say in 1919, the movement of goods in the world was not hampered very much by financial difficulties, nor was it as yet complicated by the desire of particular nations to become more important ship-owning communities than they were previously. The position was later complicated also by the fact that the United States, Japan, and to a lesser extent other countries had added to their shipbuilding plant as a result of the increased demand for ships beginning in 1917. The British, very soon after the end of the War, stopped their output of war requirements as quickly as they could, but other countries were not so successful, particularly the United States, which went on for an appreciable time. In 1919 there were produced no less than 7.1 million tons gross of new ships, and in 1920 no less than 5.9, and this although by 1919 the available world tonnage was practically as much as it was in 1914, i.e., the huge war losses had already been replaced. The position was also complicated by the growth in the demand for oil tankers, of which there were nearly three million tons in existence in 1919, which grew until in the corresponding period of 1931 there were about $8\frac{3}{4}$ million tons.

Under these circumstances, therefore, an estimate of the demand for new ships from the curve of world demand for actual tonnage was liable to appreciable error, particularly as regards time, but on the whole, as the diagram shows, there is general agreement in amount when taken over the whole period.

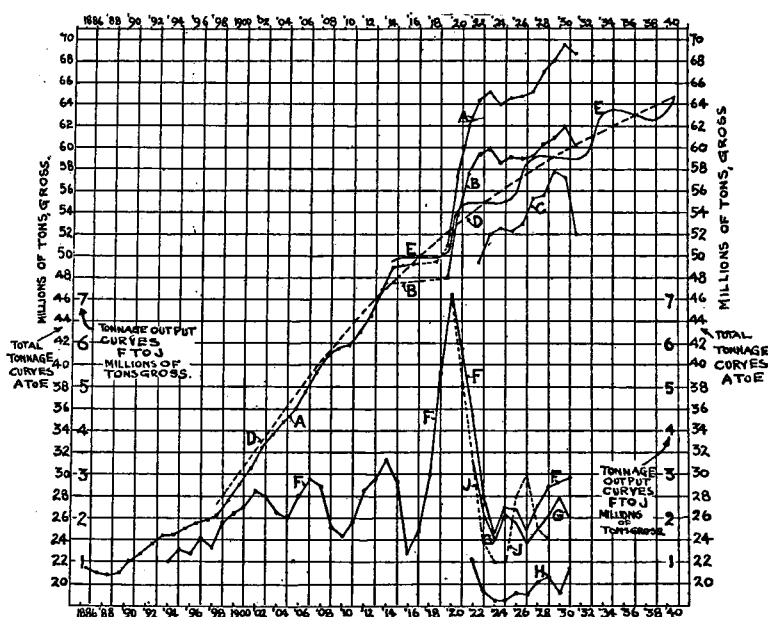
On two occasions since the estimate was made the curve of average demand for tonnage has been checked by a survey of the conditions existing at the time, and roughly speaking, the figures agreed within about half a million tons.

At the request of Professor Hallsworth I again examined the work that was done in 1920 and in accordance with his wish have made some endeavour to extrapolate the curve up to 1940. In doing so I have found it desirable to deduct the oil tanker tonnage from the total tonnage, since this can only be used for the carriage of one particular commodity, and should therefore be treated as a separate problem. Making this deduction, it will be seen that the curve for the world demand lies reasonably between two curves, viz., that of the total tonnage existing, and the same curve after allowance has been made for the vessels that are known to be laid up. I think this is a reasonable assumption, because there is always a tendency to provide more tonnage before it is needed, and especially because the amount laid up has been increased of late years by the obstacles placed in the flow of international sea-trade.

I think, therefore, used with judgment, the curve of average demand for world tonnage will be distinctly of help, as giving a guide to those in the industry as to what fluctuations in conditions they may have to expect.

Professor Hallsworth also asked me whether I could, as I had done before, attempt to make an estimate of world shipbuilding. I must confess it was not easy when this was done in 1919 under conditions which were relatively those of free movement. With the position to-day, of restricted movement, of superfluity of tonnage existing quite apart from economic justification, and of the continuation in existence of many ships which are long over-due for replacement, I feel that the task is comparatively hopeless, and would not be of any material help to those engaged in shipbuilding.

WORLD'S DEMAND FOR MERCHANT SHIP TONNAGE.



- CURVE A shows the total World's Shipping Tonnage. (Gross)
- " B shows in 1914 and since 1919 the World's Shipping Tonnage, excluding Tankers.
- " C shows since 1922 the World's Shipping Tonnage, excluding Tankers, after deducting the Tonnage of Vessels, excluding Tankers, known to be laid up.
- " D is the calculated mean equilibrium curve of the World's demand for shipping.
- " E shows from 1914 to 1940, the estimated World's demand for shipping.
- " F shows the total Yearly Tonnage Output in the World.
- " G shows since 1921 the Yearly Tonnage Output in the World excluding Tankers.
- " H shows since 1921 the Yearly Tonnage Output in the World of Tankers only.
- " J shows the estimate made in 1919 of the Yearly Output after that date.

XIII (a).—GAS SUPPLY ON THE NORTH EAST COAST.
(Memorandum by The Newcastle-upon-Tyne and Gateshead Gas Company.)

The sales of gas by statutory undertakings in Great Britain have shown great expansion as the following figures indicate :—

1902	...	...	144,000	million c. ft.
1912	...	...	194,000	" "
1922	...	...	232,603	" "
1930	...	...	289,991	" "

The latest published number of consumers of such undertakings is 9,343,834 and the consumption 31,000 cubic feet per consumer.

The corresponding figures for the North East Coast (comprising 40 undertakings) are :—

1902	...	...	7,264	million c. ft.
1912	...	...	8,809	" "
1922	...	...	10,459	" "
1930	...	...	12,276	" "

The number of consumers is 504,704 with a consumption of 24,000 cubic feet per consumer.

The percentage of increase is less than for the whole country and the consumption per consumer is smaller owing to coals being supplied free to miners and at comparatively low prices to other residents and industrialists.

The number of undertakings is large for the total quantity of gas sold. To connect them all up and make one or even a few manufacturing stations for the supply of the whole would not be economic as the capital expenditure would cost more than the savings obtainable, but to concentrate the control and management in a fewer number of undertakings is a different matter.

The following shows the undertakings in the Area which buy their supplies of gas wholly or partially from coke ovens, and the quantity so purchased :—

Newcastle	...	...	2,448	million c. ft.	44	per cent. of total requirements.
Middlesbrough	...	...	1,144	" "	100	" " " "
Redcar	...	...	164	" "	100	" " " "
Houghton-le-Spring	...	...	86	" "	100	" " " "
Cleveland	...	...	26	" "	100	" " " "

The purchase of gas from the coke ovens by gas undertakings instead of manufacturing it at the gas works reduces the number of employees at the latter which does not correspond with the increase in number of employees at the coke ovens; but such arrangements lower net costs to the gas undertakings and consequently the price to consumers, and make coke oven operations more profitable.

A large proportion of the residual coke made at the gas works on the North East Coast is exported—principally to Scandinavia. The tar is generally sold to tar distillers except in the cases of Newcastle and Stockton which undertakings themselves distil the tar.

The largest gas undertaking in the Area is the Newcastle-upon-Tyne and Gateshead Gas Company—the fifth largest gas undertaking in the provinces. It supplies an area 20 miles from north to south and 20 miles from east to west including the whole of the industrial portion of the Tyne with the exception of a part on the south side supplied by the South Shields Gas Company. It supplies 195,000 consumers through 80,000 quarterly meters and 115,000 prepayment or penny-in-the-slot meters. There are 160,000 gas cookers and 80,000 gas fires in use in its area.

Since 1920 about 30,000 houses have been erected in the Newcastle Company's area and 96 per cent. of these are supplied with gas.

Notwithstanding the industrial depression during the last five years and the consequent reduction in the use of gas in many individual factories the total sales of the Newcastle Company have increased.

Gas is used for a great many industrial purposes on the North East Coast but owing to the heavy nature of the industries its use has not been as great in proportion to total sales as in such cities as Birmingham and Sheffield, where there are more of the smaller trades. The Newcastle Company, however, have recently set up a special department with expert staff for dealing with industrial business and have also offered special scales of charges (see attached scales) in order to attract industrial business. The result has been very gratifying. Gas is being used in processes in which it has not hitherto been used.

During 1931 the gas undertakings on the North East Coast have instituted a co-operative arrangement for dealing with sales of gas for industrial purposes as many cannot justify the expenditure involved in setting up separate expert staffs. By payment they can (1) call for information from the experts of the Newcastle Company, (2) ask for visits of the latter, and (3) take customers to the Newcastle Company's furnace demonstration laboratory to inspect furnaces in operation.

Gas is now being used in heat treatment processes covering all branches of metallurgical heating, the manufacture of zinc oxide and varnish, Lehr and glory hole heating and small "batch" melting in glass making, steam plants, large scale bread baking, and toffee manufacture. It is also being used for heating retorts in one of the gas works at Newcastle.

Negotiations are proceeding for several other processes, some of which will require annually 20 to 50 million cubic feet of gas each.

NEWCASTLE-UPON-TYNE AND GATESHEAD GAS CO.

Charges in Newcastle Area.

FLAT RATE CHARGES SUBJECT TO:—

DISCOUNT (for early payment) off amount for Gas only.

Consumption per quarter and <i>pro rata</i> for other periods:—	PER THERM. d.
Up to 2,000 therms	10% = 7·2 net.
If over 2,000 therms but under 50,000 therms	15% = 6·8 "
If exceeding 50,000 therms	20% = 6·4 "
By Gas Engines with separate meters	20% = 6·4 "

SPECIAL CONTRACT CHARGES.

A fixed charge of 10s. net per quarter for each service pipe on consumers premises and the following scale of charges for gas:—

Where total consumption is in more than six separate premises:—	Consumption per quarter and <i>pro rata</i> for other periods.	Current flat rate charge per therm <i>less</i> the following re- bates and 10% DISCOUNT for early payment.
		d.
	For first 2,000 therms	1d. per therm = 6·3 net.
	For next 48,000 "	1½d. " = 5·85 "
	For all in excess	2d. " = 5·4 "

Where total consumption is in not more than
six separate premises:—

Consumption per quarter and <i>pro rata</i> for other periods.	d.
For first 2,000 therms	1d. per therm = 6·3 net.
For next 48,000 "	1½d. " = 5·85 "
" " 20,000 "	2d. " = 5·4 "
" " 10,000 "	3d. " = 4·5 "
" " 20,000 "	3½d. " = 3·825 "
For all in excess	4d. " = 3·6 "

For contracted minimum quantities of 100,000 therms per annum consumed in the Newcastle area in special furnaces to be scheduled in the contracts, 2·475d. per therm net subject to rise and fall in price of coal.

Consumers who wish to take advantage of the Special Contract Charges must sign special forms of contract.

XIII (b).—ELECTRICITY SUPPLY ON THE NORTH EAST COAST.

(Memorandum by the Newcastle-upon-Tyne Electric Supply Company Limited, and its Subsidiary Companies.)

This Memorandum has been prepared with a view to showing as far as possible the increasing part that the Companies have taken in the industrial organisation of the North East Coast during the last ten years, and at the same time to show the tendencies which have taken place in the stable industries of the district.

The Companies which are at present associated, and to amalgamate which steps are now being taken, are as follows :—

Newcastle-upon-Tyne Electric Supply Co., Ltd., The County of Durham Electric Power, Supply Company, County of Durham Electrical Power Distribution Co., Ltd., The Northern Counties Electricity Supply Co., Ltd., The Cleveland and Durham County Electric Power Company, Cleveland and Durham Electric Power, Ltd., Houghton-le-Spring and District Electric Lighting Co., Ltd., Carville Site and Power Company, Ltd., Tees Power Station Company, Ltd.

The area over which the Companies hold statutory rights extends from Berwick in the north to York and Harrogate in the south, and from the North Sea on the east to the borders of Cumberland and Westmorland in the west, but in parts of the area the distributing authority is an independent undertaking and in the majority of cases a local government authority. The statistics mentioned below refer only, however, to the load distributed directly by the Companies.

There are 25 of these independent authorities, but 17 of them take their supply in bulk from the associated companies, their consumption having increased by 148 per cent. in the last 11 years, and including these, the Companies are responsible for the generation of about 85 per cent. of the output of all the authorised undertakers in the area.

The area in question falls into two distinct categories: (a) the congested industrial districts consisting of some 610 square miles, and about 2,000,000 inhabitants, and (b) the sparsely populated countryside district, a large part of which is moorland, accounting for 5,011 square miles and about 675,000 inhabitants.

The Companies own four large main power stations, with a present installed total generator capacity of 377,000 h.p., but with site room for development up to about 777,500 h.p.

In addition, there are 14 stations dependent on waste heat and gases, owned and/or operated by the Company, with a total installed generator capacity of some 101,000 h.p. The maximum demand on the Companies' system has risen, as shown on Table I., the units sold (expressed as a percentage) in each year also being shown on this table.

TABLE I.

Year.	Maximum Demand H.P.	Units Sold, expressed as a percentage of 1921 Sales.	Connections H.P.	Number of Consumers.
1921	173,400	100	494,180	23,160
1922	190,100	116	527,893	24,558
1923	220,300	135	569,165	26,950
1924	232,000	151	598,847	30,197
1925	225,500	149	626,689	36,025
1926	224,100	134	657,451	52,752
1927	243,900	167	687,559	65,406
1928	244,500	178	716,678	77,350
1929	267,329	188	739,355	85,262
1930	247,000	164	752,800	99,619
1931	218,500	154	785,688	117,868

The whole of the industrial area and a very large part of the countryside area is catered for by mains which have been added to continuously during the last thirty years. The mileages of mains are shown on Table II.

TABLE II.—Cables Laid.

Voltage.	Up to 1923.			Up to 1930.			Up to 1931.		
	Under-ground.	Over-head.	Total.	Under-ground.	Over-head.	Total.	Under-ground.	Over-head.	Total.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
66,000 ...	—	—	—	11·89	78·56	90·45	11·89	78·56	90·45
20,000 ...	247·85	102·12	349·97	284·94	221·43	506·37	288·36	246·43	584·79
11,000 ...	120·29	21·86	142·15	134·23	65·13	199·36	145·33	86·42	231·75
6,000 ...	203·41	16·67	220·08	237·73	23·25	260·98	239·99	26·86	266·85
3,000 ...	73·95	13·70	87·65	80·92	19·89	100·81	86·51	23·76	110·27
Low ...	348·38	56·01	404·39	631·02	269·39	900·41	653·04	306·96	960·00
Totals	993·88	210·36	1,204·24	1,380·73	677·65	2,058·38	1,425·12	768·99	2,194·11

Capital.—The capital expenditure of the Companies has risen from 8½ millions at the end of 1921 to nearly 14 millions in 1931, due largely to the increase in the extent and capacity of the transmission and distribution system. This system is now such as will cater easily and cheaply for a considerable growth of new load.

Staff.—The total number of the Companies' employees has increased from 1,604 in 1921 to 2,537 in 1931, the classifications since 1926 being as in Table III.

TABLE III.

		<i>Number.</i>		<i>Increase over 1926 staff</i>
		<i>Salaried.</i>		<i>assuming 1926 = 100.</i>
1926—Male	... ..	642		100
Female	... ..	162		100
1927—Male	... ..	711		111
Female	... ..	170		105
1928—Male	... ..	758		118
Female	... ..	190		117
1929—Male	... ..	790		123
Female	... ..	191		118
1930—Male	... ..	828		129
Female	... ..	216		133
1931—Male	... ..	823		128
Female	... ..	223		138
<i>Skilled.</i>				
1926—Male	... ..	557		100
Female	... ..	2		100
1927—Male	... ..	560		100.5
Female	... ..	2		100
1928—Male	... ..	582		104
Female	... ..	2		100
1929—Male	... ..	541		97
Female	... ..	2		100
1930—Male	... ..	514		92
Female	... ..	2		100
1931—Male	... ..	590		106
Female	... ..	2		100
<i>Unskilled.</i>				
1926—Male	... ..	852		100
Female	... ..	19		100
1927—Male	... ..	803		94
Female	... ..	44		232
1928—Male	... ..	750		88
Female	... ..	41		216
1929—Male	... ..	812		95
Female	... ..	43		228
1930—Male	... ..	839		98
Female	... ..	49		258
1931—Male	... ..	811		95
Female	... ..	59		310

The Companies have a scheme for the training of post graduate students, the number under training varying from between ten and twenty-nine (the present and highest number). A number of these remain in the Companies' service when their indentures are completed, and it has been noticed that nearly all of those who do not do so obtain situations abroad.

The type of load dealt with can be split up into the following main headings :

Collieries.	Railway Traction and Tramways.
Steelworks and Ironworks.	Chemical Works.
Ironstone Mines and Quarries.	Domestic and Business Lighting and Heating.
Shipbuilding.	Farms.
Engineering Works.	
Miscellaneous Manufactories, and Small Works.	

Collieries.—Of the collieries in the Area, 182 are now supplied by the Companies (apart from those supplied by independent undertakers), and of these 35 per cent. (52) are completely electrified. There are only a few pits of any magnitude which are not at present supplied by the Companies. Many of the collieries generate a certain amount of their own power, there being about 112,000 h.p. of private colliery generating plant still in existence. This figure shows a distinct tendency to decline, about 20,000 h.p. already being scheduled for closing down, and it is confidently expected to add a further large amount to this very shortly. Table IV. shows the percentage increase per annum in units sold to collieries.

TABLE IV.—Particulars of the Electrification of Collieries.

Year.	Units Used, expressed as a percentage of 1921 Consumption.	Year.	Units Used, expressed as a percentage of 1921 Consumption.
1921	100	1927	174
1922	135	1928	171
1923	161	1929	171
1924	170	1930	175
1925	157	1931	177
1926	127		

An interchange of power between colliery power stations and the Companies' transmission system takes place in a few instances.

There remains some 200,000 H.P. of steam-driven plant in collieries within the area supplied by the Companies, but it is considered that this will be a gradually reducing amount since electrification provides the means whereby colliery owners can improve the efficiency of underground working in such directions as coal cutting, haulage, conveying, pumping, etc.

The use of electrically-driven coal cutters and conveyors below ground has, we think, been responsible for increasing the output per man-shift worked, and it is generally considered that while this has resulted in reduction in the numbers employed, its major effect has been the keeping open of many pits which would otherwise have been uneconomic and so closed down.

A very small proportion of the plant installed for the electrical working of collieries has been bought on the North East—the only equipment made in that district which has any extensive sale being switchgear. The probable reason for this is that motor manufacturers are centred in the Midlands, and also that below ground uses of electricity were first chiefly developed in other districts, notably Scotland; mention should, however, be made of the fact that electric motors of nearly all descriptions are now being made in the Area by an old established firm which shows that there is no doubt that the resources and the skill for making any type of mining machinery do exist in plenty on the North East Coast.

Steel Works and Ironworks.—It is not possible to give accurate or comparative data for the connections and units sold to ironworks and steelworks, since many such establishments have generating plant of their own for the disposal of their waste heat and gases, but are connected as well to the Companies' mains for interchange purposes and standby.

There is a large potential increase in demand for electricity by this type of consumer resulting in considerable economies to them, but this is a matter which is intimately bound up with the existing layout and the reorganisation of the works in question. Such reorganisation has, it is understood, been held up due to the very large amount of capital required to carry out any effective alterations. (See the Chairman of Messrs. Dorman Long & Co.'s speech to the Shareholders, 15th December, 1931.)

Ironstone Mines and Quarries.—The majority of working ironstone mines, limestone quarries and whinstone quarries, take supplies of electricity from the Companies, these supplies supplanting, to a large extent, individual generation by small oil or steam plants. Table V shows the percentage increase per annum in units sold to these consumers. A further five whinstone quarries are about to be connected, representing a further 1,300 H.P. connections and a consumption of about 1,200,000 units a year.

The development of the ironstone mine and limestone quarry load depends entirely on the future of the iron and steel trades while that of the whinstone quarries would appear to depend on the national policy as regards road making and road maintenance.

In general, the electrification of an ironstone mine or a quarry assists in its development, and therefore leads to the employment of more labour if the demand for the stone is present.

The greater part of the above type of load is situated on and beyond the fringe of the industrial area, and the electrification of this therefore tends to the electrification of otherwise uneconomic districts.

TABLE V.—Particulars of the Electrification of Ironstone Mines and Quarries.

		Ironstone Mines. Units Used, expressed as a percentage of 1921 consumption.	Quarries. Units Used, expressed as a percentage of 1921 consumption.			Ironstone Mines. Units Used, expressed as a percentage of 1921 consumption.	Quarries. Units Used, expressed as a percentage of 1921 consumption.
1921	...	100	100	1927	...	150	186
1922	...	103	110	1928	...	147	170
1923	...	134	172	1929	...	153	321
1924	...	131	142	1930	...	147	328
1925	...	135	142	1931	...	123	406
1926	...	107	93				

Shipbuilding.—One of the earliest developments of the Companies was that of the supply of electricity to shipyards and there are now no shipyards within the area of supply which do not rely on the Companies for their power.

Engineering Works.—Nearly all manufacturers of heavy engineering products depend on the Companies for their power but figures of their demands on the Companies vary with the state of trade in the industries for which the particular works cater.

Thus the demands made by marine engineering would be found to follow closely the output of new tonnage from local shipbuilding yards, and have so been sporadic, while the demands made by electrical engineering have increased very rapidly in close relationship to the great activity in the installation and re-equipment of electrical generating stations throughout the country.

In general, the electrical engineering industry in the district caters for the heavier type of plant, and the increase in their use of electricity cannot perhaps be expected to be maintained in the near future. The output of this side of the industry has been accelerated of late years by the operations of the Central Electricity Board and by the Change of Frequency, and it is anticipated that a period will shortly commence during which the output of electricity will have to reach the capacity of the plant recently, or about to be, put into commission, before any orders of any magnitude are placed for the heavier type of plant such as is made on the North East Coast.

It may here be mentioned that so far as is known, the three electrical engineering firms in the district are independent of any of the large amalgamations that have taken place in that industry in this country of recent years.

The use of electricity is continually being extended in all the manufacturing processes, two of the more outstanding being for handling and for heating. That of heating is continually being

extended in most manufacturing processes, and in this connection is supplanting other forms of fuel for such purposes as heat treatment of metals, glass, etc., melting, welding, steam raising, etc.

We are of the opinion that this class of load is a field in which there will be a large expansion in the future.

Table VI shows the typical growth in consumption at the three groups of works under consideration.

TABLE VI.—*Showing trend of Consumption expressed as a Percentage of the 1921 Consumption of Electricity at typical Groups of Engineering Works.*

				<i>General Engineering. (6 Consumers).</i>	<i>Electrical Engineering. (3 Consumers).</i>	<i>Marine Engineering. (6 Consumers).</i>
1921	...	...	...	100	100	100
1922	...	...	...	79	92	75
1923	...	...	...	87	151	80
1924	...	...	...	116	200	97
1925	...	...	...	139	199	97
1926	...	...	...	103	174	98
1927	...	...	...	110	232	131
1928	...	...	...	122	234	120
1929	...	...	...	138	218	140
1930	...	...	...	120	306	139
1931	...	...	...	86	363	84

Although the Companies have no record of the outputs from the works in question, it would appear that due to the application of machinery in the works, the use of electricity has grown to a relatively greater extent than has the output from the groups of industries.

Miscellaneous Works.—The Companies supply electricity to a very large number of the comparatively smaller trades, and owing to the extensiveness of their cable system are in a position to give power supplies of almost any magnitude at attractive rates in any part of their area. It is not possible to segregate the quantities of electricity used in the various groups of smaller industries and at the same time to arrive at truly comparative figures, but in general it can be said that those trades which have made liberal use of the advantages which electrical re-equipment offers have been the more consistently prosperous. Particular mention might be made of such trades as glass making, wood-working, paint making, paper making, printing, confectionery making, and laundries.

The following is a list of some of the new works and extensions to existing works for new products which have been started in the Companies' area in the last two or three years. The approximate horse power shown in each case is to give an indication of size, but it will be appreciated that many of these works may grow to be considerably larger.

Index Number.	Business.	Horse Power Connected	Remarks.
1	Soap manufacture	300	This is understood to be for the production of a new class of material.
2	Production of zinc oxide ...	40	A new industry to the district.
3	Patent concrete bricks ...	7	A new product.
4	New Aircell Insulating products.	—	A new product.
5	Manufacture of Taylor Stokers.	151	This is to deal with a new line of business.
6	Optical lenses, telescopes, etc.	—	Transferred from the Midlands.
7	Sheet steel bracing pieces, used in box making and other timber structures.	10	New business.
8	Paint and varnish manufacture.	70	Restarting by new principals in a new factory of a business previously making varnish only and closed down due to absorption in a larger business.
9	Confectionery	40-50	New industry.
10	Pasteurised ice cream ...	30	Ice Manufacturers who are installing Pasteurising Plant of which there is only one other in use in the Country. This ice cream will be retailed over a large area in the North of England.
11	Extension of plant for a new process in the manufacture of coloured glass.	15	Old established Glass Works, but this represents a new line of business.
12	Printing	16	Offshoot from existing firm.
13	This product, comprising gannister, silica and sand is used for steel castings.	40-50	Due to an extension in the use of the materials quarried.
14	Manufacture of window frames, doors, and general joinery work for the building trades.	30	New business.
15	Edible fats and soap ...	25	New business.
16	Motor repairs, commutator building, switchgear manufacture, etc.	100	Not fully developed 20 h.p. at present installed.
17	Men's clothing manufacture.	60	A transfer from Leeds.
18	Safety devices for use in connexion with steam plants, pumping plants, etc.	20	A new patent.
19	Treating and bottling milk	20	New business.
20	New premises for the printing of cartons, etc., and coach building works.	100	Extension of previously existing small industry.
21	Cereal grinding	100	New business.
22	Confectionery	About 15	Extension of existing business.
23	Confectionery	10	New business.
24	Pigments, oxides, etc. ...	12	Extension of existing business.
25	Motor bodies	16	New business.
26	Step-ladders, household and garden furniture.	10	New business.

Railway Traction and Tramways.—Two portions of the London and North Eastern Railway system in the Area are electrified, one being for suburban traffic around Newcastle, and one for mineral traffic to Middlesbrough and the load taken by the former has shown a steady but small increase which has partly been offset by a decrease in the latter, due to depression in the iron and steel trades.

There are five small tramway systems supplied. This load has decreased in the past few years, and may be expected to continue to do so as the change to other forms of transport continues.

Table VII. shows the application of this use of electricity in the Area.

TABLE VII.—*Particulars of Supplies to Railway and Tramway Systems.*

Year.	Railways.		Tramways.	
	Units used, expressed as a percentage of 1921 consumption.		Units used, expressed as a percentage of 1921 consumption.	
1921	...	100	...	100
1922	...	105	...	88
1923	...	114	...	95
1924	...	116	...	93
1925	...	116	...	95
1926	...	103	...	98
1927	...	111	...	96
1928	...	115	...	84
1929	...	118	...	100
1930	...	117	...	50
1931	...	132	...	39

Chemical Works.—During the period under review, three large chemical works have been supplied, and the units taken have increased rapidly as shown on Table VIII.

TABLE VIII.—*Particulars of Supplies to Chemical Works.*

Year.	Units Used, expressed as a percentage of 1921 consumption.		Year.	Units Used, expressed as a percentage of 1921 consumption.	
	1921	...		100	1927	...	230
1922	...	122	1928	...	356
1923	...	158	1929	...	390
1924	...	207	1930	...	163
1925	...	232	1931	...	92
1926	...	220			

Owing to change of management and consequent alteration in manufacturing methods, there is now only one of these works connected and the units supplied have shown a large decrease. This, however, has not reacted badly on the Area as a whole, and the total consumption of electricity used in the chemical industry is probably still larger than hitherto since the manufacturers have established a large generating station of their own, using what might be termed "By-Product" steam.

Domestic and Business Lighting and Heating.—A very large increase has taken place in this use for electricity, chiefly owing to the Companies' forward policy of Assisted Wiring which was introduced in 1925. Figures I. and II. (pages 410 and 411) show the very large increases which have taken place under this heading, and also

the reduction in the average price which the consumer has paid. Since the beginning of 1931 a further reduction in the standard rates has been applied with a resultant decrease in average prices.

The development of electric cooking and heating has also progressed at a steady rate.

The decrease in the annual average number of units consumed per consumer over the period under review is due to the connection, through Assisted Wiring, of a large number of even the smallest types of houses from which the income is of necessity restricted.

The chief obstacle to the intensive development of the full use of electricity by poor consumers, is the initial cost of the appliances.

Table IX. shows the Companies' general standard tariff for all domestic uses; in some outlying districts, the charge for the first block of units per quarter is up to 8d. per unit. It will be seen that the greater is the consumption, the lower is the average price which the consumer pays.

TABLE IX.

No. of Assessable Rooms.	Units per quarter at 4d. per Board of Trade Unit.				Next Units per quarter at 3d. per Board of Trade Unit.				Next Units per quarter at 1d. per Board of Trade Unit.				All in excess at 1d. per Board of Trade Unit.
	Mar.	June.	Sept.	Dec.	Mar.	June.	Sept.	Dec.	Mar.	June.	Sept.	Dec.	
4 or less	32	16	16	32	26	13	13	26	500	250	250	500	}
5	38	19	19	38	30	15	15	30	550	275	275	550	
6	50	25	25	50	40	20	20	40	600	300	300	600	
7	64	32	32	64	52	26	26	52	650	325	325	650	
8	82	41	41	82	66	33	33	66	700	350	350	700	
9	102	51	51	102	82	41	41	82	750	375	375	750	
10	122	61	61	122	98	49	49	98	750	375	375	750	
11	142	71	71	142	114	57	57	114	750	375	375	750	
12	162	81	81	162	130	65	65	130	750	375	375	750	
13	182	91	91	182	146	73	73	146	750	375	375	750	
14	202	101	101	202	162	81	81	162	750	375	375	750	
15 or more	222	111	111	222	178	89	89	178	750	375	375	750	

All less 5 per cent. for payment within one month.

Farms.—The units sold and the number of consumers is included under the classification of Domestic and Business Lighting and Heating, but special mention should be made of the growth in the uses of electricity for farm purposes during the past two years.

There are now 226 farms connected to the Companies' mains, being an increase of 127 (172 per cent.) since 1929, and the total connections are now 890 kw., of which 52 per cent. is for power and 24 per cent. for heating purposes.

Among the uses to which electricity is put on the farms supplied by the Companies are :—

Threshing.
Cake Breaking.
Grinding and Crushing Mills.
Hay and Root Cutting.
Elevators.
Pumps.

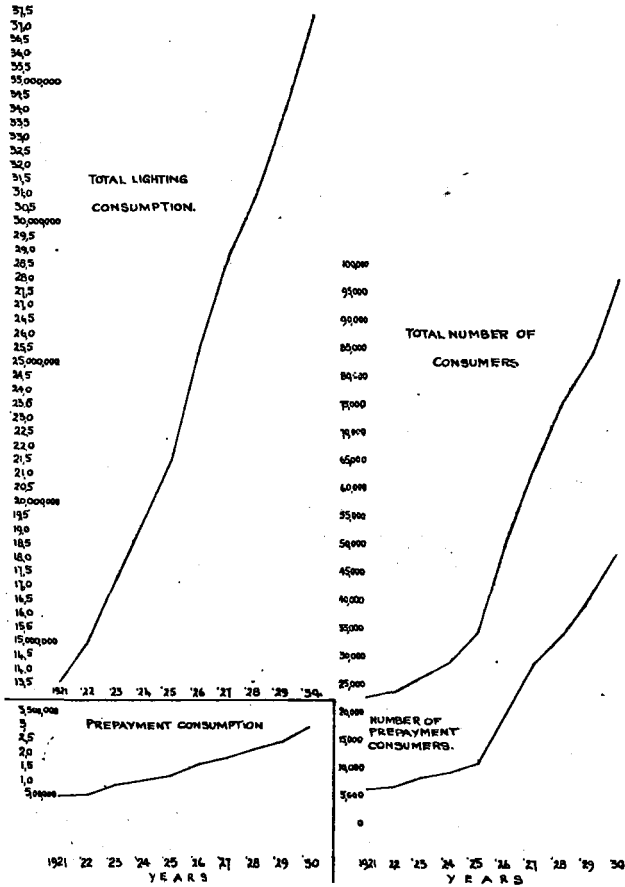
Milking machines.
Saws.
Incubators and Brooders.
House Lighting, Heating and Cooking.
Yard, Shed and Byre Lighting.

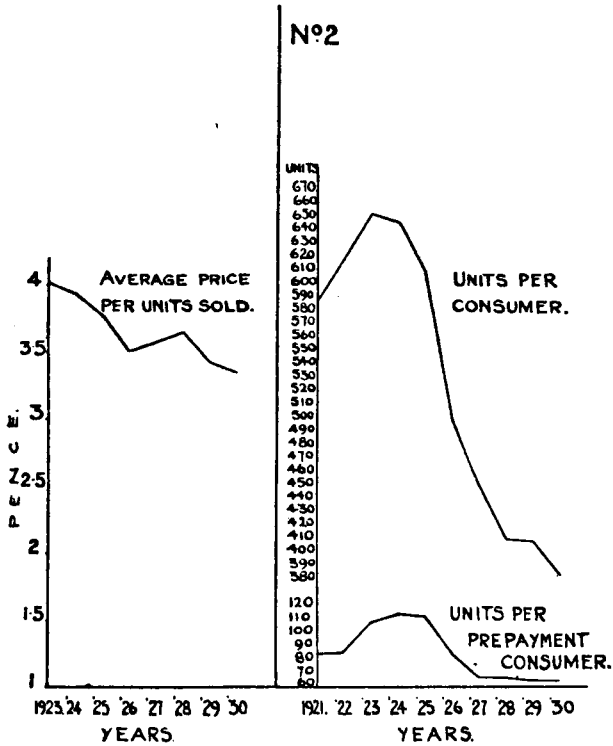
So far as is known, the provision of electricity on farms in the Area has not led to a reduction in the number of employees, the large reduction that has taken place being due to other, and more fundamental, causes.

Farmers have been found to appreciate that the lighting of the farm buildings, cow-byres, sheds and yards, means better and quicker work from employees, and a better arrangement of working programmes. Power for electric motors has also led to more intensive working arrangements and in addition is more cleanly, safer, and more easy of control.

The Companies look for a very considerable increase in this type of load as the advantages become still better known and when the farming industry is in a position to find the limited amount of capital necessary for electrical equipment.

Nº 1.





(XIV) THE DISTRIBUTIVE TRADES.

(Memorandum by Miss E. F. Stevenson.)

(i) Introduction.

Owing to the great number and variety of the facts that ought to have been considered, and the insufficiency of the available information, this part of the Report cannot offer a satisfactory analysis or definite conclusions. For the same reasons very few statistical tables are appended.

The number of persons employed in the Distributive Trades necessarily bears a close relation to general prosperity and productive activity, since consumers can only spend what they have. The effect of general trade depression on the Distributive Trades is checked by unemployment benefit and public assistance, which bring about a transference of national income to the depressed region. Each household has some income to spend; and thus demands the labour of persons engaged in dealing. Such incomes can hardly admit of saving and may be assumed to be spent locally. In

so far as they are provided out of the rates, they constitute a local transference of income, and may result in some increase of spending relatively to saving.

Some part of the larger incomes in any area are certain to be spent outside it, probably in London, which is a trading centre for the whole country. We have no means of estimating the proportion. But Newcastle is an important centre, there are several other large towns in the Area, the co-operative societies are everywhere, and there is a network of motor transport services, enabling every consumer to reach shops and stores. Retail traders are able to offer all that the great majority of buyers require. The really important point is the diminution of purchasing power.

The number of persons engaged in distribution must also depend on population. But all over the country they have increased far more than in proportion to the growth of population; and this is true also of the N.E. Coast Area. This increase may be slower in the future. In any case, movements of population certainly influence the expansion of retail trading. Now housing schemes, for instance, remove consumers from their former shopping centres and lead to the opening of new centres. We cannot say, however, that the exodus of population from this Area has as yet been large enough to influence the number employed.

The third important influence is the organization of the retail trades. Co-operative stores, multiple shops, large and small private businesses are very differently managed. The cost of distribution is not the same for all goods. If it were possible to estimate the amount or the value of general retail sales in a particular town for a given period, this would be some indication of the number of workers required; but it would also be necessary to know what types of business were engaged in selling the goods.

While these types are much the same all over the country, the relative importance of the different forms of organization varies. The outstanding characteristics of this Area are:—

- (1) Co-operative trading is widespread and successful.
- (2) The drapers and department stores are as yet independent of the drapery trusts.
- (3) Multiple trading is gaining ground, especially in the grocery trade, though many well-established private grocery businesses are successful.
- (4) There is a wide-spread system of payment in instalments.

In a time of bad trade it becomes more than ever necessary to keep costs low. Retailers whose costs are high tend to be replaced by businesses of another type. Whether retail prices are too high is a more difficult question. Some goods, butter, for example, are habitually sold without expectation of profit. In the case of others, such as drapery novelties, the margin may be very wide. Traders

assure us that the consumers receive the benefit of falling prices. On the other hand a business man of wide experience in the food trades is convinced that the depression in the Area has been made worse by the operation of monopoly, especially in food, which has held up prices and reduced the buying power already reduced by unemployment.

(ii) Employment and Unemployment.

The figures supplied by the Ministry of Labour are for insured persons. They do not include juveniles or uninsured persons. If we assume that the persons insured in all industries constitute about 70 per cent. of the persons employed, the figure would probably be higher for the distributive trades alone. We have no means of determining it. As the school leaving age rises, and as employers in these trades require a higher standard of education, the juveniles must form a diminishing proportion of the whole number and in a few years there will probably be very few boys and girls under the age of 16 employed. The uninsured persons present more difficulty. We do not know how many persons start retail businesses, often in their own homes, which employ no insured persons, nor do we know how long these businesses survive. Detailed information is only available for firms employing 20 or more insured persons; but it is well known that in times of depression many tiny shops are opened in the hope of making a little extra income.

There is also some transference of labour. When a small trader gives up his own business he is likely to seek employment in a larger shop. He then adds one to the number of insured persons, but not to the number of persons actually engaged in retail trading. The same thing happens when traders in a town increase their activity at the expense of the small village shops. The new workers are insured persons. In so far as juveniles and uninsured workers tend to be eliminated, the official figures approximate to the actual figures.

Unfortunately it is not possible to distinguish accurately between persons engaged in wholesale and in retail trading. It is certain that a large majority is employed in the retail businesses. Some retail traders buy direct from manufacturers, others from wholesale firms outside the Area. In some cases, as in fish buying at North Shields, a small group of wholesalers supplies all the retailers.

With these reservations we may regard the official figures as indicating the position in the trades. The large increase in numbers employed should not, however, be taken as an indication of increasing prosperity. It must be considered together with the organisation of the trades and the conditions of their expansion and contraction. In this connection the bankruptcy figures are important. They show a very much greater number of failures of retail traders in this Area than for the country as a whole. (See Table 4.)

(a) *Numbers.*

Between 1923 and 1931 there has been a large increase both in persons insured and persons employed in the Distributive Trades. This is true for the country as a whole and for this Area. Further, the increase is proportionately greater in these trades than in all trades taken together. The position in the whole country is shown by figures taken from the Statistical Abstract of the Ministry of Labour.

Estimates of Number Insured. Great Britain and Northern Ireland.

	<i>All Trades.</i>	<i>Distributive Trades.</i>		<i>All Trades.</i>	<i>Distributive Trades.</i>
1923 ...	11,485,800	1,253,980	1929...	12,094,000	1,679,090
1924 ...	11,664,000	1,354,910	1930...	12,405,700	1,764,390
1927 ...	12,131,000	1,581,070			

The increase of numbers during the same period in the North East Coast Area is indicated by relating the numbers insured in 1930 to a figure of 100 representing the number insured in 1923.

	<i>1930.</i>	<i>All Trades.</i>	<i>Distributive Trades.</i>
Whole North East Coast Area ...		99·8	131
Sub-areas—			
Ashington		91	105
Bishop Auckland		94	121
Blyth		102	138
Consett		88	159
Darlington		98	157
Gateshead		85	152
Middlesbrough		100·8	139
Newcastle		112	156
South Shields		87	109
Stockton		131	164
Sunderland		96	115
Wallsend		104	116

The growth of Distributive Trades cannot be explained by a growth of population in the Area. The population rose from 2,470,395 in 1921 to 2,495,559 in 1931. The percentage of the total population of England and Wales which this figure represents was 6.5 in 1921 and 6.25 in 1931. The number insured in 1930 in Distributive Trades in the whole country was about 3.8 per cent. of the population while for the North East Coast Area the percentage was 3.4. In 1923 the percentage was 2.8 for Great Britain and Ireland and 2.4 for the North East Coast. It thus seems evident that the number of persons required for distribution is growing. If we take the numbers actually employed, and compare them with the numbers actually employed in all trades, we find that in this Area, while the number in all trades fell from 580,373 in 1923 to 469,331 in 1931, the number employed in Distributive Trades rose from 55,822 in 1923 to 75,671 in 1931.

The reasons for this increase are discussed in the section on Expansion and Contraction. The numbers actually employed in his Area from 1923 to 1931 are shown in Table 1.

(b) Age and Sex.

Most of the persons employed are adults, of whom rather more than half are men. More girls than boys are employed. During the last few years there has been a steady increase in all four classes. Table 1 shows the numbers in all classes for six different years.

While men are proprietors, managers, travellers, roundsmen, warehousemen, shop assistants and labourers, women constitute the majority of shop assistants, and are employed as packers. Employers state that there is an increasing substitution of women for men in shops. For the heavier parts of the work men are preferred. Some employers expressed the opinion that men were better sales assistants than women, and would, if they were as cheap, be preferred, except in certain parts of the drapery trade. It is true that between 1923 and 1931 the number of men and boys increased more than the number of women and girls. This may be due to economy of labour in shops, caused by the installation of modern fittings, and to expansion of labour in the delivery of goods, which is done by men and boys.

Information obtained from the Newcastle Juvenile Employment Bureau indicated that a large number of boys start as errand and van boys, and that more girls go into shops than into any other employment except domestic service. While domestic servants are of all ages, the average age of women in shops is low. The 1921 Census states that in the North East Coast Area out of every 1,000 women over 12, 56 were domestic servants, 28 were shop assistants, and 4 were storekeepers or in warehouses. This Area had a very high proportion of unoccupied women, 791 per 1,000. There is thus a reserve of female labour available for the distributive trades.

The age of entry into the trades is probably rising. Errand boys and girls start work between 14 and 16; but in the shops young people who have had a secondary education are taken on. The recent development of training and educational schemes for sales assistants presupposes an adequate general education.

(c) Regularity of Work.

While there is clearly a considerable amount of unemployment in the Distributive Trades, employers emphasised the point that the regularity is greater than in other occupations, and that these trades are bearing an undue share of the burden of Unemployment Insurance. Men organised in the Trade Unions seem to be on the whole in permanent employment, though they may be replaced by women as they retire from work. The Co-operative Societies, whose employees are organised in the National Union of Distributive and Allied Workers, pursue this policy of gradual replacement without discharge of men. The largest retail business in the Area, a company owning department stores in six towns in the Area, has

not, we are informed by one of their managers, dismissed any sales assistant during the last few years for any reason connected with trade depression.

These statements make the explanation of unemployment figures difficult. It is, however, certain that there is a very real element of casual labour, taken on at Christmas and for sales. A certain amount of the goods sold are made in the shops, and there is seasonal unemployment among the workers employed in this way. It seems likely that while some youths work their way up into permanent employment others are displaced by younger boys. This conclusion finds some support in the sample investigation carried out by the Ministry of Labour.

It was found that 544 male claimants to benefit could be classified by age in the following way :—

<i>Age Group.</i>	<i>Percentage Unemployed.</i>	<i>Percentage divided by number of years.</i>
16 to 17	5.0	2.5
18 to 19	14.5	7.25
20 to 24	21.3	4.3
25 to 29	10.7	2.1
30 to 34	7.4	1.5
35 to 44	15.4	1.5
45 to 54	13.2	1.3
55 and over	12.5	—

The third column, in which the percentage in the group is divided by the number of years in the group, clearly illustrates the tendency for youths to be displaced when they reach the age of 18, and shows that a much smaller proportion are displaced after they reach the age of 24.

In the case of girls the position is different. So many of them leave to be married that they are replaced by younger girls in the natural course of events, without being discharged.

Unfortunately no information is available with regard to the length of periods of unemployment; and without this no definite statements can be made.

(d) *Unemployment.*

The percentage of unemployed persons in the Distributive Trades is lower than in all trades taken together, both in this Area and in the country as a whole. These figures are given for six different years in Table 2. It is evident that the demand for labour is steadier in these trades, which, as we have already shown, absorb year by year an increasing number of persons. In this Area, though rather more men than women are employed, unemployment is highest for men, and is usually lower for boys and girls than for women.

<i>Year.</i>	<i>Men.</i>	<i>Boys.</i>	<i>Women.</i>	<i>Girls.</i>	<i>Total.</i>
1923	7·4	4·8	6·7	5·0	6·8
1924	9·0	5·4	6·5	4·6	7·3
1927	9·27	4·5	5·9	4·6	8·3
1929	12·6	6·3	6·5	4·0	9·1
1930	15·6	6·5	11·3	6·6	12·3
1931	19·0	12·3	13·8	10·0	15·6

The unemployment has been increasing, and is much worse in 1931.

With regard both to number employed and to percentage of unemployment, there are considerable differences between the twelve sub-areas.

	Numbers Employed.		Percentage Increase.	Unemployment Percentages.	
	1923.	1931.		1923.	1931.
Ashington ...	920	957	4	3·1	10·7
Bishop Auckland	1,147	1,304	13	4·4	19·0
Blyth ...	748	914	22	4·1	14·0
Consett ...	592	794	34	3·4	9·7
Darlington ...	1,931	3,096	60	7·1	12·9
Gateshead ...	2,569	3,580	39	13·5	26·9
Middlesbrough ...	4,087	5,358	31	4·5	16·5
Newcastle ...	13,813	22,067	60	7·7	13·0
South Shields ...	3,318	3,705	11	8·0	16·5
Stockton ...	2,173	3,476	60	6·3	13·5
Sunderland ...	6,180	6,666	7	8·4	18·0
Wallsend ...	726	858	18	12·9	20·7

The numbers insured remained so much in excess of the numbers required that in spite of the increase in employment there was a very great increase of unemployment in the Distributive Trades in all the sub-areas. But in general unemployment increased most in the districts which show least expansion of trading. Ashington, Bishop Auckland, South Shields and Sunderland are all depressed sub-areas. Darlington is the least depressed of the twelve. Newcastle is such an important centre that its trading necessarily increased. In Stockton business was kept going by the works at Billingham; but the traders there are now feeling the depression and many shop assistants are working short time.

There is certainly more unemployment than the conditions would seem to indicate. It may be that large numbers of persons try to get employment in the Distributive Trades, prove unsuitable, and fail to get work. The employers say that training is required as well as a natural aptitude, and that it is useless to take on adults who have not learned the work of selling. Undoubtedly, the introduction of modern methods and especially of shop fittings, which enable the assistant to arrange and to see his goods, results in

economy of labour. A draper stated that after re-fitting his shop he found that three girls could manage a counter which had required six. But it is the large shops with modern methods which continually expand and add to the number of their employees. The sales assistants displaced by improvements seem to be re-absorbed. And the fact remains that unemployment is always less in the Distributive Trades than in other trades taken together.

(iii) **The Organization of Retail Trading in the Area.**

Before considering the causes of expansion and contraction of Distributive Trades, it is advisable to give a brief account of the types of organization which prevail.

(a) *The Ticket System.*

This method of credit purchase, called the Club System on Tees-side, is spread over the whole Area. Large quantities of clothing, boots and shoes, and miscellaneous articles are bought in this way, and paid for in weekly instalments. Shops send out agents, who go round the district persuading people to take tickets. If the customer takes a ticket of the value of £1, he pays for it by 21 weekly payments of a shilling. On making the first payment he is entitled to go to the shop and choose what he requires. The firm does not recognise the customers, it deals with the agent, and gives him a discount on the price of the goods, usually $12\frac{1}{2}$ per cent. Out of this and the 5 per cent. paid by the customer for the credit, he makes his income. Drapers and department stores do a great deal of business in this way.

Besides these agents, there are large numbers of "travelling drapers", some in a very small way of business, others with their own stock in their own warehouses. Those who do not keep stock either sell tickets on various shops, settling their accounts monthly and getting a discount of $12\frac{1}{2}$ or 15 per cent., or else go round their districts asking for orders first, and then buying the goods required. In all cases the customers pay by instalments, obtain the goods after the first payment, and pay more than the retail price. If they go to the shops, they obtain the goods at the ordinary cash prices, but they are paying 21 shillings for every pound's worth of goods.

(b) *Co-operative Stores.*

This Area has always been a stronghold of Co-operation, and the movement continues to grow. This is clearly shown in the figures published by the Co-operative Union. The relative position of the northern societies is lower, but this is due to a more rapid recent expansion in the South. (See Table 3).

The difficulty that now confronts the Co-operative Movements is indicated by the statement that "Executive power is vested to

an overwhelming extent in autonomous local units controlling national federations". But the changes that may eventually be made have hardly begun to appear in this Area, and are still in the stage of being discussed in the Co-operative Congress. Undoubtedly the growth of multiple shops is regarded by the local societies as a menace, which their organization will have to meet. Suggestions are made for the amalgamation of societies that are weak, or that have interwoven interests. But there have been very few amalgamations in this Area. Nor is there as yet any national fixing of co-operative prices, or any limitation of dividend. The independent local societies are the strength and the foundation of the movement.

In this Area they have felt the depression acutely in the districts of greatest unemployment. The coal dispute and the general strike involved some of them in financial difficulties. But they have survived. The amount of bad debts does not appear to be great. It is a principle that bad debts should be written off without hesitation. A prominent official stated that in his opinion any embarrassment was due far more to bad management of individual stores than to any other cause. If a society gets into difficulties, it can get help from the Co-operative Wholesale Society's bank, on the security of its property. If it does not regain its position, the C.W.S. intervenes, and takes control. There have been a few instances of societies recovering in this way.

There has not been any real abandonment of the cash basis. The system of mutuality clubs to enable members to pay for goods on a credit system seems to be extensively used in London. Such clubs exist here. A member can get an advance, but not beyond the amount of his share capital in the society; and the clubs are carefully managed. It is also becoming usual for members to pay for their purchases at the end of the week. This may be called credit, but the main point is one of organization. If cash must be paid, purchases will not be made on those days on which buying power is at its lowest point; consequently all the sales will be concentrated on the end of the week. Some economy of staff results from spreading the sales over the whole week. Between 1925 and 1929 the amount of sales per employee has fallen, and the distributive wages per £1 of sales has risen. The Stores have the same problem as other forms of enterprises: how to reduce overhead costs, in a period of low prices and depression.

There is no means of knowing how much is bought by members of societies in shops other than their own stores. Only the amount bought in the store is known. In this respect societies vary widely. If members find more cheapness, more variety, or better satisfaction of their personal wants elsewhere, they go elsewhere. And as long as they go elsewhere, the expansion which might satisfy them cannot easily take place.

A point of some interest is the relation between prices and dividends on members' purchases. The high dividend is advocated in some societies as a good way of saving. Another view is that lower dividends and lower prices would contribute to the lowering of prices in general, and thus through an increase of buying power lead to progress in co-operative trade. This would seem to necessitate the limitation of dividends to some such figure as 2s. in £1.

It is a principle of Co-operation that workers should not be discharged. There are, of course, some deviations in practice. In any case the principle does not prevent the substitution of other labour as vacancies occur. We are, however, informed that the substitution of women for men has not taken place as yet in the grocery departments of the stores. In clerical work there has been considerable substitution. It is probably true that the stores could do a great deal more business without any more staff, and are not likely to increase the numbers they employ, even if there is a considerable improvement of trade in the Area.

(c) *Department Stores.*

These stores are growing much larger in the towns of the North East Coast Area, but have not the great number of different departments usually found in London stores. They do not as a rule sell provisions or fish or meat or fruit, and they do not all sell furniture. Many of them are well established private businesses, which have developed gradually, enlarging their premises and increasing the services and facilities they offer to their customers. Some have stores in more than one town. As a rule they are well managed and well staffed. Nearly all now have cafés, rest rooms, information bureaux, and so on. They have developed systems of delivery which enable them to send goods promptly to customers at considerable distances. They advertise largely, relying most on illustrated advertisements of particular goods, in the local newspapers. In recent years they have increased their cash trade, and they find that customers now prefer to pay cash or to settle their accounts at frequent intervals. Some do a very large business on the "ticket" or "club" system already described. They do not regard this as credit trading, because the agents take the risk of the customers failing to pay.

Among department stores may be included the well known 3d. and 6d. stores and an intermediate variety offering a larger range of drapery goods but not equal in size or scope to the department store properly so called. The most striking characteristic of these cheap stores is that they succeed in depressed districts, where other businesses are contracting. They are multiple shops and can compete with the small specialised shops. The ironmongery shops are said to have been largely driven out of business by them and by the large department stores.

(d) Private Businesses.

The small man finds it more and more difficult to hold his ground. He has to do too much himself. He cannot buy advantageously, or carry a sufficient variety of goods. He can never spend enough on advertising. Nor can he hold out for any length of time without making money. In the country towns and villages he has a better chance than in the large towns. But the large shops in the towns are sending their vans further and further into the country.

Even in the towns a great many small businesses remain. They sell specialised goods, or goods which are demanded by a limited and exacting body of consumers. They are carried on by dealers who can make high profits on a small turnover, or by those who look only for a small reward for their own work. They spring up in newly developed districts, from which they may be eliminated by further developments.

The largest businesses are drapery shops which move with the times and grow into department stores. The private groceries concentrate on the "high class trade," and study the wishes of their customers and the quality of goods. Their customers do not deal much with the co-operative stores or the multiple grocery shops. The division of custom between the private chemists and the multiple drug stores is perhaps rather according to goods required than to a grouping of persons.

(e) Multiple Trading.

Since the War there has been a widespread development of multiple shops in this Area, especially in grocery. It is more marked on Tyneside than on Tees-side. In Middlesbrough and Stockton the private businesses have a larger proportion of the grocery trade than in Newcastle.

Here the point of most importance seems to be economy of management. The typical multiple shop is run by a manager whose duties include the smallest possible element of responsibility; and his assistants are not highly skilled or highly paid. If he works on the stock system, by which the goods are supplied to him from a warehouse at retail prices, his accounting is very simple. He works on a cash basis, he has no buying to do and he incurs no debts. The business is financed from a distance and managed from a distance. The profits go to some one at a distance. In short, the change from independent trading to multiple trading involves the elimination of a skilled occupation—that of owning or managing a business—from the Area. Several persons expressed the opinion that the district was losing trade by the growth of this system, since it gives employment to the minimum number of persons, and only their earnings, not the earnings of the business, are spent in the locality.

(f) *Other Business*

There are also proprietary shops selling their own branded goods, shops acting as agents for branded goods made in factories, agents who buy from factories that do not sell direct to shops, and various types of middlemen.

(iv) **Expansion and Contraction of Retail Trading in the Area.**

In Section ii we have shown the increase in the number of persons employed in retail selling. The explanation of this fact may be found in the following considerations:—

(1) Buying does not stop. Even in a depressed area every family has some income to spend. Quantities bought are reduced, the cheapest goods are sought, an increased amount of time and energy is used in shopping; but these changes do not lessen the number of assistants required. The work of weighing and measuring, advising and persuading may even be greater than when buying is less restricted. This applies most to the food and grocery trades, next to them it applies to drapery, boots and clothing. Some goods cease to be demanded. But there is a large range of goods which constitute the ordinary expenditure, and continue to be bought, in poorer quality and in smaller quantities at a time.

(2) The services rendered to consumers tend to increase. Local retailers emphasize such points as the expectation that goods will be delivered, and at frequent intervals, the impatience of customers, who go elsewhere if they do not receive immediate attention, the ever growing variety of goods, which makes selection slower and necessitates explanation and discussion, the habit of buying often in small quantities, instead of laying in supplies at regular intervals, which is said to have been adopted even by the more prosperous customers, the provision of rest rooms, information bureaux, and of various facilities for which no charge is made. Whatever saving in costs may be necessary, the irreducible item is courteous service.

(3) An increasing amount of effort is expended on making shops attractive, so that the customer may be induced to remain as long as possible, and therefore all details are important. Assistants are occupied in displaying goods in original and striking designs. All this does not lead to economy of labour.

(4) When a shop is unsuccessful and either loses its trade to a more enterprising rival or is taken over by it, the result is likely to be an increase in numbers employed. Examples of this can be found in the Area. Under more enterprising management the services and amenities offered to customers increase, sales increase, the number of employees increases.

(5) A minor point is worth noting. A reduction of buying power may lead consumers to do work for which they previously employed others. This increases their retail purchases of, e.g. wood, paint, materials for sewing and cooking etc.

There are many reasons for the increase in the number employed. But the main point is that everything purchased must be actually placed in the hands or in the home of the purchaser. This is the final stage of the productive process, and the numbers required at this stage, while affected by methods which economise labour, can never be greatly reduced. With every increase of buying power, with every fall in retail prices, with a growing complexity both of consumers' wants and of the products which are manufactured more and more persons must be required for the work of selling goods.

The most common reasons for contraction, i.e., for closing of shops or reduction of staff, appear to be the following :—

(1) Loss of custom. This is seen in the colliery districts. Where the chief trade is depressed, and a large percentage of the inhabitants are out of work, the total purchasing power is so much reduced that the demand for retailers' services must fall. In bad times the profit must be made on a larger turnover and distributive costs must be kept as low as possible. Only the firms which can succeed in doing this are able to expand, and they achieve their object by getting custom away from the other firms.

The only way of estimating the number of businesses that fail is by ascertaining the particulars of bankruptcy. (See Table 4.) The figures show that there has been a disproportionate number of bankruptcies in retail trades in the North East Area.

(2) Amalgamation of businesses. Some small co-operative societies have been absorbed in larger societies. Some private firms have been taken over by expanding firms.

(3) Branch shops closed. In some cases branches have been found to be doing too little trade, and have therefore been closed.

(4) Burden of rates. This was mentioned in some cases as a cause of contraction ; but we have no conclusive evidence on this point.

(5) Transfer of population to other districts. There is little evidence of this.

(6) Labour saving methods. In large shops the labour is reabsorbed. In very small shops the methods are not widely adopted. There must be some displacement of labour from this cause, but the point does not appear to have much importance.

The occurrence of contraction does not in any way oppose our main contention : that in retail business reduction of costs is not normally brought about by reduction in the number of employees. Even in depressed districts the number employed increases. Costs are reduced by more skilful buying, wider advertising, devices of all sorts which succeed in attracting custom and making expansion possible. In times of bad trade the expansion of businesses is less than it would otherwise have been, but it continues. The larger and stronger organizations get the trade.

In general, particular examples of contraction and expansion illustrate the point that the main influences are to be sought in changes either in distribution of population or in the organisation or scale of doing business.

At Whitley Bay, a seaside resort, the building of new houses has been followed by the opening of several shops. Here there is also an annual contraction and expansion, as the shops along the sea front are closed at the end of the season.

At Heaton, housing developments have increased the population. The condition of occupation is that tenants should have a family. As the rents are high, many houses are occupied by families of wage-earning age; and this new consumers' demand is reflected in a growth of retail trading.

Walker is becoming a dormitory district for Newcastle. The new housing estate has brought new shops and a marked advance in co-operative activity. The Co-operative Society nearly doubled its staff between 1925 and 1930.

Newcastle itself shows a steady increase. Though its working population lives, to an increasing extent, outside its borders, it is a centre for all Tyneside, and probably gains more from the new transport facilities than it loses from housing extension.

Expansion in one place or in one kind of business will arise from, or be accompanied by, contraction elsewhere. When a new firm or a growing firm extends its premises, takes over unsuccessful firms, draws custom from outlying districts, the number of employees increases. Part of this apparent increase is transference of labour and part is caused by the provision of new services or attractions for consumers. Some persons familiar with the conditions of retail trading expressed the opinion that transference of employees or the changing of traders into employees is the real cause of the increase of numbers. They argue that a certain number of persons are required to sell goods to the rest, and that these persons will be found in such businesses as can thrive under the existing conditions.

Some examples are given of firms that show changes in number employed :—

(1) Department Store.—The company has six stores in different towns. One manager stated that he had not dismissed any employee for reasons connected with trade depression. During the last few years this firm has steadily increased its trade. It offers a wide range of goods of varying quality. It employs dress-makers on its premises, and makes some furniture. It has cafés in the stores. Numbers in the six stores.

1925	1926	1927	1928	1929	1930	1931
1182	1303	1515	1822	2273	2419	2528

This firm has advanced by taking over a business, improving and enlarging the premises, and quickly expanding its trade. Its policy appears to be making a small profit on a large and increasing turnover. In each case it employs a much larger number of persons than the firm it displaced.

(2) Department Store.—An old-established family business. This firm does not seem to have suffered from trade depression. It has a small branch in North Shields. It is still expanding its Newcastle business. Number employed in Newcastle.

1925	1926	1927	1928	1929	1930	1931
428	617	641	664	713	704	746

It has recently opened a café and a department for provisions.

(3) A 3d. and 6d. Store.—This well known multiple business has shown a striking development. It appears to succeed in places where trade is bad, and has opened several new branches. In 1925 there were 6 stores, employing 260 persons. In 1931 there are 17, employing at least 809 persons.

(4) Tea business.—This firm has developed a new business in retail tea dealing. They buy in London, do their own blending, and sell the tea from light vans which go round the district, calling at houses. The number employed has increased from 135 in 1925 to 406 in 1931.

Grocery trading does not show these rapid developments.

(5) A multiple grocery business.—Figures for 7 branches:—

1925	1926	1927	1928	1929	1930	1931
214	197	196	212	205	207	214

Owing to the increased use of branded goods and packet goods in grocery, an economy of labour is possible which is not practicable in the drapery trade. A further point is that if assistants work long hours preparation can be made for the sales of the next day. It seems likely that legal limitation of hours would increase the number employed to a greater extent in grocery than in drapery; but no conclusive evidence is available.

(6) A large private grocery business.—This firm has a large business in Middlesbrough, and a much smaller one in Darlington. The number employed rose from 334 in 1925 to 370 in 1931.

There are indications that the fall in numbers employed occurs chiefly in the smaller firms. A list of firms started and closed given by the Ministry of Labour mentions 6 drapery businesses which went into liquidation or closed for want of trade. The total number of persons employed by them was 280. Three others, employing 318 persons, were all taken over by the same large firm, which expanded the three businesses, until they now employ 957 persons. In the absence of information with regard to firms employing less than 20 persons, it is not possible to state definite conclusions. Among the new businesses started since 1925 are 2 motor salesmen employing 122 and 36 persons, two branches of a London ice cream business, drapers, grocers and tailors, and a few new wholesale firms. Many of the new businesses employ between 20 and 50 persons. The largest are drapers.

In this connection the great growth of motor services in this Area is worth noting. Shops can deliver goods at much greater distances, and customers can come a long way to buy. This must enlarge the field of competition between shops and influence the expansion and contraction of businesses. Situation is less important than it used to be. Blyth, for example, has long been a shopping centre for its district. There are now motor omnibuses going in all directions. It is easier now to come from the villages to buy in Blyth, and it is also easier to go from Blyth to buy in Newcastle. This district has suffered much from depression. In 1930 out of a total of 9,600 persons insured in all trades the sub-area of Blyth had 2,848 unemployed. Of the 1,080 insured in Distributive Trades, only 120 were unemployed. This distributive activity, whether or not it was affected by the greater accessibility of Newcastle, must surely have been maintained at the expense of traders in the surrounding villages.

(v) Conclusions.

The experience of the War established two new facts, that orders could be carried out on a larger scale than had ever been known before, and that women could be substituted for men to an extent not previously realised. The resulting developments can be seen in the distributive trades. The scale of business has become larger, and women are increasingly employed. Standardization of goods is another modern characteristic. It is seen in the large sales of branded goods of all sorts. It does not exclude variety. The boot and shoe trade is an excellent example of both; for while sizes and fittings are available for all customers, the number of styles and colours in footwear for women is continually increasing.

The demand of consumers for goods is indirectly a demand for the kind of organization which can best supply their wants under existing conditions. The displacement of the small retailer, except in certain kinds of trading, is in effect the cessation of a demand for a particular sort of ability. Whether in the future that demand may be renewed in another form will depend on the general development of retail trading. There is a tendency to cut down distributive costs by a mechanization of the work of selling, which is seen most clearly in the multiple shops. There is also a striking development of education. Courses in Advertising and Salesmanship include the study of English and elementary psychology. Drapers' assistants take classes in the manufacture of fabrics, their colour, design and suitability for various uses. Large numbers of shop girls learn elocution. The stationery trade has similar schemes. The Co-operative Union has its own classes. All such education was described by a teacher as aiming at "making retail trading a profession." In this Area the educational movement is still in its early stages. If it develops as its promoters hope, it may improve the economic status of shop workers and the stability of their employment.

The working out of these opposed tendencies will be closely connected with forms of organization. If the function of a shop is to satisfy individual wants and show the consumer how to make the most of his income, the assistant cannot know too much. If the shop exists to sell only certain products in which a controlling organisation is interested, even the manager need know hardly anything. Where the service rendered to the consumer is greater, the number of persons employed will be greater.

In so far as the consumers' chief need is to buy cheaply, the more mechanical methods of trading are demanded. But if shops are controlled by powerful financial groups, the consumer does not easily discover whether he is receiving the benefit of mass production and mass distribution, or is paying for the monopoly element.

The co-operative societies show every indication that they will continue to develop. With their present staffs, they could do a great deal more business than they are doing now; consequently, no rapid increase of employment is to be expected.

The department stores which have been expanding recently seem likely to expand further. As we have already shown, the difficulty is to estimate how far their growth really brings a substantial increase in total numbers employed.

On the whole, we think that the demand for labour in the distributive trades has increased in the past and will continue to increase, but at a rather slower rate. Selling by automatic machines is already developing, and any such development must act as a check. Other new devices leading to economy of labour are likely to be invented. The advance in providing new services for customers has been so rapid in recent years that a slower advance may reasonably be expected in the immediate future. We cannot fix the percentage either of total population or of numbers in all trades which is normally employed in the distributive trades. But if we can accept the figures of the Ministry of Labour as sufficiently indicating the position of employment in these trades, some inference may be drawn from them.

The figures in Table 1 show that the number employed has increased between 1927 and 1931. After 1927 this increase slows down. We think that the number required in five years from now will not be more than about 80,000.

To this extent it is to be expected that these trades will continue to absorb a further proportion of the working population. The number of women will probably show some increase in proportion to the number of men employed. The unemployment percentage, though lower than for trades in general, is high, considering how constant is the demand for labour in these trades. It is to be hoped that it will fall. Possibly some of the changes in the number of insured persons are due to changes in the administration of the Unemployment Insurance Acts, the effects of which we are not able to trace.

Finally, we would point out that this Area depends mainly on industries of the heavy or basic type and that only a small part of its working population is employed in the production of consumption goods. With the exception of some manufacture of furniture, confectionery, clothing and a few other products, the goods which retailers are engaged in distributing come from outside the Area. Thus, in any period of depression in the chief industries, there is not a sufficient background of production of consumption goods, for which demand is relatively stable. This is an economic disadvantage which cannot be compensated by any increase of activity in the distributive trades.

TABLE 1.—*Increase in Persons Employed in Distributive Trades.*
North East Coast Area.

Year.	Men.	Boys.	Women.	Girls.	Total.
1923	23,500	3,809	23,645	5,474	56,428
1924	25,393	5,275	25,878	5,560	62,106
1927	30,207	5,684	28,293	6,082	70,266
1929	31,522	5,406	29,292	6,906	73,126
1930	31,370	5,466	29,532	6,925	73,293
1931	31,706	5,812	30,947	7,206	75,671

TABLE 2.—*Relation between all Trades and Distributive Trades.*
In Unemployment Percentages.

Year.	Great Britain and Northern Ireland.		North East Coast Area.	
	All Trades.	Distributive Trades.	All Trades.	Distributive Trades.
1923	11.3	5.9	16.1	6.8
1924	9.3	6.2	12.8	7.3
1927	8.8	4.7	18.4	8.3
1929	9.6	5.5	14.5	9.1
1930	15.4	8.1	21.7	12.3

Highest 1930 figure for whole country was 10.4 on November 24th.

The Unemployment percentage is higher in North East Coast Area.

The Unemployment in the Distributive Trades is less in both areas than for all trades, but higher in North East Coast Area than for whole country.

TABLE 3.—*Numbers employed in Co-operative Societies in North East Coast Area.*

The figures supplied by the Ministry of Labour show an increase in the number employed in districts where the depression is less acute, or population has grown.

	1925.	1931.
Darlington	300	530
Wallsend	200	261
Chester-le-Street	200	320
Blyth	168	250
North Shields	90	120
Newcastle	1,223	1,377
Other Societies show a marked decrease in numbers.		
Stanley Exchange (6 Societies)	553	446
Sunderland	322	153
South Shields	88	65

These are depressed districts.

Many of the Societies show very little change.

There are discrepancies between the Ministry of Labour figures and those published by the Co-operative Union, the latter being larger. The Ministry of Labour figures would not include juvenile employees.

TABLE 4.—*Bankruptcies in Six Retail Trades in the North East Coast Area. The figures are for the County Courts of Durham, Middlesbrough, Newcastle, Northallerton, Stockton and Sunderland.*

	1925.		1926.		1927.		1928.		1929.	
	England and Wales.	Area.	England and Wales.	Area.	England and Wales.	Area.	England and Wales.	Area.	England and Wales.	Area.
Bakers ...	142	10	142	4	119	8	100	3	112	7
Butchers ...	134	6	106	6	96	5	125	11	147	8
Confectioners ...	136	8	125	10	142	11	142	16	140	12
Drapers ...	176	18	188	12	205	25	229	20	238	15
Greengrocers ...	150	17	145	7	147	22	167	11	131	5
Grocers ...	362	30	289	16	337	14	367	25	371	17

For all trades taken together, the bankruptcies in the Area were in 1927 less than 3 per cent. of bankruptcies in England and Wales, in 1928 the percentage was 2.7 and in 1929 it was about 2. For the six retail trades the proportion is much higher.

Year.	All Trades.		Six Retail Trades.	
	England and Wales.	Area.	England and Wales.	Area.
1925 ...	6,585	—	1,100	89
1926 ...	6,002	—	995	55
1927 ...	6,170	176	1,046	85
1928 ...	6,221	170	1,130	86
1929 ...	6,990	119	1,139	64

In England and Wales the bankruptcies in the six trades are roughly one sixth of the total, in this Area they are about one half.

XV.—LABOUR IN THE NORTH EAST COAST AREA.

(Memorandum by Mr. H. E. R. Highton.)

(i) Changes in the Occupational and Industrial Distribution of the Population.

Introductory—Changes in the Total Population.

1. The Survey Area includes the Counties of Northumberland and Durham and the Cleveland District of North Yorkshire. It contains 3,000 square miles of land, or one-eighteenth of the area of England and Wales. The Preliminary Report of the Census of

1931 states the population of the Area to be 2,495,559 persons, or one-sixteenth of the population of England and Wales. The average density is, therefore, 830 persons per square mile compared with 690 for England and Wales.

2. The following table shows the changes in the population of England and Wales and on the North East Coast, and in the proportion of the total living in the Area at each census since 1901.

TABLE 1.—*Changes in the Population in Great Britain and on the North East Coast.*

	1901.		1911.		1921.		1931.	
	Nos.	Index.	Nos.	Index.	Nos.	Index.	Nos.	Index.
Population of England and Wales.	32,528,000	100·0	36,070,000	110·9	37,887,000	116·4	39,948,000	122·8
Population of N.E. Coast Area.	1,974,600	100·0	2,287,000	115·9	2,470,000	125·1	2,496,000	126·4
Proportion per 10,000 on N.E. Coast.	610	100·0	635	104·1	650	106·5	625	98·3

The table shows that prior to the War the proportion of the population of the country living on the North East Coast was increasing: at the Census of 1901 it was 6.1 per cent.; in 1911, 6.3 per cent. In the intercensal period 1911-1921, covering the War, this tendency continued and at the end of it the proportion was 6.5 per cent. But in the post-war decade the population in the Area declined relatively to that of England and Wales and in 1931 had fallen to 6.25 per cent., slightly below the pre-war level, though still higher than at the end of the XIX century.

1.—*Changes in the Industrial Population.*

3. *Position of the North East Coast in 1921.*—It is not possible to make the same comparison of the changes in the numbers of the population engaged in gainful occupations. In the Occupation Tables of the Reports on the Censuses of 1901-11-21 the Cleveland District cannot be distinguished from the rest of the North Riding, and those for 1931 are not yet published. The Report on the Census of England and Wales, 1921, included Industry Tables giving for the various industries the numbers of persons of all occupations attached to each of them. Table 2 of this part of the Report gives these statistics for the North East Coast, which is defined as including the southern part of Northumberland, the whole of County Durham and the Cleveland District of the North Riding of Yorkshire. This table shows that the number of persons engaged in industry in this Area, which excludes the greater part

of rural Northumberland, was 5.2 per cent. of the total for England and Wales, while 6.35 per cent. of the total population lived in it: so that, although the population density of the Area is higher than the average for the country, the proportion engaged in industry is lower. It will be shown below (Par. 6) that this difference is accounted for by the relatively small number of women and girls engaged in industry in the Area.

4. *Data for Changes 1923-1931.*—For the period following 1921 the statistics of the Ministry of Labour relating to the numbers of persons insured against unemployment in the industries covered by the Unemployment Insurance Acts form the chief data upon which estimates of the changes in industrial distribution can be based. Prior to 1921 only a small proportion of the total persons engaged in industries in Great Britain came under the Unemployment Insurance Acts—in 1919-1920 about 24 per cent. From 1921 onwards 65-70 per cent. of the industrial population have been insured*. The remaining 30 per cent. includes all under 16 years of age, and, since 1928, all over 64 years; all non-manual workers earning over £250 per annum; all persons employed in agricultural occupations and in private domestic service; and certain classes of permanent employees. For Great Britain the number of workers insured in each industry and the number of these unemployed are given in the Ministry of Labour Gazette and in the Abstract of Labour Statistics. For the Survey Area the Ministry of Labour supplied us with the corresponding figures for the beginning of July in each of the years 1923, 1924, 1927, 1929, 1930 and 1931. Unfortunately the figures as given are not comparable for the years before 1928 and after 1927. In the earlier period all workers in the insurable categories aged 16 and upwards are included: but from 1928 all those 65 years of age and over are excluded. In 1927, however, the Ministry made an estimate of the number of insured

* Note.—The Nineteenth Abstract of Labour Statistics, 1928, gives the numbers of employees 12 years of age and over, engaged in industry in Great Britain (page 7) and the estimated numbers of work-people insured under the Unemployment Insurance Acts, 1911-1928 (page 33). The following table gives the relevant figures:—

Number "occupied" in Great Britain, aged 12 years and over, Census, 1921.	Insured 1919-1920.		Insured at July, 1921.	
	Number.	Percentage of Occupied.	Number.	Percentage of Occupied.
Males ... 12,163,000	—	—	7,974,290	65.6
Females ... 5,252,000	—	—	3,106,640	59.0
Total ... 17,415,000	4,197,018	24.0	11,080,950	63.7

The 1931 Census showed that the total population of Great Britain (all persons) had increased by about 5 per cent. from 1921. The insured population increased in the same period by 10.0 per cent. It seems a fair inference that the proportion of the total "occupied" population insured against unemployment had increased to something like 70 per cent.

persons aged 16-64 in each industry, so that for that year the proportion of those in that age-group could be calculated. Assuming the same age distribution for 1923 and 1924 as these figures disclosed, and further assuming the same age distribution on the North East Coast as for the country as a whole, comparable figures for all the years given were arrived at. As no estimate can be made of the number who, after 1927, left insurable occupations owing to the operation of the Old Age, Widows', and Orphans' Pensions Act, the statistics for 1923, 1924 and 1927 were reduced to the estimated numbers in the age-group 16-64 and Tables I and II Appended (pp. 493-500) compiled. In view of the assumptions made, no exact accuracy can be claimed for the figures so arrived at; but the margin of error is not likely to be material, and we believe that conclusions drawn from them are sufficiently valid. Separate statistics are given in the tables for all industries and services which in 1931 contained 1 per cent. or more of the insured workers in the Area. Index numbers have been used to indicate the movement in each case—1924 being taken as 100. Throughout the memorandum the figures relating to insured workers are obtained from these tables.

5. *Aggregate numbers of Insured Persons.*—The decline in the relative importance of the North East Coast in the period 1921-1931 indicated by the population figures (Par. 2) is found also in the movement in the number insured against unemployment shown in the following table :—

TABLE 2.—*Changes in the Numbers of Insured Workers in Great Britain and on the North East Coast.*

<i>At July in</i>	<i>1923.</i>	<i>1924.</i>	<i>1927.</i>	<i>1929.</i>	<i>1930.</i>	<i>1931.</i>
Number Insured in Great Britain.	10,903,000	11,061,000	11,526,000	11,834,000	12,138,000	12,500,000
Number Insured on North East Coast.	681,120	682,000	682,820	689,630	701,300	712,090
Proportion of Insured in North East per 10,000.	625	618	592	583	577	570

The table shows a steady decline in the proportion of insured workers in the Area to those in Great Britain from 6.25 per cent. in 1923 to 5.7 per cent. in 1931.

6. *Increase of Women in Industry.*—Apart from commerce, retail dealing and domestic service, which commonly employ large numbers of women, there is no considerable women's industry in the Area. The largest single industry, coal mining, is not only a men's industry in itself, but its characteristic dispersion in villages and small townships of the single-industry type, with little local demand for clerks, shopkeepers and domestic servants, accounts largely for the fact that the proportion of women and girls engaged in industry is markedly lower than in the country generally. At the Census of 1921, the proportion of occupied females to the total occupied population in England and Wales was 2,948 per 10,000 or about 30

per cent., while for the North East Coast industrial area it was only 1,896 or about 19 per cent. But in this respect also the position is changing. The Unemployment Insurance statistics for the Survey Area supplied by the Ministry of Labour, which, however, exclude agriculture and private domestic service, show that the number of women and girls engaged in industry is not only growing relatively to that of men and boys in the Area, but also to that of women and girls so engaged in Great Britain. The following table shows the changes since 1923 :—

TABLE 3.—Changes in the Proportions of Insured Women to Total Insured Persons in Great Britain and on the North East Coast.

Year at July	Proportion of Insured Women and Girls in Great Britain per 10,000 Insured Persons.	Index Number 1924 = 100.	Proportion of Insured Women and Girls on the North East Coast per 10,000 Insured Persons.	Index Number 1924 = 100.
1923 ...	2,602	99·0	1,096	96·0
1924 ...	2,612	100·0	1,139	100·0
1927 ...	2,658	102·0	1,201	105·5
1929 ...	2,735	104·5	1,283	112·5
1930 ...	2,775	106·0	1,329	116·5
1931 ...	2,783	106·5	1,388	122·0

It will be seen that while since 1923 there has been a growth of 6.5 per cent. in the proportion of women and girls engaged in the insured occupations in Great Britain, the increase on the North East Coast has been 26.5 per cent.; although the proportion was still only half that for the whole country.

7. Summarizing the results of the analyses in Paragraphs 1-6, the post-war decline in the relative numbers of the population and of insured workers with the progressive increase in the proportion of women and girls in industry show that, so far as the number of persons engaged in and maintained by industry is a measure of economic importance, the North East Coast has, since 1921, slowly but steadily lost ground relatively to the rest of Great Britain.

2.—Changes within the Area.

8. *The Industrial Character of the Area.*—The economic organization of the North East Coast is based on the great coalfields of Durham and Northumberland and the iron ore of Cleveland. The Rivers Tyne, Wear and Tees provide waterways and sites for shipbuilding yards, docks and harbours. This combination has made the Area one of the most important industrial centres in Great Britain, in which coal and iron mining, the manufacture of iron and steel, shipbuilding, engineering, and shipping, are carried on on a large scale and maintain a large working population. Containing about one-seventeenth of the total population of

Great Britain, the North East Coast includes nearly one-fifth of the workers engaged in the mining and treatment of coal in the whole country; well over one-sixth of those mining iron ore and manufacturing iron and steel; well over one-fourth of those building and repairing ships; about one-twelfth in engineering; the same proportion in shipping and waterside services; and nearly one-eighth of the workers in chemicals. Considerably over one-half of the total workers in the Area belong to these industries. These are not only the basic industries of modern production, but are the industries upon which, apart from textiles, the economic position of Great Britain in the world depends. It is therefore obvious that the fortunes of the North East Coast are bound up with the state of world trade, subject to the cyclical fluctuations characteristic of the production of capital goods and, more immediately, to the conditions of the export trade of the country.

9. *Value of Insurance Statistics.*—The periodic changes in the number of insured persons in each industry, we believe, give some indication of relatively permanent tendencies in their movement. Speaking generally, they are not immediately sensitive to short run variations in employment. In fact, especially in the more skilled trades, they tend to lag in following definite changes of direction. The reasons for this will be discussed later when the problem of mobility is investigated, but while this lag must qualify any conclusions drawn from the statistical evidence, we think it is not sufficient to invalidate the generalization that changes in the distribution of the insured workers give valuable evidence of changes in the relative importance of the Survey Area in the country as a whole and of the principal industries within the Area. Further, apart from the decennial Census returns, the Unemployment Insurance figures are the most complete statistical evidence available for almost all of the industries.

10. As 1924 is a minor peak in the curve of employment in the Survey Area, indicating the relative local recovery from the slump of 1920-21, that year is taken as the starting-point of the movement among insured workers. The troubles of 1926 were followed by a national recovery which in 1929 was brought to an end by the effects of the world depression which are clearly shown in the catastrophic fall in the numbers employed at July, 1931—the latest available for the Area (see Table II in the Appendix). It is important to distinguish the effects on the Area of national and world influences, and in the analyses which follow attention is drawn to the quantitative results on the industries of the North East Coast in the periods 1924-1929 and 1929-1931 respectively. In the small tables used in the text the numbers of insured persons are given for 1924 and 1931 to indicate the numerical proportions of the various industry groups at the beginning and end of the period, and index numbers for 1927, 1929, 1930 and 1931 based on 1924 = 100, to show the movement during the period.

11. *Changes in Aggregate Numbers of Insured Persons.*—The total insured population of the North East Coast at July, 1924, was 682,000, which was 6.2 per cent. of the total for Great Britain. In 1931 the corresponding figures were 712,090 and 5.7 per cent. The following table shows the changes during the period :—

TABLE 4.—*Changes in the Numbers of Insured Workers in Great Britain and on the North East Coast.*

	Numbers Insured.		Index : 1924 = 100.			
	1924.	1931.	1927.	1929.	1930.	1931.
	000's.	000's.				
Great Britain ...	11,061	12,500	104·0	107·0	110·0	113·0
North East Coast ...	682	712	100·0	101·0	103·0	104·4
Proportion in North East.	6·2 per cent.	5·7 per cent.	96·0	94·3	93·3	92·2

The table shows that while from 1924, in both Great Britain and on the North East Coast, the growth of the insured population was steady, it was much slower in the Survey Area ; with the result that the latter steadily lost ground in the country. The cumulative increase in the North East was 30,000 and the following table shows the changes in the principal industries during the period :—

TABLE 5.—*Changes in the Numbers of Insured Workers in the Principal Industries on the North East Coast.*

Industry Group.	Numbers Insured.		Index : 1924 = 100.			
	1924.	1931.	1927.	1929.	1930.	1931.
1. Coal and Coke	239,000	205,200	94·0	89·0	88·5	86·0
2. Iron and Steel...	46,000	35,600	91·5	86·0	84·5	77·5
3. Engineering ...	63,900	59,600	95·0	94·5	97·5	93·0
4. Shipbuilding ...	59,600	51,100	87·0	91·0	92·0	86·0
5. Chemicals ...	5,700	11,800	139·0	291·0	282·0	208·0
6. Shipping and Waterside	23,200	28,700	112·0	121·0	116·0	124·0
7. Building and Contracting	32,200	52,800	124·0	114·0	118·5	164·5
8. Woodwork, Furniture, etc.	5,500	7,400	114·0	121·5	128·5	134·5
9. Printing and Paper	7,600	9,500	99·0	118·5	130·5	125·0
10. Food, Drink, and Tobacco	13,000	15,100	113·0	114·5	114·0	116·5
11. Distributive Trades	65,800	89,700	114·0	122·5	127·0	136·5
12. Hotel, Boarding House, Club, etc. Service	10,800	16,400	125·0	125·0	140·5	152·0
13. Road Transport	10,500	18,300	124·0	151·0	161·0	173·5
14. All Others ...	99,200	111,100	103·5	102·0	107·5	112·0

12. *The Basic Industries.*—In view of the relative importance in the Area of the basic industries—Coal, Iron and Steel, Engineering, Shipbuilding, Chemicals, and Shipping*—the closer analysis of the changes in distribution of the insured population is divided into two parts, the first dealing with the foregoing group. The following table shows the movement of this group as a whole over the period :—

TABLE 6.—*Changes in the Numbers of Insured Workers in the Basic Industries—Great Britain and the North East Coast.*

	Numbers Insured.		Index : 1924 = 100.			
	1924.	1931.	1927.	1929.	1930.	1931.
Great Britain ...	2,868,630	2,610,460	95·0	92·0	92·0	91·0
North East Coast ...	437,460	392,140	94·0	94·0	94·0	90·0
Proportion on North East Coast	15·2 per cent.	15·0 per cent.	99·5	101·5	101·5	98·5
Proportion of all North East Insured	64·0 per cent.	55·0 per cent.	94·0	93·0	91·0	86·0

It will be seen that in these industries which, as a group, averaged over the period included about three-fifths of the total insured population of the Area, the aggregate numbers fell from 437,460 in 1924 to 392,140 in 1931; a loss of 45,520 or 10·0 per cent. The drop in Great Britain in this group was 9·0 per cent. While the decline in the country was steady over the whole period, more than half the aggregate loss in the North East is shown in 1927. The decrease was then 25,860, the cumulative decrease for the next three years being only 1,350, followed in 1930-31 by a steep fall of 18,310. Reference to Table 5 in Par. 11 will show that the cause of this irregularity was the change in the chemical industry. The establishment at Billingham of the Imperial Chemical Industries' works added over 10,000 (or 200 per cent.) to the workers insured in that industry in 1927. Apart from this influence the basic industries as a group would have followed much the same course on the North East Coast as in the country as a whole from 1924 to 1929. The chemical industry suffered a relatively heavy loss in the world slump of 1930-31. At the end of the full period the number of insured persons in these six industries had moved with the aggregate of the whole country—in 1924 the proportion in the Area was 15·2 per cent.; in 1931 15·0 per cent.

* Shipping has been included in the Basic Industries owing to its relative importance on the North East Coast in relation to the economic characteristics of the Area.

13. But inside the group there was considerable variation in the movement, as will be observed in the table given at the end of par. 11. The distribution of the changes inside the Area is further brought out by the actual increase or decrease from 1924 at July, 1929 and 1931, respectively in each industry.

TABLE 7.—Changes in the Numbers of Insured Workers in the Basic Industries from 1924.

Industry.	Increase (+) or Decrease (—) In North East.		Percentage Change on North East.		Percentage Change in Great Britain.	
	1929.	1931.	1929.	1931.	1929.	1931.
1. Coal and Coke	— 26,900	— 35,850	— 11·0	— 14·0	— 12·0	— 14·5
2. Iron and Steel	— 6,400	— 10,200	— 14·0	— 22·5	— 11·5	— 17·5
3. Engineering ...	— 3,300	— 4,350	— 5·5	— 7·0	— 0·5	— 1·0
4. Shipbuilding ...	— 5,200	— 8,500	— 9·0	— 14·0	— 20·0	— 24·0
5. Chemicals ...	+ 10,800	+ 6,100	+ 191·0	+ 108·0	+ 11·0	+ 4·0
6. Shipping ...	+ 4,900	+ 5,500	+ 21·0	+ 24·0	+ 1·0	+ 8·0
Industries 1-6	— 26,100	— 45,300	— 6·0	— 10·0	— 8·0	— 9·0

The relative movement of each industry in the Area and in the country as a whole is shown in the following table:—

TABLE 8.—Relative Movement of Numbers of Insured Workers in the Basic Industries in Great Britain and on the North East Coast.

Industry.	Percentage on North East of Insured in the Industry in Great Britain.		Index: 1924 = 100.			
	1924.	1931.	1927.	1929.	1930.	1931.
1. Coal and Coke ...	19·3	19·4	98·0	101·0	101·0	100·0
2. Iron and Steel ...	19·0	17·7	99·0	97·5	95·0	93·5
3. Engineering ...	8·5	8·6	98·0	95·5	96·5	94·0
4. Shipbuilding ...	24·7	27·8	107·5	114·5	115·2	113·0
5. Chemicals ...	6·0	12·6	143·0	261·5	259·5	200·0
6. Shipping ...	7·7	8·8	111·0	120·0	114·5	114·5
Industries 1-6	15·2	15·0	99·5	101·5	101·5	98·5

To complete the picture the following table gives in the same form the movement of each industry in relation to the total insured population of the Area:—

TABLE 9.—*Relative Movement of Numbers of Insured Workers in the Basic Industries and in all Industries on the North East Coast.*

Industry.	Percentage of Total Insured in North East.		Index : 1924 = 100.			
	1924.	1931.	1927.	1929.	1930.	1931.
1. Coal and Coke ...	35.0	29.0	93.0	88.0	86.0	84.0
2. Iron and Steel ...	6.8	5.0	91.0	85.0	82.0	74.0
3. Engineering ...	9.4	8.4	95.0	94.0	95.0	89.0
4. Shipbuilding ...	8.7	7.2	87.0	90.0	89.5	82.0
5. Chemicals ...	0.8	1.7	139.0	289.0	268.0	199.5
6. Shipping ...	3.4	4.0	111.5	119.5	112.5	118.5
Industries 1-6 ...	64.0	55.0	94.0	93.0	91.0	86.0

A study of these tables shows that rather more than the net aggregate loss of insured workers in the basic industries from 1924 to 1929 is accounted for by *Coal and Coke*, by far the largest industrial unit in the North East. The world slump affected this unit relatively less than the rest and it contributed little more than a third to the aggregate loss of 1929-31. A remarkable feature of the movement in this industry is that it has held its own with the industry in the country over the period as a whole. The *Iron Ore Mining and Iron and Steel Manufacturing* group lost heavily both in the Area and in the country as a whole. By 1929 it had dropped 14.0 per cent. as against a fall of 11.5 per cent. in Great Britain. In the 1929-31 depression it fared even worse. By July, 1931, it had shed 22.0 per cent. of its 1924 total and its share of the total for Britain had fallen from 6.8 per cent. to 5.0 per cent. The *Engineering* group also lost ground in both relations but comparatively much less. Owing to the specialized skill of the workers in this industry, the effects of the ups and downs in prosperity do not show themselves readily on the numbers of insured workers, as they cannot easily transfer to other kinds of work. Even in the heavy fall in employment during 1930-1 the numbers insured in the Area were, at July, 1931, 93.0 per cent. of the 1924 total, as against 94.5 in 1929. *Shipbuilding and Ship-Repairing* gained considerably relatively to the country as a whole, for, while by 1929 the total insured in the Area was 9.0 per cent. less than in 1924, in the whole country the loss was 20.0 per cent. The gap was narrowed by 1931, the respective figures being 14.0 per cent. and 24.0 per cent. *Chemicals*, as has already been pointed out, is a special case (see Par. 12). Of its phenomenal increase of 200 per cent. by 1929, it lost about half during 1930-31. The *Shipping and Waterside Services* group is the one bright spot in this depressing picture of the North East's characteristic industries. By 1929 the number of insured workers had steadily but rapidly increased by 21.0 per cent. while the number in the country as a whole had slowly grown by 1.0 per cent. After a slight setback in 1930, the total in the Area again increased in 1931 to 24.0

per cent. above the 1924 level, the figures for Great Britain also showing a jump to 8.0 per cent. The Area's share of the insured workers in these services in the country was 7.7 per cent. in 1924, 9.2 per cent. in 1929 and 8.8 per cent. in 1931. The great importance of these six industries to the North East Coast has already been emphasised and the fact that the heaviest decreases in the numbers of insured workers are found in units within the group—Coal, Iron and Steel and Shipbuilding—for which the Area is most favourably placed, must be noted. The seriousness of this position is reinforced by the change in their relation to the total insured population in the Area. In 1924 these three groups had over 50.0 per cent. of the insured workers on the North East Coast attached to them; in 1929 their share had dropped to under 47.0 per cent.; and by 1931 to just over 41.0 per cent.

14. *Other Principal Industries.*—The aggregate increase in the number of insured workers in the industries and services other than the basic industries (Nos. 7-14 inclusive, Tables I and II App.), was from 244,540 in 1924 to 278,290 in 1929, an increase of 33,750, or 14 per cent. In the next two years this movement was greatly accelerated and in 1931 the number was 320,150, an addition of 75,610 since 1924, or 31 per cent. Over the whole period the changes both in the country generally and in the Area were remarkably steady as will be observed by the table:—

TABLE 10.—*Changes in the Numbers of Insured Workers in all Industries and Services, other than the Basic Industries, on the North East Coast.*

	Numbers Insured.		Index: 1924 = 100.			
	1924.	1931.	1927.	1929.	1930.	1931.
Great Britain ...	8,192,170	9,889,540	107.5	112.0	116.0	121.0
North East Coast ...	244,540	320,150	111.0	114.0	119.0	131.0
Proportion in North East	3.0 per cent.	3.2 per cent.	103.0	102.0	105.0	108.5
Proportion of all North East Insured	36.0 per cent.	45.0 per cent.	111.0	113.0	116.0	125.5

The acceleration in the movement and its relatively higher rate on the North East Coast is due to the position of the basic industries. From 1927 to 1930 these industries were practically stationary in both the country and the Survey Area. The increase in the insured population in the country as a whole was an accelerating one and the industries under review absorbed it. In the Area, while the insured population was increasing at a slower rate, the basic industries were so much larger a proportion of the total that their static condition involved a relatively greater increase in the other industries and services. The outstanding fact is that not only did this group contain a considerably higher proportion of the insured population in 1931 than in 1924—45 per cent. as against 36 per cent.—but it increased absolutely by over 30 per cent. in the seven years, while the basic industries suffered an absolute loss of 10.5 per cent.

15. The following tables are on the same lines as those given for the basic industries in Par. 13, but include only the principal

industries, i.e., those with 1.0 per cent. or more of the total insured in the Area :—

TABLE 11.—*Changes in the Numbers of Insured Workers in the Seven Principal Industries, other than Basic Industries, on the North East Coast.*

Industry.	Increase on North East Coast.		Percentage Increase on North East Coast.		Percentage increase in Great Britain.	
	1929.	1931.	1929.	1931.	1929.	1931.
7. Building and Contracting.	+ 4,400	+ 20,600	+ 13·5	+ 64·5	+ 20·5	+ 37·0
8. Woodwork, Furniture, etc.	+ 1,200	+ 1,900	+ 21·5	+ 34·5	+ 15·5	+ 21·5
9. Printing and Paper.	+ 1,400	+ 1,900	+ 18·5	+ 25·0	+ 9·5	+ 16·5
10. Food, Drink and Tobacco.	+ 1,900	+ 2,200	+ 14·5	+ 16·5	+ 2·5	+ 7·0
11. Distributive Trades.	+ 14,700	+ 23,800	+ 22·5	+ 36·5	+ 26·0	+ 40·5
12. Hotel, Boarding House, Club, etc. Service.	+ 2,700	+ 5,600	+ 25·0	+ 52·0	+ 21·5	+ 39·5
13. Road Transport	+ 5,400	+ 7,700	+ 51·0	+ 73·5	+ 28·5	+ 45·0
14. Other Industries and Services.	+ 2,100	+ 11,900	+ 2·0	+ 12·0	+ 4·0	+ 11·5
Industries 7-14 ...	+ 33,800	+ 75,600	+ 14·0	+ 31·0	+ 12·0	+ 21·0

TABLE 12.—*Relative Movement of the Numbers of Insured Workers in the Seven Principal Industries, other than Basic Industries, on the North East Coast and in Great Britain.*

Industry.	Percentage on North East Coast of Insured in the industry in Great Britain.		Index : 1924=100.			
	1924.	1931.	1927.	1929.	1930.	1931.
7. Building and Contracting.	4·0	4·8	104·5	94·5	95·5	120·0
8. Woodwork, Furniture, etc.	3·0	3·3	104·5	105·5	109·5	111·0
9. Printing and Paper.	2·2	2·4	94·5	108·0	114·0	107·5
10. Food, Drink and Tobacco.	2·6	2·9	110·5	111·5	108·5	109·0
11. Distributive Trades.	5·0	4·9	98·0	97·0	96·0	97·0
12. Hotel, Boarding House, Club, etc. Service.	4·0	4·3	101·0	103·0	111·0	108·5
13. Road Transport	4·1	4·9	109·0	117·5	120·0	119·5
14. Other Industries and Services.	2·2	2·2	100·0	98·0	98·5	101·0
Industries 7-14 ...	3·0	3·2	103·0	102·0	105·0	108·5

As the Distributive Trades (12.5 per cent.) and Building and Public Contracting (5.5 per cent.) are the only units in this group of industries with more than 2.5 per cent. of the total insured population on the North East Coast, a table of the movements of the industries in this respect is omitted.

16. It will be noted that the world slump of 1929-31 has not visibly affected the movement in the increase of insured persons in any of these industries and services. The fall in the basic industries has probably resulted in a certain transfer to some of them. In any case nearly all of them show a steady increase at varying rates of acceleration. The principal exception to this is *Building and Public Contracting*. The abnormal increase in this group in 1930-31 was in Public Contracting, and appears to be mainly due to the coming into operation of road and other public work schemes resulting from Government policy—the number of insured workers in this category which had never reached 9,000 in the Area prior to July, 1930, had, in 1931, jumped to 21,000. Building remained at much the same level of round about 30,000 from 1927 on. The *Wood-Working Trades*, the *Printing and Paper Trades*, and *Food, Drink and Tobacco* all show a fairly steady increase taking the period as a whole. The greatest aggregate increase appears in the *Distributive Trades*. In 1931 the total of insured workers in this industry was 90,000—24,000 more than in 1924, an increase of 36.5 per cent. Even so, it did not quite keep pace with the remarkable growth in this group in Great Britain as a whole. *Hotel, Public-house, Restaurant, Boarding-house, Club, etc. Service* show a similar movement, though the increase in the Area has been rather greater than in the country generally. These two categories include the majority of insured women and girls in the Area, and the proportion has been steadily growing at an accelerated pace since 1924. In July of that year it was 51 per cent., in 1931 it was 56 per cent. : the aggregate increase in the services being 13,500 or 36 per cent. *Road Transport* which includes the Tramway Service, shows the greatest growth of all the industries and services in the Area, excepting Chemicals; with most of the group covered in this paragraph, it shows a continuously accelerated increase of insured workers. In 1931 the number was 73.5 per cent. greater than in 1924. This appears to have been to a considerable extent at the expense of the Railway Service. Only a small section of railway workers are insured, but figures for the *full staff employed* on the railways in the Area show a fall of 6,700.

Summary.

17.—(1) It is clear that since 1924 the North East Coast, in respect of the number of insured workers, has been losing ground heavily in the great group of industries based on coal and iron and its waterways. In the mining and treatment of coal, and in the mining of iron ore and manufacture of iron and steel, the loss

appears to have been almost entirely due to the decline in the country generally. In shipbuilding, the North East has lost less ground relatively, while in the shipping and waterside services there has been an actual gain both in the Area and in relation to Great Britain as a whole. The case of chemicals as already noted (see Par. 12) is exceptional. Since these are the industries on which the Area has hitherto been mainly dependent and are those for which its physical characteristics make it most favourably situated in the country, it would seem that hope of a recovery of the Area's economic position is bound up with a revival in the export trade of Great Britain and therefore in world trade generally.

(2) There has been, in common with the rest of the country, a considerable shift of labour to other industries and services, chiefly those providing for the immediate needs of the population. An increase in these taken by itself would be a decided gain. It would indicate a rise in the standard of life of the people; it would provide greater opportunities for women which have been relatively lacking in this Area; and these industries are much less subject to the fluctuations characteristic of the production of "capital goods". But related to the economic position of the Area generally, it is difficult to see any prospect of them making up for any substantial permanent loss in the basic industries. Since they are mainly consumption and domestic industries and services, they must, despite the apparent contradiction of the statistics analysed in this part of the Memorandum, be ultimately dependent on the prosperity of the country in general and of the Area in particular and, unless some great change takes place, the prosperity of both is bound up with the basic industries.

(ii) Changes in the Distribution of Employment.

1. *Introductory.*

18. If the movement of the number of workers insured against unemployment in the various industries is a useful indication of the general trend of the changes taking place in the economic organization of the North East Coast Area over the period under review, the movement in the actual numbers employed is a still more accurate measure of the fluctuations in industrial prosperity during the seven years.

This part of our investigation is, like that of the changes in the distribution of insured workers, based mainly on the statistics supplied by the Ministry of Labour. For Great Britain these give the numbers of insured workers in each industry registered as unemployed at monthly periods in each year. For the Survey Area the figures were specially provided and give the numbers, at the end of June only, in each of the years 1923, 1924, 1927, 1929, 1930 and 1931. Table II appended to this Memorandum is compiled from these and from the published statistics for Great Britain. They have been made comparable as to age-groups by the same method as in the case of Table I described in Par. 4 above. The numbers

of employed have been arrived at by deducting the number of registered unemployed at the end of June from the estimated number of workers insured at July in each year. In addition to the qualifications applicable to the tables generally, stated in Par. 4, two others have to be made regarding the figures relating to employment—(1) While the growth of the numbers insured is on the whole continuously steady during the year and therefore the figures at July in each year are fairly indicative of the changes taking place, the changes in the numbers employed vary considerably from week to week, and the variations differ in each year. The figures supplied to us for the Survey Area give the position at the end of June in each year only, and it has not been possible therefore to allow for any exceptional influence which may have affected the figures at that date in one year as compared with any other. (2) In using the movement of the numbers employed as a measure of the condition of industry in the Area, it must be borne in mind that any alteration in the average productivity per worker occurring during the period will modify the results so arrived at. Over the short period reviewed, however, this is probably not a very material factor and may be safely neglected in the absence of any means of measuring it.

19. For the reasons given in Par. 10 above, 1924 is taken as the starting point of the movement in employment and in the analyses the periods 1924-29 and 1929-31 are distinguished. The tables in the text are also on the same lines as in Part (i).

2. Changes in Employment in the Area.

20. At the end of June, 1924, there were 594,540 insured workers employed in the North East Coast Area. At the same date in 1927 the number was over 6 per cent. less. By 1929 it had risen to 589,300, still 1 per cent. below the 1924 level. This recovery from the national depression of 1926 received a severe set-back in the world depression of 1929-31, and at June, 1931, the aggregate numbers employed had fallen to 469,530—a decrease in the two years of 120,000, or over 20 per cent. The full significance of these figures is not shown until a comparison is made with the country as a whole. The following table shows the movement during the period :—

TABLE 13.—Changes in Employment in Great Britain and the North East Coast Area.

	Numbers Employed.		Index: 1924 = 100.			
	1924.	1931.	1927.	1929.	1930.	1931.
Great Britain ...	10,039,000	9,867,000	105·0	107·0	102·5	98·5
North East Coast ...	594,540	469,330	94·0	99·0	92·0	79·0
Proportion on North East Coast	5·9 per cent.	4·8 per cent.	89·5	93·0	90·0	80·0

It will be seen that the depression after 1924 hit the North East Coast much more heavily than the country generally and that while the gap was being closed somewhat by 1929, the world depression

again widened it from 8 points in the index of 1929 to 20 points in 1931. In 1924 the Area contained just under 6 per cent. of the total insured workers in employment in Great Britain. In 1929 this proportion had fallen to 5.5 per cent. and in 1931 to 4.8 per cent. The corresponding percentages of unemployment among insured workers were—1929, Great Britain 9.5, North East Coast 14.5; 1931, Great Britain 21, North East Coast 34. But the percentage of unemployment was greater on the North East Coast over the whole period. Table 14 shows the movement of employment in the principal industries during the period.

TABLE 14.—Changes in Employment in the Principal Industries of the North East Coast.

Industry Group.	Numbers Employed.		Index : 1924 = 100.			
	1924.	1931.	1927.	1929.	1930.	1931.
1. Coal and Coke ...	229,300	127,480	77.0	80.0	72.0	55.5
2. Iron and Steel	35,300	20,900	99.5	96.0	81.5	59.0
3. Engineering ...	49,200	33,100	97.5	105.0	99.0	67.5
4. Shipbuilding ...	39,200	15,000	92.0	102.0	88.5	38.5
5. Chemicals ...	4,800	6,400	146.0	324.5	280.5	133.0
6. Shipping and Waterside	18,000	15,400	110.5	114.0	95.5	85.0
7. Building and Contracting	27,900	38,600	118.5	103.5	100.5	138.5
8. Woodwork, Furniture, etc.	5,000	5,900	110.0	118.5	120.0	117.5
9. Printing and Paper	6,800	8,100	102.0	125.5	129.0	118.5
10. Food, Drink, and Tobacco	11,800	12,100	112.5	114.0	108.0	102.0
11. Distributive Trades	61,000	76,300	113.0	120.0	120.0	125.0
12. Hotel, Boarding House, Club, etc. Service	9,500	12,300	114.0	125.0	125.0	128.5
13. Road Transport	9,100	15,000	123.0	144.5	157.0	165.5
14. All Others ...	87,500	82,900	97.5	100.0	98.5	94.5

21. *The Basic Industries.*—In the group we have described as the basic industries—Nos. 1-6 in Table 14—the movement of employment is shown in the following table :—

TABLE 15.—Changes in Employment in the Basic Industries, Great Britain and the North East Coast.

—	Numbers Employed.		Index : 1924 = 100.			
	1924.	1931.	1927.	1929.	1930.	1931.
Great Britain ...	2,509,310	1,692,350	91.0	88.0	82.0	67.5
North East Coast ...	375,840	218,360	86.0	92.0	82.0	58.0
Proportion in N.E.	15.0	13.0	94.0	104.5	99.5	86.0
	per cent.	per cent.				
Proportion of all N.E. Employed	63.2	46.5	92.0	93.0	90.0	73.5
	per cent.	per cent.				

At the end of June, 1924, these industries employed an aggregate of 376,000 insured workers. Dependent immediately on coal, they suffered severely from the stoppage of 1926. By 1929 they had so far recovered as to employ 346,000—30,000 or 8 per cent. less than in 1924, but whereas this represented a fall from 63 per cent. to 59 per cent. of the total insured workers in employment in the North East Survey Area, the position of the group as a whole in the country was relatively better. The decline in Great Britain was 12 per cent., and while at the beginning of the period the proportion employed in the Area was 15 per cent., in 1929 it had risen to 15.6 per cent. In 1930-31 employment in the group fell heavily below the 1929 level to 218,500—a fall in two years of 127,500 or 37 per cent. Compared with 1924 the loss was 157,500, or 42 per cent. The slump on the North East Coast was steeper than in Great Britain as a whole, and the proportion employed fell below that of 1924 to 13 per cent. For the first time, probably, in the modern industrial history of the North East Coast, apart from periods of stoppages due to industrial disputes, the basic industries did not contain a majority of its employed workers: the proportion in 1931 had fallen to 46.5 per cent.

22. In addition to Table 14 (Par. 20), the following series of tables will bring out clearly the position of each of the six industries:—

TABLE 16.—Changes in Numbers of Employed Insured Workers in the Basic Industries from 1924.

Industry.	Increase (+) or Decrease (–) in North East.		Percentage Changes in North East.		Percentage Changes in Great Britain.	
	1929.	1931.	1929.	1931.	1929.	1931.
1. Coal and Coke ...	– 45,300	– 101,800	– 20.0	– 44.5	– 25.0	– 42.5
2. Iron and Steel ...	– 1,400	– 14,400	– 4.0	– 41.0	– 10.5	– 46.0
3. Engineering ...	+ 2,800	– 16,100	+ 5.0	– 22.5	+ 6.5	– 15.5
4. Shipbuilding ...	+ 700	– 24,100	+ 2.0	– 61.5	– 15.0	– 54.0
5. Chemicals ...	+ 10,800	+ 1,600	+ 124.5	+ 33.0	+ 15.0	– 7.5
6. Shipping ...	+ 2,500	– 2,700	+ 14.0	– 15.0	– 1.5	– 10.0
Industries 1-6 ...	– 30,100	– 157,500	– 8.0	– 42.0	– 12.0	– 32.5

TABLE 17.—*Relative Movement of Employed Insured Workers in the Basic Industries on the North East Coast and in Great Britain.*

Industry.	Percentage on North East Coast of Employed Insured in the industry in Great Britain.		Index : 1924 = 100.			
	1924.	1931.	1927.	1929.	1930.	1931.
1. Coal and Coke ...	19·5	19·0	95·0	107·5	103·5	97·0
2. Iron and Steel ...	18·0	19·5	99·0	107·5	103·0	109·0
3. Engineering ...	7·7	6·2	94·0	98·5	97·5	80·0
4. Shipbuilding ...	22·4	19·0	107·0	119·5	117·0	84·0
5. Chemicals ...	5·6	8·0	146·0	282·5	259·0	143·5
6. Shipping ...	7·6	7·2	107·5	117·0	103·5	95·0
Industries 1-6 ...	15·0	13·0	94·0	104·5	99·5	86·0

TABLE 18.—*Relative Movement of Employed Insured Workers in the Basic Industries and in all Industries on the North East Coast.*

Industry.	Percentage of total employed in North East.		Index : 1924 = 100.			
	1924.	1931.	1927.	1929.	1930.	1931.
1. Coal and Coke ...	38·6	27·2	82·0	81·0	78·0	70·5
2. Iron and Steel ...	5·9	4·4	106·0	97·0	88·5	74·0
3. Engineering ...	8·3	7·0	104·0	106·0	107·0	85·5
4. Shipbuilding ...	6·6	3·2	98·0	103·0	96·5	50·0
5. Chemicals ...	0·8	1·4	155·0	328·0	304·0	168·5
6. Shipping ...	3·0	3·3	117·5	115·0	103·5	108·0
Industries 1-6 ...	63·2	46·5	92·0	93·0	90·0	73·5

These tables show the dominating position of the coal industry on the North East Coast, and also its relative importance in the country as a whole. In June 1924 the *Mining and Treatment of Coal* provided employment for 229,300 insured workers, nearly 40 per cent. of the total in the Area, and nearly 20 per cent. of the total of such workers employed in the industry in Great Britain. By 1929, after a slow recovery from the general depression of trade and the long drawn out dispute of 1926, the number stood at 184,000; a loss of 45,300 or 20.0 per cent. The proportion of the total employed insured workers in the Area engaged in this industry had fallen to 31 per cent. This serious decline was not so great, however, as that of the industry in the country generally. In Great Britain employment in Coal and Coke in 1929 was 25 per cent. less than in 1924. In the North East the trade in coal is largely an export one and it suffered heavily in the world slump of 1929-31. At the end of June, 1931, the industry in the North East Survey Area retained only 55.5 per cent. of the number employed in 1924, having lost 47,000 or 27 per cent. in the two years—an aggregate reduction of 101,800 or 44.5 per cent. on the 1924 figure. The 127,500 workers in employment represented 19 per cent. of the aggregate employed in Great Britain, so that although subject to rather greater fluctuations owing to the export character of the trade it followed very much the same course as the industry in the country generally. From the point of view of employment, no other industry approaches coal in importance, but *Iron Ore Mining and the Manufacture of Iron and Steel* is one of the great industries of the North East Coast, and its share of the industry in Great Britain is almost equal to that of Coal. This group lost but little during 1924-1929. The number employed in 1924 was 35,300 and in 1929 it was only 1,400 or 4 per cent. less. The reduced number represented a growth from 18 to 19.5 per cent. in the North East's share of the aggregate of employed insured workers in the industry in Great Britain. The world depression which began in 1929 had, however, an even more drastic effect on Iron and Steel in the Area than on Coal. The number of employed workers in 1931 was 13,000 less than in 1929—a reduction of over 38 per cent., though, as the group had suffered less prior to 1929, the cumulative reduction of 14,400 from 1924 was rather less than in Coal; namely 41 per cent. Also it actually increased its share of employment in the industry in Great Britain to 19.5 per cent. *Engineering*, taking all branches together, more than held its own on the North East Coast during 1924-29. The number of insured workers in employment at June 1929 was 51,800—2,600 or 5 per cent. more than in 1924 and the group increased its share of the total employment in the Area from a little over 8 per cent. to practically 9 per cent. In the country as a whole it slightly lost ground, having apparently suffered more heavily from the immediate consequences of the 1926 stoppage in the coal mining industry. This group also lost more

heavily in the North East Survey Area in the slump of 1929-31; at the end of these two years the number employed had fallen from 51,800 to 33,100 or 36 per cent. In Great Britain, as a whole, the decline was under 21 per cent. in the same period. Compared with 1924, employment in engineering was 22.5 per cent. less in the Area and 15.5 per cent. less in Great Britain. Within the Survey Area the proportion of the aggregate number of employed insured workers fell to 7 per cent. in 1931. *Shipbuilding and Ship-repairing* is another industry which ended the first five years of the full period under review in a better position on the North East Coast than at the beginning. As is well known, this industry is peculiarly subject to great fluctuations in employment. The tendency is emphasised as between the centres of the industry inside the country. Like all the other basic industries—except engineering—it is highly localized. The units of production are relatively large, though the range of size is very great, and in periods of general depression a single order, especially for a large liner, may alter considerably the distribution level of employment over the few chief centres. At the end of June 1929 the number employed in this industry on the North East Coast was 39,800, an increase of 700, or 2 per cent. on the 1924 figure. On the other hand, the number employed in the industry throughout the country was less by 15 per cent. than in 1924. Thus the share of the North East Coast rose from 22.4 per cent. in 1924 to 26.7 per cent. in 1929. Shipbuilding suffered most severely of all the industries in the North East from the world conditions of the following two years, and at June 1931 found employment for only 15,000 insured workers; a drop of 62 per cent. In Great Britain the fall was rather less heavy, to 54 per cent. below the 1924 level, and the share of the North East Coast in the industry went down to 19 per cent. In the case of *Chemicals* any comparison with 1924 has little value for reasons already given in Par. 12, except to emphasise the landslide of 1930-31. In 1929 the industry employed nearly 16,000 workers in the Survey Area, a number three times greater than in 1924. At June 1931 the figure had dropped to 6,400: 9,300 or 59 per cent. below the high water level of 1929 and only one-third higher than the level of 1924. Its share of the aggregate employment of insured chemical workers in the country fell from 15 per cent. in 1929 to 8 per cent. in 1931, compared with 5.6 per cent in 1924. *Shipping and the Waterside Services* show a steady and fairly rapid rise in employment during the 1924-29 period from 18,000 to 20,500—an increase of 14 per cent. There was a slight fall in employment in these services in the country generally and the share of the North East Coast rose from 7.6 per cent. to just under 9 per cent. Within the Area they provided work for 3.5 per cent. of the total employed insured population as against 3 per cent. in 1924. In the general decline of 1929-31 they suffered relatively less than the other basic industries of the North East Coast, losing

5,200 workers (about 25 per cent.) or 15 per cent. below the 1924 level. In Great Britain generally the fall in these services in these two years was a little over 13 per cent. so that the share of the North East Coast in the national aggregate of employment in them fell to 7.2 per cent.—back in fact to the position of 1923 (see Table II in the Appendix). Owing to the relatively heavy fall in employment generally in the Area, the share of Shipping etc. remained higher than in 1924.

23. *Other Principal Industries and Services.*—The aggregate employment in all industries and services, other than the basic industries (Nos. 7-14 inclusive, Table 14), on the North East Coast increased by 24,000 or 11 per cent. from 218,600 in 1924 to 243,100 in 1929. In 1930 there was a slight set-back but in 1931, when there was a precipitous fall in world trade, they again advanced, and at the end of June, the total insured population in employment was 251,000, an increase of 32,600 on 1924. The following table illustrates the movement over the period :—

TABLE 19.—*Changes in the Employment of Insured Workers in all Industries and Services, other than the Basic Industries, on the North East Coast.*

	Number Employed.		Index: 1924 = 100.			
	1924.	1931.	1927.	1929.	1930.	1931.
In Great Britain ...	7,512,690	8,174,630	109.5	113.0	109.5	109.0
On North East Coast	218,600	250,970	107.5	111.0	110.0	115.0
Proportion on North East Coast	2.9	3.1	98.0	98.5	100.5	105.5
Employed on North East Coast	per cent. 37.0	per cent. 53.5	115.0	112.0	119.0	145.5
	per cent.	per cent.				

It will be observed that in this group of miscellaneous industries and services, which for the sake of completeness contains some which, although not included in the basic industries group above are directly allied to them, the share of the North East Coast in the aggregate of employment in Great Britain was rather less in 1929 than in 1924. In the succeeding two years the balance shifted and employment increasing at a more rapid rate in the North East than in the country generally, the proportion of the national aggregate in 1931 was 3.1 per cent. compared with 2.9 per cent. in 1924. Conversely with the decline in employment in the basic industries group, the increase in the rest taken together has, as will be obvious, made them relatively more important locally. Whereas in 1924 they contained only 370 out of every 1,000 employed insured workers in the Area, by 1931 the proportion was 535.

24. Following again the line of the analysis of the movement of the number of insured workers in Part (i), the following tables show the changes of employment in various relations in each of the principal industries and services, apart from the basic industries :—

TABLE 20.—*Changes in the Numbers of Employed Insured Workers in the Seven Principal Industries, other than Basic Industries, on the North East Coast.*

Industry.	Increase on North East Coast from 1924 (nearest 100).		Percentage Increase on North East Coast.		Percentage Increase in Great Britain.	
	1929.	1931.	1929.	1931.	1929.	1931.
7. Building and Contracting	+ 1,000	+ 10,700	+ 3·5	+ 38·5	+ 19·5	+ 23·0
8. Woodwork and Furniture, etc.	+ 900	+ 900	+ 18·5	+ 17·5	+ 17·0	+ 9·0
9. Printing and Paper	+ 1,800	+ 1,300	+ 25·5	+ 18·5	+ 12·5	+ 10·5
10. Food, Drink and Tobacco	+ 1,600	+ 300	+ 14·0	+ 2·0	+ 4·5	+ 1·0
11. Distributive Trades	+ 12,200	+ 15,300	+ 20·0	+ 25·0	+ 27·0	+ 34·0
12. Hotel, Boarding-House Club, etc. Service	+ 2,400	+ 2,700	+ 25·0	+ 28·5	+ 25·5	+ 34·5
13. Road Transport	+ 4,700	+ 5,900	+ 44·5	+ 65·5	+ 33·0	+ 38·5
14. All others ...	- 100	- 4,700	Nil.	- 5·5	+ 7·0	- 3·6
7-14 (inclusive) ...	24,500	32,400	11·0	15·0	13·0	9·0

TABLE 21.—*Relative Movement of Employed Insured Workers in the Seven Principal Industries, other than Basic Industries, on the North East Coast and in Great Britain.*

Industry.	Percentage on North East of Insured in the Industry in Great Britain.		Index: 1924 = 100.			
	1924.	1931.	1927.	1929.	1930.	1931.
7. Building and Contracting	3·8	4·3	99·0	87·0	86·0	112·5
8. Woodwork, Furniture, etc.	3·0	3·2	98·5	102·0	106·0	108·0
9. Printing and Paper	2·1	2·3	96·0	112·0	112·0	107·0
10. Food, Drink and Tobacco	2·6	2·7	107·5	111·5	104·5	101·0
11. Distributive Trades	5·0	4·8	95·5	94·6	92·5	95·5
12. Hotel, Boarding-House, Club, etc. Service	3·9	3·7	96·0	100·0	100·5	95·5
13. Road Transport	3·9	4·7	107·0	114·0	116·0	119·0
14. All others ...	2·1	2·1	93·5	93·5	98·5	98·5
7 to 14 (inclusive)	2·9	3·1	98·0	98·5	100·7	105·5

From these Tables taken with Table 14 (Par. 20), it will be seen that in the *Building and Public Contracting* group employment on the North East Coast, after a spurt in 1927 fell in 1930 to practically the level of 1924. In 1931 it leaped up to a total of 38,600—an increase over 1924 of 10,700 workers. The increase was wholly in Public Contracting, apparently mainly due to relief work carried out to counter the great increase in unemployment generally. Building remained comparatively steady throughout the period at round about 24,000. *Sawmilling, Furniture and Woodwork* employ a relatively small number of workers on the North East Coast. The number steadily increased to 1930. The group experienced a slight set-back in 1931, but at the end of the full period employed 17.5 per cent. more insured workers than in 1924. The *Printing and Paper Trades* followed a similar course, and in 1931 employed 18.5 per cent. more than in 1924. In 1929 the manufacture of *Food, Drink, and Tobacco* in the Area gave employment to 13,400 insured workers, an increase of 1,600, or 14 per cent. over the 1924 figure. In the next two years it fell again by 1,300. All of the foregoing industries and services groups had increased their share of the employment in the same groups in Great Britain. The *Distributive Trades*, very much the largest of the units under review in this paragraph, accounted for about one-half of the aggregate increase in employment among them at 1929, and for nearly one-half at 1931. Since 1924 its acceleration has been somewhat slower than the remarkable rate of the growth of this group in the country at large. At the end of June, 1931, it gave employment to 76,300 of the insured population on the North East Coast. This was an increase of 15,300, or 25 per cent. In Great Britain the increase over the period was 34 per cent. The Area's share of the total for the country is about 5.0 per cent. In the same time the proportion of the total insured employed workers on the North East engaged in these services increased from 10.3 per cent. to 16.3 per cent. They gave employment to the largest number of women and girls of all the industries and services in the Area coming under the Unemployment Insurance Acts. The other group which employs a large proportion of female labour is *Hotel, Public-House, Restaurant, Boarding-House, Club, etc., Service* which shows an even greater relative growth though on a much smaller scale—from a total of 9,500 in 1924 to 12,300 in 1931: an increase of 28.5 per cent. Up to 1930 employment in these services kept fairly even pace with the increase in the country as a whole, but in 1930-1 lost ground a little as the increase in Great Britain was then 34.5 per cent. The double parallelism of the movement of employment in the *Distributive Trades* and in *Hotel, Boarding-House, etc., Service* on the North East Coast and in Great Britain, as a whole, is remarkable. The *Distributive Trades* and *Hotel, Boarding-House,*

Club, etc., Service together employ more than one-half of the aggregate of insured women and girls on the North East Coast. In *Tramway, Omnibus, and other Road Transport* the increase in employment has been very great. In 1924 the total number of insured workers on the North East Coast employed in these services was 9,100. By 1931 it had steadily grown to 15,000—an increase of 65.5 per cent. This was considerably in excess of the rate of increase in the country as a whole, which, though steady over the period, was only 38.5 per cent. at the end of it. Within the Survey Area the proportion of the total employment provided by road transport increased from 3.9 per cent. to 4.7 per cent. Against the great increase in road transport has to be set the loss in employment in *Railway* traffic. For the purpose of this Survey the London & North Eastern Railway supplied a census of their total staff employed in the Survey Area in 1924, 1928, 1930, 1931. These figures show a decrease from 35,550 in 1924 to 28,830 in 1931. Probably some part of this loss of nearly 7,000 is due to the transfer of goods and passenger traffic to road transport but how much it is impossible to say. In *Agriculture* the returns made to the Ministry of Agriculture and Fisheries for Northumberland and Durham indicate a slight increase of about 2 per cent. in 1927, the number in employment being stationary from that year to 1930 inclusive, while in England and Wales there was a decrease of 2 per cent. at 1930.

25. *Employment of Male and Female Workers.*—In Part (i), Par. 6, it was shown that while the North East Coast contains a much smaller proportion of women workers than the average for Great Britain as a whole, that proportion has been steadily increasing. The following tables show separately the movement in employment of insured males and females :—

TABLE 22.—*The Movement of Employment of Insured Male Workers on the North East Coast and in Great Britain.*

	Numbers (Aged 16-64).		Index : 1924 = 100.			
	1924.	1931.	1927.	1929.	1930.	1931.
Great Britain ...	7,319,000	7,012,400	104.0	105.0	101.5	96.0
North East Coast	520,720	386,450	92.0	97.5	90.0	74.0
Proportion of North East	7.1	5.5	88.5	92.5	88.5	77.0
	per cent.	per cent.				
Proportion of all Employed on North East Coast.	87.6	82.3	98.0	98.0	97.0	94.0
	per cent.	per cent.				

TABLE 23.—*The Movement of Employment of Insured Female Workers on the North East Coast and in Great Britain.*

	Numbers (Aged 16-64).		Index: 1924 = 100.			
	1924.	1931.	1927.	1929.	1930.	1931.
Great Britain ...	2,720,000	2,854,000	108.0	111.0	106.0	105.0
North East Coast ...	73,820	82,910	106.5	112.0	111.0	112.0
Proportion of North East	2.7	2.9	99.5	100.5	106.0	106.5
	per cent.	per cent.				
Proportion of all Employed on North East Coast	12.4	17.7	113.0	113.0	119.0	143.0
	per cent.	per cent.				

These tables give statistical exactness to general inferences which will have already emerged from the analysis of the movement of employment. The North East Coast, as a heavy-industry area, and for other reasons suggested in Par. 6, provides employment for relatively greater numbers of males and fewer females than the average for the country as a whole. While the share of the North East in the total employment in the country was in 1924 barely 6 per cent., its share of employed males was over 7 per cent. and of females only 2.7 per cent. From 1924 to 1929 that position was gradually changing. At the end of June, 1929, the proportion of employed insured males had fallen to 6.6 per cent. and that of females had risen slightly to 2.72 per cent. While the total number of males in employment in the country generally was greater in 1929 by 5 per cent., in the Survey Area it was less by 2.5 per cent. In the case of females employment had increased over the same period in both Great Britain and on the North East Coast at a fairly equal pace—11 per cent. and 12 per cent. respectively. In the 1929-31 slump period these tendencies were accelerated. At June, 1931, the share of the North East in the total employment of insured persons in the country was 4.8 per cent. Of male employment it was 5.5 per cent. and of female employment, 2.9 per cent. The number of men and boys employed in Great Britain fell to 7,012,400—4 per cent. below the 1924 level. On the North East Coast the fall was from 520,720 to 386,450 or 26 per cent. The employment of women and girls in Great Britain fell to 5 per cent. above the 1924 level while in the Survey Area it remained at 12 per cent. higher. As a result of these changes the proportion of men and boys in the total of employed insured persons on the North East Coast fell from 87.6 per cent. in 1924 to 86 per cent. in 1929 and 72.3 per cent. in 1931. That of women and girls rose correspondingly from 12.4 per cent. to 14 per cent. and 17.7 per cent.

Summary.

26. The main facts which emerge from this analysis of the movement of employment among insured workers on the North East Coast are :—

(1) That from 1924 to 1929 the basic industries moved generally with the movement in this group in the country as a whole.

(2) That the larger fluctuations in trade appear to hit the basic industries more heavily on the North East Coast than in the country generally. This is evident in a comparison with the effects of the depressions of 1925-6 and 1930-1 and is particularly more apparent in the latter for which the world-wide depression in trade was more completely responsible. The greater sensitiveness to world movements appears to be mainly due to the relative importance of export trade, especially in the coal industry, and of shipbuilding, on the North East Coast. The predominant part played by a few industries all of them inter-dependent and based on one, namely coal, which employs by far the greatest number of workers in the Area, means that when the world demand for capital goods is strong, employment in the Area is good and *vice versa*. A particularly good illustration of the extremes of good and evil effects on employment resulting from such conditions is found in the brief history, so far, of the Imperial Chemical Industries. The policy of this great combination of centralizing its production in one or two large centres, one of them on the North East Coast, expanded enormously the field of employment for workers in this industry in the Area, and a new town sprang up dependent on it alone. The world-fall in trade has contracted the field to very nearly its original size and over 9,000 workers lost employment in it during 1929-31.

(3) The decided contrast of the history of the principal industries and services outside of the basic group. The very great advance of the definitely consumption trades, wholesale and retail dealing, public domestic services, etc., may appear to give hope that they, with the light manufacturing industries, will at least provide a sufficient make-weight to the loss in those industries which have hitherto been the mainstay of the Area. The increased opportunity for the employment of women is in itself a good thing. But when accompanied by a still greater fall in the work available to men it is a sign of weakness rather than of strength. The net contribution of the North East Coast to the sum of national well-being in terms of economic wealth is definitely less.

27. We should like to emphasize the fact that the analysis shows that, speaking broadly, employment in the various industries and services on the North East Coast is dependent on the general

course of trade and employment in the country as a whole, and that the Area contains a large proportion of the industries which have nationally and internationally lost ground heavily during the period reviewed. It is unnecessary to repeat the reasons advanced in Par. 17 for our view that, as things are at present, it does not seem likely that any permanent loss in employment in these industries can be balanced by a relative improvement in the other industries.

(iii) Unemployment—Labour Demand and Supply, 1932-36.

Introductory.

28. In Part (ii) the movement in employment was used rather than unemployment as a measure of the changed economic conditions so far as their effect on labour was concerned. Before the war there were no comprehensive statistics available for measuring the periodic changes in the numbers of employed men and women. For unemployment there were the returns made to the Board of Trade by certain Trade Unions who paid unemployment benefit to their members. These returns were useful as they covered a good sample of the workers in the principal manufacturing and constructional industries. While, therefore, they provided no information as to the numbers in employment, they served as a measure of the changes in industrial prosperity. The cyclical fluctuations in trade were not so prolonged as to seriously affect the supply of labour attached to each industry. Most of the Unions making the returns were largely composed of skilled men, the supply of which is not highly sensitive to short-run variations in employment. Since the War the conditions both of statistical information and of trade have vastly altered. The post-war extension of Unemployment Insurance has not only provided an almost complete record of unemployment, but also of the total supply of labour, and therefore of employment in each industry: the long-continued post-war depression has produced a considerable shift of labour from the industries most seriously affected to others which are either expanding or less affected. Thus while for the country as a whole the periodic comparison of the relation between the demand for labour and the supply available, provided by the percentage of unemployment, is a good measure of economic conditions at different times, this is not so true of the particular industries. At any one date a comparison of the ratio of the total insured and employed insured persons in each industry is a fairly accurate measure of their relative prosperity at that date; a comparison of this ratio for any one industry in different years is not so reliable a guide as a comparison of the actual numbers employed in it at these different times. For the number insured in that industry may have been subject to considerable change through transfers to other industries. This change will vary in amount in different kinds of industries. Among unskilled or general workers, movement from

industry to industry has always been comparatively sensitive to the variations in demand, though this mobility is by no means frictionless. So that industries employing large proportions of this class of labour will tend to show considerable changes in the supply of labour available, as measured by the numbers of persons insured in them. On the other hand, skilled labour does not find it so easy to move from industry to industry. Changes from occupation to occupation are less easy than from industry to industry. Skilled occupations are highly specialized and to the ordinary "frictions", such as "the market", which in some degree applies to all workshops, has to be added in their case an identity of specialized industrial and occupational skill. This again varies from industry to industry. The skilled engineer, fitter and turner and the like, has little opportunity to move out of the group of engineering industries—general, marine, electrical and constructional—inside which he moves fairly freely; whereas the woodworking craftsman may move between shipbuilding and the building trade without changing his occupation: the riveter, plater, etc., from shipbuilding to constructional engineering and to modern building, and so on. But taking labour in the Survey Area as a whole, the relation between the aggregate of insured persons and the numbers of those employed from time to time, may be used to give an indication of the relation between the demand for and the supply of labour.

29. *Unemployment*.—From this point of view the position on the North East Coast is a serious one. Over a long period the supply of labour has been much in excess of the demand. The only statistics available for the Survey Area are, unfortunately, not satisfactory for the purpose of arriving at an accurate measure of the incidence of unemployment from year to year. They refer only to the position at one date—the fourth Monday in June—in each of the years 1923, 1927, 1929, 1930 and 1931. It is not possible to say whether the figures for that date are even approximately representative over any longer period than one week. They are, however, all that can be got, and Table III. in the Appendix has been compiled from them. For the years 1923-1927 inclusive the numbers have been made comparable with the later years by the method described in Par. 4. The percentages of unemployment are of course unaffected by this correction.

30. It will be seen from this table that the aggregate amount of unemployment on the North East Coast during the period has never been less than 12.8 per cent. of the total insured persons—the figure for 1924; while in 1931 one-third of the insured population was out of work. The average of the figures for the one date in each year given is over 20 per cent.—that for men alone 23 per cent. This is considerably worse than the amount of unemployment in Great Britain as a whole, for which the figures for the same dates were—1924, 9.4 per cent.; 1931, 21.0 per cent.; and the average for the same years as the North East Coast barely 13.0

per cent. This has created an unprecedented social problem in the Area. It would appear that the Area carries a large permanently redundant supply of labour. In the coal industry particularly, the Government has taken action in an organized effort to reduce the redundancy by the transfer of miners to other areas and to other occupations. The estimates made in the special memorandum on coal mining, regarding the position of labour in that industry, show that considerable success has attended the transfer scheme. There is no need here to stress the social evils of prolonged excessive unemployment. An attempt is made in the following analysis to arrive at some estimate of the demand for and supply of labour on the North East Coast during the next five years.

1.—The Demand.

31. Following the lines taken in Parts (i) and (ii) the problem of the demand for labour on the North East Coast during the period 1932-36 inclusive is divided into (1) the Basic Industries, (2) other Principal Industries and Services, with (3) a summary giving the aggregate results.

32. *The Basic Industries.*—In the Basic Industries male labour is of course predominant. The maximum demand was in 1924, and that year and 1929, another minor peak, may be taken as the best guides to the future position. The figures are :—

	<i>Males.</i>	<i>Females.</i>	<i>Total.</i>
1924	371,000	4,800	375,800
1929	341,500	4,400	345,900

Taking into account the views of employers and Trade Union leaders regarding the probable maximum demand during the next five years and making what deductions seem possible from the movement of employment since 1924, we venture the following estimate of the maximum demand for labour in the Basic Industries on the North East Coast during that period. The estimate assumes no important change in the methods or nature of the industries coming into this category.

TABLE 24.—*Estimated maximum demand for labour in the Basic Industries on the North East Coast 1932 to 1936.*

Industry.	Males.	Females.	Total.
1. Coal and Coke	199,700	300	200,000
2. Iron Ore and Iron and Steel Manufacturing	35,600	400	36,000
3. Engineering	50,200	2,300	52,500
4. Shipbuilding and Ship-repairing	39,550	450	40,000
5. Chemicals	14,200	800	15,000
6. Shipping and Waterside ...	19,650	350	20,000
Totals, 1-6	358,900	4,600	363,500

33. *Skilled Labour*.—There does not appear to be any material change taking place in the relative demand for skilled as against semi-skilled and unskilled labour. Mechanization we are informed by the associated employers concerned has not—except in the cases of coal-mining and iron and steel manufacture—had any serious effect on the demand for labour. This appears likely enough in relation to the short period of seven years. But it is not easy to accept the further statement that since the War the movement in this direction has not been greater than in the years preceding the War. It is, of course, possible that the greater part of the undoubtedly considerable speeding up of this movement occurred during the War itself, when it presented no problem of consequential unemployment. What concrete evidence we have seen of displacement of labour by the introduction of labour-saving machinery has been scrappy and quite inadequate as a basis for any statistical measurement. We have been told by Trade Unionists and others in a position to know something of the facts, that the evidence we have is representative of a movement which causes a considerable lessening of the demand for labour. Mechanization may well be slower on the North East Coast than elsewhere. Industrial organization is here comparatively simple both horizontally and vertically. The basic industries are a group of a few clearly differentiated industries with little sub-division within them, owing to their "heavy" character. Vertically the lines between skilled, semi-skilled and unskilled labour, especially between the first and the other two, are, compared with, say, the engineering and metal trades of the Midlands, clean cut. There is little of the lighter mass-production type of industry in which mechanization is so typical. As a result, while undoubtedly there have been changes in the methods of production they have not been on any great scale—again with the important exception of coal mining and iron and steel manufacture, which do not employ skilled men, in the sense of apprenticed-trained men, in their processes. Here and there new machines and processes involving displacement and adjustment of labour have been introduced, but the most potent change appears to have been more general, at any rate since the War. The evolution of organization in production rather than any great change in particular processes has on this view been responsible for the great increase in productivity evidenced by the comparison between output before and since the War. That effect, it seems clear, has been fairly equally spread over all classes of labour. At any rate it has not materially altered the proportion of skilled men—that is, men who have "learned their trade" as apprentices—as is shown by the following figures supplied by the Employers' Associations in the Engineering and Shipbuilding Industries :—

TABLE 25.—*Proportion of skilled and other classes of Labour in the Engineering and Shipbuilding Industries on the North East Coast at certain dates.*

Industry.	Date.	Number of Men.	Percentages.			
			Skilled.	Semi-skilled.	Unskilled.	Miscellaneous.
Engineering ...	Sept. 1913	34,000	46.5	22.8	22.4	8.3
	March 1925	28,000	45.3	23.6	20.7	10.4*
	March 1931	16,000.	43.2	23.5	20.2	13.1†
Shipbuilding and Ship-repairing.	March 1913	37,000‡	47.0	12.6	25.1	15.3
	March 1925	17,000‡	49.5	17.3	22.6	10.6
	Sept. 1930	17,000‡	47.6	15.1	32.8	4.5

* Including women 2.0.

† Including women 3.2.

‡ Including boys but not apprentices.

These figures, taken at different periods before and after the War and relating to greatly varying totals of workers employed, show that generally the proportion of skilled operatives to other classes of workers has remained remarkably steady. As they include all types of occupations in the two groups of industries there may of course have been some shift in the relative proportions of each of the skilled occupations—fitters, turners, platers, riveters, shipwrights etc.—but if that has occurred it has been balanced by compensating opposite changes in others. There is a slight tendency to a reduction in the proportion of skilled men in engineering. In shipbuilding the only observable change suggests an increase in the proportion of semi-skilled men and a decrease in unskilled—due presumably to work formerly done by manual labour now being done by mechanical means, e.g. motor-driven in place of hand-pushed trucks in shops and yards. In the absence of any visible trend it must therefore be assumed that while the demand for particular kinds of skilled labour may be changing, for skilled men as a whole the demand will be the same in proportion as for all other kinds, and no modification of the general estimate given above is necessary in respect of it. For the same reasons there does not appear to be any likelihood of any change in the relative demand for male and female labour in these industries. Table III,

App. also shows that the demand for boy labour (16-18) moves closely with that for men: from 1924 to 1929 inclusive, the movement is almost identical.

34. *Other Industries and Services.*—The other industries and services present a more difficult problem. They are practically all expanding on the North East Coast and any estimate of their future is much more of a guess than in the case of the basic industries. In addition it has been much more difficult to get authoritative information about any of them. The groups include a great variety of work and service and there is comparatively little organization among employers and in a number of cases little among employees. The estimates of future demand are perforce based mainly on the movements shown in the Unemployment Insurance statistics shown in Table II in the Appendix. Where possible the information regarding future development gathered from other sources has been taken into account.

35. The aggregate demand for labour in these industries at June 1924, 1929, 1931 was:—

	<i>Males.</i>	<i>Index.</i>	<i>Females.</i>	<i>Index.</i>	<i>Total.</i>	<i>Index.</i>
1924	149,700	100·0	69,000	100·0	218,700	100·0
1929	165,200	110·4	78,200	113·3	243,400	111·3
1931	172,400	115·2	78,600	113·9	251,000	114·8

It will be observed that while the demand for women in these industries has remained stationary from 1929, that for men has increased by nearly 5·0 per cent. This appears to be due to the great increase in 1930-31 in the number of men employed upon road and other forms of relief work noted in Par. 24. The movement from 1924 to 1929 is therefore a better guide to the aggregate demand in the future. As regards the individual industries, regard to the effect of the 1929-31 slump in trade generally on each of them is an important factor. The following table gives the estimate we venture to make on the data available:—

TABLE 26.—*Estimated maximum demand for labour during 1932-36 in the Seven Principal Industries and Services, other than Basic Industries, on the North East Coast.*

<i>Industry.</i>	<i>Males.</i>	<i>Females.</i>	<i>Total.</i>
7. Building and Public Contracting	29,600	400	30,000
8. Sawmilling, Furniture, etc.	5,100	900	6,000
9. Printing and Paper	6,300	3,200	9,500
10. Food, Drink, and Tobacco	6,500	7,000	13,500
11. Distributive Trades	40,000	42,000	82,000
12. Hotel, Boarding-house, etc.	3,600	9,600	13,200
13. Road Transport	15,400	1,100	16,500
14. All others	66,500	21,000	87,500
Totals	173,000	85,200	258,200

These estimates show an increase on the actual demand for male labour (number employed) at June, 1924, of 15·6 per cent., and on the demand at June, 1929 of 5 per cent.

Summary.

36. The total estimate of the maximum aggregate demand for labour in insured occupations likely to arise on the North East Coast during the next five years, 1932-36, is therefore :—

532,000 Men and Boys, 90,000 Women and Girls,
Total, 622,000.

These figures are in the case of male labour 2.0 per cent. above the number in employment at the end of June, 1924, and nearly 5.0 per cent. above the 1929 figure, and in the case of female labour 22.0 per cent. above 1924 and 8.5 per cent. above 1929.

2. The Supply.

37. If the attempt to estimate the maximum demand for labour in the North East Coast Survey Area during the next five years has been difficult and the result highly speculative, an estimate of the probable supply of labour in the immediate future is still more hazardous. Unemployment Insurance does not cover the whole population available for employment. The field outside insurance contains about 30 per cent. of the total occupied population and it provides alternatively a source of recruitment to insured occupations or an attraction from them, in the event of changed conditions in either group—e.g., Railway Traffic largely uninsured, to Road Transport insured. It is unlikely, however, that any material change in this respect will occur within the period under consideration. Those outside insurance include boys and girls under 16 years of age, a very large proportion of whom are engaged in insured industries. The great majority of the others are attached to agriculture and private domestic service. The present tendency is for the numbers in these to contract, but the movement is very slow.

38. The problem may be narrowed by excluding female labour from consideration. As already shown (Pars. 6 and 25 above) the proportion of the female population on the North East Coast engaged in industry is much smaller than in the country generally. The difference is being reduced, and in this connexion the relatively greater increase in the number of Girls, both insured and employed, should be noted in Tables 27 and 28 below. But the proportion of female labour in the Survey Area is still only about half that of the average for Great Britain. This margin is so great that it is exceedingly difficult to make any estimate of the number who will be available for employment in the immediate future and little purpose would be served by it. The real problem is that of the supply of male labour.

39. *Factors influencing Supply 1924-31.*—The following tables extracted from Table III App. show the movement in the numbers of Unemployment Insurance books exchanged and lodged at July and in the numbers of insured persons in employment on the fourth Monday in June in each of the years 1924, 1927, 1929, 1930,

1931, distinguishing Men, Boys, Women and Girls. Boys and Girls are those aged 16 years and under 18.

TABLE 27.—*Movement in numbers of Insured Persons on the North East Coast.*

	Numbers.		Index : 1924=100.			
	1924.	1931.	1927.	1929.	1930.	1931.
Men ...	561,120	574,930	99·7	100·0	101·2	102·5
Boys ...	41,340	38,320	95·5	96·6	96·0	92·7
Women ...	67,260	82,810	105·0	109·5	116·0	123·0
Girls ...	12,280	16,030	108·5	120·5	127·5	130·5
Totals ...	682,000	712,090	101·1	101·1	103·0	104·5

TABLE 28.—*Movement in numbers of Insured Persons in Employment on the North East Coast on the Fourth Monday in June.*

	Numbers.		Index : 1924=100.			
	1924.	1931.	1927.	1929.	1930.	1931.
Men ...	480,960	354,480	91·8	97·3	89·5	73·7
Boys ...	39,760	31,940	93·0	97·0	91·8	80·3
Women ...	62,120	68,540	106·4	110·4	108·6	110·3
Girls ...	11,700	14,370	108·8	120·0	125·0	122·8
Totals ...	594,540	469,330	93·6	99·1	92·3	78·9

TABLE 29.—*Movement in numbers of Insured Persons Unemployed on the North East Coast on the Fourth Monday in June.*

	Numbers.			Per cent. of Insured.				
	1924.	1929.	1931.	1924.	1927.	1929.	1930.	1931.
Men ...	80,160	93,060	220,450	14·1	21·0	16·6	24·3	38·3
Boys ...	1,580	1,400	6,380	3·1	6·3	3·5	7·0	16·6
Women...	5,140	5,110	14,270	7·6	6·4	6·9	13·6	17·2
Girls ...	580	740	1,660	4·7	4·5	5·0	6·6	9·0
Total North East.	87,460	100,310	242,760	12·8	18·4	14·5	21·7	34·1
Great Brit in.	1,039,000	1,118,000	2,633,000	9·4	9·9	9·5	15·2	21·0

40. From Table 27 it will be seen that the number of insured Men (18-64) in the Survey Area in 1931 was only 2.5 per cent. greater than in 1924, and that until 1929 it was stationary. The statistics available for Great Britain over the full period do not enable us to distinguish Men from Boys, but figures published in the Ministry of Labour Gazette, November, 1931 (page 414), show

that from 1928-9 to 1931 there was an increase of insured Men of 5.0 per cent. In Great Britain since 1928 there has been a considerable decline in the net rate of exit from insurance—from 4.5 per cent. of the total insured males to 1.8 per cent. in 1931. Despite a slight fall in male new entrants this has resulted in an acceleration in the total male insured in the last three years. The influences which have produced this result are briefly discussed in the Ministry of Labour Gazette quoted. The factors are found to be—reduced emigration from the country; fewer insured entering business on their own account and more giving up such business; reductions in remuneration bringing a number of non-manual workers within the insurance limit of £250 per annum; changes in the regulations governing eligibility for benefit and increases in the amount of benefit; fewer opportunities for juveniles to enter insured occupations (juveniles form about 75 per cent. of the annual number of new entrants); and the drop in the birthrate during the War years now beginning to affect the number of boys reaching the insurance age.

41. The relative stationariness of the number of Men insured on the North East Coast can be ascribed only to the different operation of these influences in the Area. Those directly due to the depression in trade may be presumed to have had a greater relative effect on the North East Coast where that depression was more severe. A considerable amount of emigration to other areas has taken place for the same reason. From the Registrar-General's estimates it has been calculated that in Durham and Tyneside there was a loss in population through emigration, in the period 1926-29, of 123,000 persons (Minutes of Evidence before the Royal Commission on Unemployment Insurance, January 23rd, 1931). The number of insured persons involved is not discoverable, but it is undoubtedly large. It is known that considerable numbers of insured men have been transferred to other parts of the country through the Tyneside and Tees-side Employment Clearing-Houses and the special Transfer schemes in the coalfield. Our information is that this emigration has slowed down since 1929—a result, doubtless, of the general heavy fall in employment. Unfortunately, no figures for new entrants into insurance in the Survey Area are available, but it will be seen from Table III, App. that the number of Boys insured is in much closer correlation with the movement in employment than in the case of Men. This was to be expected. A boy does not enter into insurance until he is working at an insured occupation at the age of 16 or over, and when opportunities for such work are relatively scarce the new entrants into insurance will be fewer. The rate of new entrants into insurance in the Survey Area appears to have been markedly lower than in the rest of the country.

42. *Factors Affecting Future Supply.*—If there is a recovery in the demand for male labour of the order we have estimated, then it would appear that the economic influences retarding exit from insurance will tend to lessen their force. The present revision

of the conditions of Unemployment Benefit will have a similar tendency. Whether emigration will continue on its present reduced scale will depend on the relative conditions of employment on the North East Coast and in other parts of the country. In our opinion there is little prospect of the Area improving in that respect in the near future, and some emigration will probably continue. As regards the number of boys available for new entry into insurance, we have been supplied by the Ministry of Labour with an estimate of the number of boys and girls who have left school, or are expected to leave school, for purposes other than for further education, in each of the years 1926 to 1938. The figures do not include the purely rural parts of Northumberland. From 1932 on, they were calculated on the assumption that the school leaving age was to be raised to 15 years; but this has been corrected by increasing the numbers for these years by 1.5 per cent. A small number of these school-leavers will be 15 years of age and even more, but this may be ignored. In Table 30 below, the number leaving school in the second preceding year has been taken as the number available for employment in insured occupations—though, of course, all of them will not be entering such occupations. The total number of insured boys approximates fairly closely to the number of boys estimated to have left school in the second and third preceding years, practically all of whom would be in the appropriate age-group (16 up to 18 years). For example, the number of boys who left school in 1927 and 1928 totalled 42,300, and the number of boys insured at July, 1930, was 39,640. In any case the proportion of the total school-leavers who are available for industry is not likely to vary appreciably and, therefore, the change in numbers will provide a measure for the rate of new entrants into industry. The following table shows the total numbers of boys and girls estimated as leaving school at 14 and who would be 16 during the full insurance year beginning in July of the following year. That is to say the number leaving school during the year ending March, 1928, would reach the age of entry into insurance during the year 1929-30.

TABLE 30.—*Estimated Numbers of Boys and Girls leaving School in the North East Coast Industrial Area who will have reached the age of 16 years during 1932-1936.*

Year at July.	Numbers.			Index: 1931=100.		
	Boys.	Girls.	Total.	Boys.	Girls.	Total.
1931 ...	21,211	20,471	41,682	100·0	100·0	100·0
1932 ...	19,930	18,882	38,812	94·0	92·2	93·1
1933 ...	19,639	18,677	38,316	92·6	91·2	91·9
1934 ...	19,390	18,410	37,800	91·4	89·9	90·7
1935 ...	19,188	18,155	37,343	90·5	88·7	89·6
1936 ...	21,198	20,245	41,443	99·9	98·9	99·4

It will be seen that the number of boys available for entry into insurance declines sharply by 6.0 per cent. in 1932, and decreases much more slowly until 1935 to 9.5 per cent. less than in 1931. In 1936 it rises to the level of 1931. Against this apparent decline there is to be put the possibility of a return of some of the men transferred during 1926-29, which will not only bring back into the aggregate of insured persons the men themselves, but also some of their children who have reached or will reach during the next five years the age of entry. There is no means of estimating this number, but it is not likely to be large. Most of those men who do return will have been transferred to more or less temporary jobs, such as public contracting, and will not have taken their families with them if they have such dependants.

43. *Estimated Supply of Labour, 1932-1936.*—It is not possible to say how much of the difference between the net rates of increase in insured men and boys in Great Britain and on the North East Coast respectively is due to the greater rate of exit on the one hand or the smaller rate of new entry on the other, in the Survey Area. On the whole it would appear to be due more to the former than to the latter. Further, the smaller number of new entrants does not necessarily mean a proportionately smaller potential supply of young workers; a number of these will have been unable to get a footing in insured occupations owing to the heavy decline in employment in the Area since 1929, and these are still available. Assuming that the rate of exit on the North East Coast will continue to be nearer to the pre-1929 rate for the country as a whole, and that the new entrants will be rather fewer due to the fall in the birth-rate during the War years, the effect of which will be felt for the next four years, we estimate that the total number of insured male workers will not rise appreciably above the number at July, 1931, and may fall somewhat below it, say 0.5 of 1 per cent. either way. On a total of 613,000 at July, 1931, this gives an upper limit of 616,000 and a lower limit of 610,000. As a single figure we suggest 612,000.

44. *Estimated Surplus.*—As our estimate of the maximum demand during the next five years is 532,000 this leaves a surplus of 80,000 insured workers of 16-64 years of age. It is true that this does not represent the total available male labour as there will be a number not at present included in the Insurance statistics. But the exact number is not of great importance. This surplus will give a minimum percentage of unemployment of approximately 15.0 per cent. If the estimated maximum represents a real boom under what is assumed to be normal conditions for some considerable time, then the aggregate floating reserve of labour to allow for changing from job to job and other factors should not be more than 3.0 per cent., in which case the aggregate redundant male labour on the North East Coast in insured occupations will be in the region of 64,000 workers.

45. *Skilled Labour*.—It does not follow that the estimated surplus will be equally spread over all industries and occupations. So far as the separate industry groups are concerned, the special memoranda dealing with these must be consulted, but we have attempted here an analysis of the general position regarding skilled labour—especially in the engineering and shipbuilding industries. If, on the basis of the figures already quoted, showing the proportion of skilled to other classes of labour, we assume that 43 per cent. of the demand for labour in the engineering group will be for skilled workers, then the estimated maximum demand during the next five years for this class of workers will be 22,600 in insurable occupations. The North East Coast Engineering Employers' Association state the number of apprentices employed and the number of workers in the works making returns to them at various dates, to have been as follows :—

September, 1913	...	Men Employed	34,000	
		Apprentices	7,316	or 17·4 per cent. of total.
March, 1925	...	Men Employed	28,000	
		Apprentices	5,546	or 16·5 per cent. of total.
March, 1931	...	Men Employed	16,000	
		Apprentices	4,821	or 23·0 per cent. of total.

The proportion of apprentices appears, therefore, to be fairly closely correlative to the number of workers employed, and to be rather higher when employment generally is low. The estimated maximum demand for workers in this group of industries is about equal to the total number employed in 1929 and about 5 per cent. above the average for 1924-1929, so that the number of apprentices then in the industry should be at least equal to providing the necessary recruitment of journeymen skilled workers required during the next five years. The Amalgamated Engineering Union and other Trade Unions concerned state emphatically that the supply of all kinds of skilled workers will be more than adequate to any conceivable demand. The Employers expressed a fear that there might be a shortage of good turners. This is not, of course, inconsistent with the view that the aggregate supply of skilled workers will be at least sufficient, but it appears to us that unless the demand is considerably greater than either the Employers or we ourselves estimate, it is not likely that the fear will be justified.

46. In shipbuilding the situation is more complicated. Several kinds of skilled labour in this industry are inter-changeable with other industries—building, constructional engineering, etc. The percentage of skilled men may be taken as about 48. On this basis 19,200 will be required to meet our estimate of the maximum demand during 1932-36. There also is a rough correlation between the number of total workers employed and of apprentices in the

post-war years. The following figures were supplied by the Associated Employers in the Area :—

March, 1913 ...	Workers other than apprentices employed	... ..	37,000
	Apprentices	... ..	5,701 or 13·4 per cent. of total.
March, 1925 ...	Workers other than apprentices employed	... ..	17,000
	Apprentices	... ..	3,855 or 18·5 per cent. of total.
March, 1930 ...	Workers other than apprentices employed	... ..	16,800
	Apprentices	... ..	3,471 or 17·0 per cent. of total.

As the total maximum number of workers and therefore of skilled men estimated to be required during the next five years is about equal to the numbers employed in 1924 and in 1929 it would appear likely that the number of skilled journeymen will be adequate. The Shipbuilding Trade Unions in this case also have no fear of any shortage. The Employers consider that there may be a shortage of riveters. The Trade Union reply is that while they do not see any grounds for the Employers' doubts, any unforeseen shortage of riveters could be easily supplied by caulkers, the demand for whom is lessening owing to changes in processes.

47. There does not then appear to be any likelihood of a shortage of skilled labour on the one hand, or of any great redundancy on the other, if our estimate of the maximum demand is realised. If by any chance there was a return to the maximum of the years immediately following the War a shortage of the more highly skilled workers might occur.

48. We have had some evidence put before us showing that the experience of long-continued unemployment by highly skilled workers accustomed to work of very great precision has at least temporarily reduced their capacity for such work; depending as it does on delicacy of touch in working with gauges to thousandths of an inch. On the other hand it may be added here that the severe degree of unemployment does not appear to have had any serious effect on the general efficiency of the workers who have been out of work. The Ministry of Labour supplied us with tables showing for the Survey Area some of the information derived from a half-per-cent. sample of the persons on the Live Register taken on 2nd February, 1931. 586 persons of all ages were interviewed with a view to discovering their degree of employability. Of these, 68.6 per cent. were adjudged to be qualified on all grounds—industrial and personal—for employment having no exceptional features, in the applicant's occupation: 19.1 per cent. qualified by industrial experience but doubtful of acceptance on personal grounds, e.g., health: 8.9 per cent. were held to be acceptable on personal grounds but doubtful on grounds of industrial experience; and only 3.8 per cent. doubtful of acceptance on both personal qualifications and industrial experience. 69.8 per cent. were of good physique and 81.9 per cent. in good health.

Summary.

49. Summarizing our conclusions as to the demand for and supply of labour on the North East Coast during the next five years, 1932-1936 inclusive, we estimate that there may arise a redundancy of about 64,000 male workers in insured occupations, few of them if any in the skilled worker class. How far there is any possibility of this unwanted surplus being absorbed by the introduction of new industries into the Area will be discussed in the general Report of the Survey. So far as it can, or so far as the problem can be solved by transfer either to the same occupations or to new ones outside the Survey Area, the question of mobility, territorial and occupational, will arise. That is the subject of Part (iv) of this Memorandum.

(iv) Mobility of Labour.*Introductory.*

50. The problem of dealing with the estimated redundant supply of male labour on the North East Coast, given the possibility of its removal outwith the Area or of the introduction of new industries, will be conditioned largely by the degree of mobility existing in the present industrial population. So far as the new-comers into industry are concerned, the frictions to be overcome are mainly of a social and not industrial nature. The question is different when we are dealing with older workers who have domestic responsibilities and local ties to consider when asked to remove to a distance, or who are offered employment in new occupations where their experience, training, and industrial habits may have to be adjusted to new and unaccustomed conditions of work.

1. Territorial Mobility.

51. In order to get some idea of the degree of willingness and ability to move from place to place at present existing among the workers engaged in industry on the North East Coast the Ministry of Labour, North Eastern Division, was asked and willingly consented to make a survey of the Unemployment Books exchanged in July, 1931, at selected Employment Exchanges in the Survey Area. The results are summarized in Tables IV, V, VI, and VII in the Appendix to this Memorandum, and are analysed in the following paragraphs, 52 to 73 inclusive, for which Mr. Ernest Davison is responsible.

52. The observations in this section are based, so far as statistics are concerned, on an analysis of Unemployment books relating to ten selected industries (viz., Coal-mining, Shipbuilding and Repairing; Building; General Engineering; Pig Iron and Steel Manufacture; Chemicals; Canals, Rivers and Docks; Road Transport; Printing; Distributive Trades) in the case of men, and six in

the case of women (viz., Distributive Trades; Hotel, Boarding House, etc.; Printing; Tailoring; Bread, Biscuit, Cake Making; Food), exchanged during the annual exchange of books at twelve selected Exchange areas within the Survey Area, in July, 1931. The total number of books analysed was 221,342 or 33.7 per cent. of the total insured population (18-64) of the Survey Area.

			<i>Lodged Books.</i>	<i>All others.</i>	<i>Total.</i>	<i>Percentage of total insured population. (18-64)</i>
Women ...	...	...	7,368	28,683	36,051	43.5
Men ...	...	...	70,455	114,836	185,291	32.1
Total ...	...	...	77,823	143,519	221,342	33.7

Each Employment Exchange furnished returns setting forth the number of books exchanged in respect of the selected industries (men and women separately) classified as per the place of origin. The place of origin, for the purpose of this return, was regarded as being either (1) the local Exchange area, (2) one of the other eleven specified areas, (3) all other Exchange areas within the Survey Area, (4) all Exchange areas outside the Survey Area. A book exchanged in an area other than that in which it originated is called a "foreign" book and the proportion of such books exchanged in a given area can be of useful service in indicating the volume and direction of labour movement within and into that area. There are, therefore, two kinds of "foreign" books, viz., "local foreign", where the place of origin was within the Survey Area, and "non-local foreign", where the place of origin was outside the Survey Area. In interpreting any figures based on this analysis it must be borne in mind that the changes recorded are only approximately true in so far as:—

(1) The date of transfer may have been at any time between 1920 and 1931 or even since 1911 (in the four industries to which Unemployment Insurance was first applied) but cases of the latter will now be rare.

(2) The change may not have been direct. (i.e., a book originating in X and exchanged at Y may have gone to Z and from thence to A.B.C. and then to Y).

(3) Books exchanged in their area of origin may have changed their area and returned again, hence showing no change.

(4) In some cases firms keep all books at their head office and exchange them at the Employment Exchange nearest to that office. This would vitiate an attempt to trace the movement of such books, but it appears that "this is neither a frequent nor substantial element in the whole body of industrial procedure".* It is perhaps most true of railway workers'

* John Hilton, *Statistical Journal*, Vol. lxxxvi, p. 169.

books and therefore will not affect this return to any great degree, only perhaps in the case of the Road Transport workers to a small extent.

“ *Local Foreign Books* ” (i.e., *Movement originating within the Survey Area*).—Men.

53. *All Industries*.—The percentage of all “ local foreign ” books to the total exchanged is 21.2 for the whole Area, which *prima facie* shows a high degree of mobility. It is clear, however, that there are areas where excellent travelling facilities are available and where several of the specified Exchanges are in close proximity to one another. Such movement is of little significance in considering the question of mobility and a correction is therefore necessary. A correction has been made by grouping the following areas (1) Newcastle, Heaton, Walker, Elswick, South Shields, Wallsend, Gateshead; (2) Bishop Auckland, Consett; (3) Stockton, Middlesbrough, (4) Ashington, Blyth. If this correction is applied, the percentage of 21.2 falls to 14.8 (Table V App.). An analysis of the “ lodged books ” (i.e., those books belonging to the unemployed) gives the percentage of “ local foreign ” books before and after correction by grouping as 15.7 and 10.4. An analysis of the books not lodged (i.e., the books of the employed) gives the percentage of “ local foreign ” books before and after grouping as 24.5 and 17.5.

54. At this stage it will be appreciated that owing to the many qualifications arising from the peculiarities of the separate Exchange areas and industries contained in this analysis, only a general indication of labour movement is possible. For these reasons it is only possible to specify an upper and lower limit to the percentages of foreign books exchanged to the totals exchanged rather than to stipulate a single percentage and hence give a single index of mobility. This is unfortunately inevitable as no information is available regarding the large number of books originating in the unspecified Exchange areas within the Survey Area as to the proportion in close proximity to the area of the Exchange in which the books were exchanged. Therefore the correction applied by the grouping mentioned above cannot be applied to these books comprising 11 per cent. of the total books exchanged.

55. Now, in so far as a worker tends to lodge his book at his home Exchange (except, perhaps, in the case of seamen who sign the Unemployment Insurance Register at the Exchange nearest the port of signing) any movement of such books will represent changes of a permanent nature and a valid assumption can be made that in the case of “ lodged ” books a correction for contiguity (i.e., for movement within the immediate vicinity) will be quite effective since the tendency is to travel over short distances rather than permanently to change one’s home surroundings. It is then suggested that a fair lower limit to the index of mobility for all the industries in this sample (as shown by the percentages of “ local foreign ” books exchanged to the total books exchanged) is the

percentages of such books that were *lodged* at the various Exchanges after correction for movement within the immediate vicinity, namely 10.4 per cent. In the case of the books not lodged, the assumption of a permanent change cannot be made, for many workers' books are exchanged at the Exchange nearest to the works to which they may be travelling. Hence the books originating within the unspecified areas may contain quite a number which ought to be corrected for contiguity. The full force of this error can be checked, however, by grouping these books with the lodged books (i.e., considering the totals of books whether lodged or not) and it is suggested that the percentage of "local foreign" books (lodged and not lodged) to the total books exchanged after correction for contiguity furnishes a fair upper limit to the index of mobility, namely 14.8 per cent. The lower limit of 10.4 per cent. varies from 4.2 per cent. (Darlington) to 32.1 per cent. (Bishop Auckland). The former, an engineering centre, is notoriously self-contained and, moreover, fairly distant from the chief areas of production (except Tees-side), whilst the latter, a mining centre, lends itself open to changes of a permanent nature. Apart from these explainable limits, three other percentages not approximating to the average are due to the influence of coal mining where one naturally expects to see a strong bias towards changes of a permanent nature (e.g., colliery houses provided, difficulty of travelling owing to inconvenient hours). The upper limit of 14.8 per cent. varies from 6.6 per cent. (Darlington) to 33.5 per cent. (Consett). The former's peculiarity has been noted besides which the low percentage of engineering foreign books has had a big effect on the average percentage for all industries in Darlington. Consett's high figure is, without doubt, due to the exceptionally large proportion of books from unspecified areas, occasioned by the necessity of estimating such books. Bishop Auckland has a much higher percentage than the average, due to the influence mentioned above, and the remaining high figure (Stockton) is due to the large number of men attracted by the chemical industry in that area. Considering all the ten industries, the average percentage of "local foreign" books to the total books exchanged for male workers therefore lies between 10.4-14.8 per cent.

56. The following points are to be noted :—

(1) The correction for movement within the immediate vicinity accounts for approximately $33\frac{1}{2}$ per cent. of the total labour movement.

(2) The difference between the lower and upper limits being the difference between labour movement of a permanent character and movement of a permanent *and* temporary character would seem to show that of the labour movement beyond the immediate vicinity, two-thirds is of a permanent nature.

(3) In other words, four-ninths of the total labour movement within the Survey Area, as shown in the sample, is of a permanent nature beyond the immediate vicinity, and two-ninths of a temporary nature (i.e. by travelling), whilst one-third is movement within the immediate vicinity.

(4) These facts are singularly true of all the industries analysed (male and female workers) with only slight variations.

Taking the Exchanges representative of the three principal riversides within the Survey Area, the following are the percentages of "local foreign" books to the totals exchanged.

		<i>Lower Limit.</i>	<i>Upper Limit.</i>
Tyneside	... ..	9·7	13·3
Tees-side	... ..	7·8	14·9
Wearside	... ..	7·1	11·9

Tyneside accounts for 44 per cent. of the total books exchanged which explains its close approximation to the average range. Tees-side accounts for 19 per cent. of the total and is adversely affected by the small movement of the Pig Iron and Steel Workers (33½ per cent. of the total books for that area) not felt by the other two areas. Wearside appears to have been relatively less attractive than the other two areas but the difference in the average ranges is due to the low percentage of "local foreign" books in the Shipbuilding and Repairing industry, a correspondingly low percentage for Dock Labour and a smaller percentage of movement in the Distributive Trades. Taking the three areas industry by industry there is little difference in attractiveness, Wearside being undoubtedly third and Tees-side only slightly better than Tyneside. It is not possible to estimate the total flow of books from one of these three areas to the other two on account of the "unspecified areas" total but if the Exchanges specified are grouped and regarded as representative of the riversides it is seen that the greatest flow is between Tyne and Wear, a slightly lesser flow between Tyne and Tees and a small flow between Tees and Wear, thus:—

(1)	Flow from Tyne to Wear	... ..	597
	" " Wear to Tyne	... ..	602
(2)	" " Tyne to Tees	... ..	812
	" " Tees to Tyne	... ..	259
(3)	" " Wear to Tees	... ..	149
	" " Tees to Wear	... ..	65

These books, even allowing for a generous proportion of books from the unspecified areas, only represent a very small proportion of the total "local foreign" books received by the three riversides and it therefore seems that a great deal of the labour movement beyond the immediate vicinity nevertheless is closely related to its local riverside. This deduction is supported by the fact that both the Tees-side and Tyneside Labour Clearing Houses experience no difficulty in filling vacancies for skilled and unskilled workers in the areas under the Clearing Houses.

57. *Coal Mining*.—47,655 books were exchanged, being 23 per cent. of the total insured in the industry. The percentage of all "local foreign" books to the total exchanged is 24.9 and after correction for changes within the immediate vicinity, 22.2 per cent. For lodged books the figures are respectively 27.1 per cent. and 25 per cent. and for all the other books 24 per cent. and 21.1 per cent. These corrected percentages are undoubtedly too high as, unfortunately, almost the entire number of "local foreign" books originated in the unspecified areas. What proportion of these books should be corrected for contiguity cannot be estimated as although it is well known that the hours of work in the mines do not lend themselves to systematic daily travelling and that colliery houses are provided, it is undeniably true that many miners tramp enormous distances at all hours to follow their calling, besides which there has been a large increase in the use of road transport as a method of conveyance. *Prima facie* the upper and lower limits are, according to the reasoning in the previous section, 25.0 per cent. and 22.2 per cent., the bias being towards changes of a permanent nature. This bias is most marked but the real extent is naturally hidden because of the great unknown quantity previously mentioned. Similarly the difference between the corrected and uncorrected percentages, small as it is, does not necessarily show that the movement is almost entirely beyond the immediate vicinity. Further, an examination of the actual figures shows a great and varied range of percentages.

58. The following generalization can be made :—

In the *Economic Journal* for June, 1931, Mr. Brinley Thomas of the London School of Economics, in an analysis of labour mobility in the South Wales and Monmouthshire coal mining industry, found that, without allowing for movement within any one valley (i.e. without any correction for contiguity) the average percentage of "local foreign" books to the total exchanged (225,012) was 15.2. In the present analysis the corresponding figure is 24.9 per cent.

It appears, therefore, that the mobility of labour in the coal mining industry in the Survey Area is not less than that shown by Mr. Thomas to exist in South Wales and Monmouthshire. This view is supported by the known cases of miners tramping great distances to their mines, by the excellent road transport facilities in the Area, by the large number of men transferred under the Transfer Scheme, and by the extent of the movement from outside the immediate vicinity into individual Exchange areas, where a fair correction for contiguity *can* be assumed to have been made. This is gratifying when one considers the natural disinclination on the part of the miner to leave his native district. In this connection the following interesting statement was made by the Secretary of the Tees-side Labour Clearing House :—

" An anhydrite mine was opened at Billingham by the Synthetic Ammonia and Nitrates Ltd. As anhydrite is a kind of stone never previously dealt with in this Area, it was first thought that experienced stone miners would be most suitable. Large numbers of ironstone miners were imported from the Cleveland district, but were found to be less successful than anticipated. It was decided to try coal miners and consequently numbers were imported from the Durham and Northumberland coalfields. These coal miners proved to be much more adaptable and their services were retained."

These men were easily found and in accepting the work they changed their occupation and industry.

Within this degree of probability the corrected percentage of " local foreign " books to the total exchanged will not therefore be less than the percentage for South Wales and Monmouthshire as set out by Mr. Thomas, namely 6.6 per cent. This percentage is much lower than the average but is to be expected, as the surplus labour available in any one vicinity has been for some time more than sufficient for any requirements; but even so, it effectually disposes of the prevalent idea that such type of labour is highly immobile.

59. *Shipbuilding and Repairing*.—25,596 books were analysed, being 47 per cent. of the total insured in the industry. The percentage of all " local foreign " books to the total exchanged before allowing for contiguity is 23.0 per cent., and after allowance 10.0 per cent. For the lodged books the figures are respectively 15.8 per cent. and 7.0 per cent. and for all the other books 41.2 per cent. and 17.6 per cent. The lower and upper limits are therefore 7.0 per cent.-10.0 per cent. This upper limit is considerably less than the corrected percentage for books not lodged (17.6 per cent.) but it is, no doubt, a fair limit as the latter percentage is based on books comprising 14 per cent. from unspecified areas a considerable number of which will not have gone beyond the immediate vicinity.

The three chief riversides have the following ranges :—

Tyneside	...	...	...	...	8.9—11.9 per cent.
Tees-side	...	...	...	...	10.5—15.5 "
Wearside	...	...	...	...	3.3—4.2 "

Tyneside accounts for more than 50 per cent. of the total books analysed, which accounts for its close approximation to the average range. Tees-side accounts for 15 per cent. and the Wear for 25 per cent. of the total. Blyth only accounts for 4.0 per cent. of the total books and has an extremely low range of 2.9-3.1 per cent.

60. Comparison with the average range percentage of " local foreign " books for all industries shows that the shipyard worker is not so mobile as the average. Further, the great difference

between the corrected and uncorrected figures shew that considerably less than one-half the total movement is beyond the immediate vicinity. The great amount of movement within any one ship-building centre contrasts with the little movement from centre to centre; thus, considering the specified Exchanges only, the movement from Tyne to Tees consists of 64 books and from Tyne to Wear 67, a very small number indeed. It cannot be said that the shipyard worker is not willing to move from centre to centre because of this relatively low range percentage. Movements from centre to centre are undoubtedly hindered by the fact that each centre has an abundant supply of local labour, besides which the "market" system for casual labour renders daily travelling from Tyne to Wear, etc., well-nigh impossible. It is only at great inconvenience that the shipyard labourer seeks employment at a yard beyond his home but within a particular centre. Given employment, however, one cannot say that a shipyard labourer would not move from one centre to another, either by travelling daily or by a permanent change. Perhaps the casual nature of his work might deter him from permanently changing his home surroundings, whilst on the other hand, the same factor might well render the home ties not so strong as those of a man in regular employment. The numerous transfers of such workers beyond the Survey Area point to the fact that the shipyard labourer is not necessarily less mobile than other workers; he is undoubtedly inclined to seek employment at his own "market" knowing full well that other markets have their "preference men", but this does not say that he is not inclined to go beyond should work be found for him. The same is true of the skilled workers but in addition it is known that such men when unemployed frequently accept or obtain unskilled or semi-skilled jobs rather than leave the locality in which they were employed at their trade (e.g. platers). Through the machinery of the Tyneside Clearing House, 288 men drawn mainly from Tyneside were transferred during 1930 to Dundee, Glasgow, Falmouth, Devonport, Barrow, Southampton, etc.

61. *Building*.—17,556 books were analysed, being 59 per cent. of the total insured in the industry. The percentage of all "local foreign" books to the total exchanged is 22.9 per cent. before correction for contiguity and 15.5 per cent. after correction. The corresponding percentages for the lodged books are 17.2 per cent. and 12.5 per cent., and for all the other books 25.4 per cent. and 16.8 per cent. The lower and upper limits are therefore 12.4 per cent.—15.5 per cent. The number of books from the unspecified areas is relatively small and will not materially affect the range. All the various areas approximate markedly to the two limits, the three riversides being as follows:—

Tyneside	...	...	...	...	12.0—15.3 per cent.
Tees-side	...	...	...	...	12.1—16.1
Wearside	...	...	...	...	9.3—13.6 ..

Building not being typical of any one centre or area it is to be expected that what movement there is is true, more or less, of all the areas within the Survey Area, no area standing out boldly as a centre of attraction. A bias in favour of Tees-side is to be expected—the slightness is unquestionably due to the fact that there has been a fair amount of local labour available, the foreign books belonging most probably to skilled men. The lower limit is quite a fair amount higher than the average and much higher than that for any other industry in this analysis, which undoubtedly shows that the labour in this industry is highly mobile within the Survey Area.

62. *Chemicals*.—8,635 books were analysed (52 per cent. of the total insured in the industry). The proportion of all "local foreign" books to the total exchanged is, before correction for contiguity, 39.1 per cent., and after correction 20.6 per cent. For the lodged books the respective proportions are 16.8 per cent. and 9.3 per cent., and for the other books 48.8 per cent. and 25.5 per cent. The lower and upper limits are therefore 9.3 per cent.—20.6 per cent. The upper limit is much less than that for the books not lodged, but the latter included a good number of books from the unspecified areas and the percentage of 20.6 is much fairer. (In correcting for contiguity in this industry, Darlington was grouped with Stockton and Middlesbrough on account of the exceptionally large proportion of books (not lodged) from that area.) 85 per cent. of the books were exchanged on Tees-side and 12 per cent. on Tyne-side, the respective ranges being :—

Tees-side	...	...	...	...	10.0—22.3 per cent.
Tyneside	...	...	...	...	3.8—8.4 „

It is clear that the movement shown is entirely in one direction, namely, the comparatively new chemical area of Tees-side. Further, the actual figures show that Tyneside has supplied a very great part of the labour, whilst the difference between the upper and lower limits would appear to point out that the greater part of the movement is not of a permanent nature. The great difference between the uncorrected and corrected percentages is no doubt due to the fact that there is an ample supply of available labour within the immediate vicinity, whilst the high upper limit shows with what eagerness labour is willing to move within the Survey Area if a new industry is commenced. It will be noticed that the lower limit is lower than the average and when contrasted with the high upper limit one is left wondering whether this strong bias towards temporary changes is because the labour concerned regards such employment only as a temporary expedient, or whether it is purely a question of accommodation.

63. *General Engineering*.—22,162 books were analysed (or 71 per cent. of the total insured in the industry). The percentages of "local foreign" books to the totals exchanged are as follows :—

All books—before correction for contiguity	...	12.8 per cent.
and after correction	... ..	6.6 " "
Lodged books—before correction for contiguity	...	9.4 " "
and after correction	... ..	3.9 " "
Other books—before correction for contiguity	...	15.7 " "
and after correction	... ..	9.0 " "

The lower and upper limits are therefore 3.9 per cent.—6.6 per cent. (An examination of the numbers of books from unspecified areas would seem to justify the percentage of 6.6 as against 9.0 as the proportion of such books (not lodged) to the total exchanged is 8.0 per cent.) These percentages are the lowest recorded in any of the industries sampled, and it is clear from the actual figures that little movement has taken place in this industry. The only area of any importance having a fairly high range is Gateshead (8.2 per cent.—14.2 per cent.), but the number of books from unspecified areas comprises 15 per cent. of the total exchanged, the greater portion of which will undoubtedly be from the immediate vicinity—thus the range for Tyneside approximates closely to the average, namely, 5.0 per cent.—8.6 per cent. On the other hand, Darlington, a typical engineering centre, shows the exceedingly low range of 1.0 per cent.—2.5 per cent. Even if all movement is accounted for (i.e. movement within and beyond the immediate vicinity) the resultant percentages are the second lowest in this analysis (lowest—Pig Iron and Steel), being a little more than one-half the uncorrected percentages for "all industries". Undoubtedly the low percentages so far as they relate to movement beyond any one area are due largely to the general depression. The engineering centres are few and fairly distant from one another, each having a surplus labour supply, thereby negating any tendency to move beyond a centre. In addition there is the fact that a skilled worker having served five years' apprenticeship has a strong attraction for his "shop". On the other hand, Darlington has not fared so badly as other centres in the general depression, and one might have expected to find a greater proportion of "local foreign" books, though it is not amenable to changes of a temporary nature (e.g. travelling) so far as the Wear and Tyne centres are concerned. It would seem that the men have relied on their own particular shop, and whilst not entirely immobile, are nevertheless considerably below the average.

64. *Pig Iron and Steel Manufacture.*—16,389 books were analysed (or 46 per cent. of the total insured in the industry). The percentages of the "local foreign" books to the totals exchanged are as follows:—

All books—before correction for contiguity	...	12.0 per cent.
and after correction	... ..	8.0 " "
Lodged books—before correction for contiguity	...	9.9 " "
and after correction	... ..	6.1 " "
Other books—before correction for contiguity	...	13.2 " "
and after correction	... ..	9.2 " "

The lower and upper limits are therefore 6.1 per cent.—8.0 per cent. The upper limit is greatly influenced by the small areas comprising 25 per cent. of the total books analysed, Tees-side accounting for 75 per cent. of the books, having a range of 6.2 per cent.—6.6 per cent. Even with the upper limit placed at 8.0 per cent. this is the second lowest range recorded (the lowest being General Engineering) and, so far as the uncorrected figures are concerned, the lowest range recorded (second lowest being General Engineering). It is not surprising to find this low index of mobility in close harmony with that for General Engineering, and it would seem to show that the factor common to both industries is the great available surplus supply of local labour which has rendered movement from centre to centre wellnigh unproductive, whilst the relatively large proportion of temporary stoppages attached to these two industries may also be a contributory cause.

65. *Distributive Trades.*—23,569 books were analysed representing 29 per cent. of the total insured in the industry. The percentages of "local foreign" books to the totals exchanged are:—

All books—before correction for contiguity	...	17.3 per cent.
and after correction	... ..	11.6 " "
Lodged books—before correction for contiguity...	...	11.6 " "
and after correction	... ..	7.0 " "
Other books—before correction for contiguity	... ..	18.8 " "
and after correction	... ..	12.8 " "

The lower and upper limits are therefore 7.0 per cent.—11.6 per cent. The actual range varies from 2.8 per cent.—5.5 per cent. (Gateshead) to 19.0 per cent.—32.0 per cent. (Wallsend), but both these extremes are lost in the grouped range for Tyneside. The limits for the three riverside areas are as follows:—

Tyneside	6.2—9.0 per cent. (comprising 57 per cent. of the total books analysed).
Tees-side	9.2—20.8 " " (" 16 " " " " " ").
Wearside	6.0—12.0 " " (" 11 " " " " " ").

The remaining areas have relatively high ranges but they are based on small numbers. Tees-side has very definitely been a centre of attraction due to the comparatively recent increase in activity arising from the working of the chemical industry in that area. An examination of the actual numbers reveals that, so far as the specified areas are concerned, Tees-side and Wearside received an equal number of books from Tyneside; Wearside received a much greater number from Tyneside than from Tees-side, and Tees-side a much greater number from Tyneside than Wearside. The index is poorer than the average for all industries both for movement within and beyond the immediate vicinity, which may be caused by the proportion of young persons employed in the industry, besides which the numbers employed remain fairly steady and openings are now few.

66. *Trams, Omnibus, Road Transport.*—11,463 books were analysed (or 72 per cent. of the total insured in the industry).

The percentages of " local foreign " books to the totals exchanged are :—

All books—before correction for contiguity	19.4 per cent.
and after correction	12.8 "
Lodged books—before correction for contiguity	14.8 "
and after correction	9.8 "
Other books—before correction for contiguity	24.4 "
and after correction	16.1 "

The lower and upper limits are therefore 9.8 per cent.—12.8 per cent. The ranges for the three riverside areas are as follows :—

Tyneside	9.1-12.4 per cent. (comprising 64 per cent. of the total books analysed).
Tees-side	7.1-11.1 " (" 8 " " " " " " ")
Wearside	11.0-12.4 " (" 19 " " " " " " ")

The other areas approximate to the average range. The lower limit is the highest recorded and it is clear that the comparatively recent increase in the use of road transport has attracted labour from all over the Survey Area. Besides this factor there is the fact that easy travelling facilities are provided for the workers in the industry. On the other hand, the percentages are likely to be swollen in respect of those books not lodged in so far as there are a number of firms who will have exchanged the books of the workers at the Exchange nearest the head office. This fact accounted for will tend slightly to decrease the upper limit, and hence an extremely high proportion of the movement is of a permanent nature.

67. *Canals, Rivers, Docks, etc.*—8,386 books were analysed (representing 64 per cent. of the total insured in the industry). The percentage of " local foreign " books to the totals exchanged are as follows :—

All books—before correction for contiguity	27.7 per cent.
and after correction	21.7 "
Lodged books—before correction for contiguity	7.5 "
and after correction	5.9 "
Other books—before correction for contiguity	42.7 "
and after correction	33.2 "

The percentage figure of 21.7 is undoubtedly far too high as almost 25 per cent. of the total books analysed originated in the unspecified areas; it is obvious that the lodged books representing less than 50 per cent. of the total books exchanged do not counteract the error in the greater part of the books analysed. This error is particularly noted in the case of the Tyneside areas with a range of 9.1-32.0 per cent. (having 33½ per cent. of its total originating in unspecified areas) whereas Tees-side and Wear-side (both having less than 10 per cent. of the totals analysed, originating in unspecified areas) show ranges of 3.4-6.0 per cent. and 3.9-9.9 per cent., and these ranges cover 43 per cent. of the total books analysed. If therefore the percentage of books from unspecified areas in the case of Tyneside is reduced to 6.0 of the total exchanged, a fairly low figure, the upper limits of 21.7 per cent. and 33.2 per cent. fall to 13.1 per cent. and 18.6 per cent. Tyneside's range becomes 9.1 per cent.—18.5 per cent. It can

therefore be stated that the range proportion of "local foreign" books to the total exchanged is 5.9 per cent.—13.1 per cent. This range is somewhat lower than that for all industries but, bearing in mind the casual nature of such work, the mobility shown is undoubtedly quite good and is in keeping with the fact that this particular group is a bright spot in a more or less depressing picture of the characteristic industries of the North East Coast. It can be seen from a comparison of the uncorrected percentages that there is considerable movement within the immediate vicinity although permanent changes within the immediate vicinity are extremely few.

68. *Printing, etc.*—3,425 books were analysed (representing 51 per cent. of the total insured in the industry). The percentages of "local foreign" books to the totals exchanged are as follows:—

All books—before correction for contiguity	...	17.5 per cent.
and after correction	... ..	10.8 "
Lodged books—before correction for contiguity	... ..	16.3 "
and after correction	... ..	7.7 "
Other books—before correction for contiguity	... ..	17.7 "
and after correction	... ..	11.5 "

The range is therefore 7.7 per cent. to 10.8 per cent. The numbers are small and the percentages of "local foreign" books naturally most varied. Tyneside (accounting for 65 per cent. of the total books analysed) has a range of 5.9 per cent.—9.4 per cent., Tees-side (10 per cent. of the total books analysed) has a range of 9.6 per cent.—10.7 per cent., and Wearside (7 per cent. of the total books analysed) a range of 21.0 per cent.—22.9 per cent. The percentage range is lower than the average for all industries, but on the whole this is not surprising as there is normally little demand for male workers. So far as the small numbers originating in the specified areas are concerned, the Wear received all its "local foreign" books from Tyneside and the latter received the greater part of its "local foreign" books from the Wear; the Tees received more books from the Tyne than the Wear and the few cases of movement beyond went to Tyneside.

69. *Local Foreign Books—Women.*—36,051 books were analysed being 43.5 per cent. of the total female insured population (18—64) of the Survey area. The industries analysed were as follows:—

Distributive Trades	... ..	23,532
Printing	... ..	1,437
Hotel, Boarding House, etc.	... ..	6,220
Tailoring	... ..	1,803
Bread, Biscuit and Cake	... ..	1,178
Food	... ..	802
All Industries	... ..	36,051*

* *Note.*—The discrepancy is due to the fact that certain Exchanges rendered returns for the same industries as the men, hence a considerable number had to be ignored.

The proportion of "local foreign" books to the total exchanged for all industries is 13.3 per cent. and after correcting for movement within the immediate vicinity, 7.2 per cent. The respective proportions for the lodged books are 10 per cent. and 5 per cent. and for the books not lodged 14.1 per cent. and 7.8 per cent. Only 5 per cent. of the total books exchanged originated in the unspecified areas hence the lower and upper limits can be quite well placed at 5 per cent.—7.2 per cent. Both these limits are half the corresponding limits for the male workers and even allowing for movement within the immediate vicinity the amount of such movement is only a little more than one-half that of the male workers. Compared with the male workers, there is a smaller proportion of the movement beyond the immediate vicinity, a little over one-half of the total movement being beyond the immediate vicinity as against two-thirds in the case of the male workers. As in the case of the male workers, two-thirds of the movement beyond the immediate vicinity is of a permanent nature. This fact is true of the workers in the Distributive Trades (comprising 65 per cent. of the total books analysed), but in the case of Printing, Hotel, etc., and Tailoring, the proportion is a little over one-half, whilst for Food, it is less than one-third, but for Bread, etc., it is almost 100 per cent.

The ranges for the riversides are as follows:—

Tyneside	3·7-6·4	per cent. (comprising 59·0 per cent. of the total books analysed).
Tees-side	6·6-9·2	" (" 17·5 " " " " ")
Wearside	6·1-7·0	" (" 13·3 " " " " ")

If the specified areas are grouped to represent the riversides it is seen that, similar to the male workers, the greatest flow is between Tyne and Wear, a much less flow between the Tees and Tyne, and a small flow between Tees and Wear, thus:—

(1) Flow from Tyne to Wear	...	...	...	...	180
" " Wear " Tyne	...	...	...	...	183
(2) Flow from Tyne to Tees	...	...	...	...	126
" " Tees " Tyne	...	...	...	...	18
(3) Flow from Wear to Tees	...	...	...	...	23
" " Tees " Wear	...	...	...	...	15

70. It is interesting to note that this flow represents a much higher proportion of the total "local foreign" books received by the three riversides than in the case of the men; the proportion is twice as high as that for the male workers although it must be realised that the latter suffered adversely from the relatively high proportion of books excluded by reason of their originating in unspecified areas, besides which a much greater proportion of the flow above is between Tyne and Wear than in the case of the male workers. The following are the range percentages of local foreign books:—

	<i>Including movement within immediate vicinity. per cent.</i>	<i>Excluding movement within immediate vicinity. per cent.</i>
1. Distributive Trades	8.7—11.7	4.3—6.6
2. Printing	12.7—15.7	3.1—6.0
3. Hotel, Boarding House, etc.	11.9—20.3	7.2—12.1
4. Tailoring	12.7—14.4	3.4—6.6
5. Bread, Biscuit, Cake	11.8—14.0	6.3—6.8
6. Food	7.2—13.4	1.1—3.6

In the case of Distributive Trades and Printing, comprising 70 per cent. of the total books analysed, all areas approximate to the average ranges except where the numbers are small. (3) and (5) ranges are adversely affected by the small percentages of Tyne-side whilst (4) and (6) are helped by the relatively high percentages of Tyneside.

71. "Non-Local" Foreign Books. (*Movement into the Survey Area*).—The number of books originating outside the Survey Area totalled to 8,924 (men) and 1,016 (women) a grand total of 9,940. The proportion of such books to the total exchanged is 4.8 per cent. (men) and 2.8 per cent. (women). The proportions for the lodged books are 5.5 per cent. and 6.1 per cent. and for books not lodged 4.4 per cent. and 2 per cent. It must be remembered that the changes shown may have taken place before 1921. Taking all industries (men) together, the greatest actual numbers of such books was received by Tyneside (3,912), the next being Tees-side (2,208) and thirdly, Wearside (1,177); the percentages being 4.8, 6.3 and 5.2 respectively. There is therefore little difference in the relative attractiveness of the three centres and this is true of all the industries analysed except Chemicals and Printing where Tees-side has a percentage more than twice the other centres and Coal Mining where Wearside's percentage is three times as high as Tyne-side's. In the case of women, Tyneside received 442 books, Tees-side 306, and Wearside 154, the respective percentages being 2, 4.9 and 3.2. The respective percentages for the industries analysed are varied being based on small numbers but on the whole the same order is true. That there has been no marked difference in the attractiveness of these three centres is seen by the proportions of "lodged books" received from outside the Survey Area namely, men, 6 per cent., 5.8 per cent., 5.2 per cent.; women, 4.6 per cent., 11.2 per cent., 7.4 per cent. Comparison of "local" and "non-local" foreign books (lodged) shows that the order of attractiveness of the three riverside areas is the same in both cases for men and women, and further, that the order of attractiveness of the various industries is followed closely in both cases.

72. *Movement beyond the Survey Area*.—Owing to inability to measure statistically such movement it is only possible to make general observations in this section. It is significant, however, that

between 1926 and 1929 there was an approximate decrease in population due to migration of 38,474 for Tyneside, and 84,522 for Durham County. Accommodation difficulties are great and it appears that most of the workers leaving the Survey Area are single persons. This was true in the case of 1,400 men transferred mainly to the South in 1929 by the Tyneside Clearing House (following the Prime Minister's Appeal of 1928), and of 1,302 in 1930. Until the Spring of 1930 numerous transfers were made by the Clearing House to far distant shipbuilding and repairing centres, 1,190 ship-repairing workers being so transferred in 1929. During 1930 the same Clearing House transferred 1,305 men to London, the greater part consisting of navvies and general labourers (1,012) although 121 building workers and 105 barmen and hotel workers were also transferred. To far distant shipbuilding and repairing centres 288 men were transferred in the same year. It has been pointed out by the Clearing House that "there is a real keenness on the part of men out-of-work to grasp almost any opportunity of securing a job and there is ample evidence of this in the fact that almost all the vacancies referred to above were filled within 24 hours of notification. The men commenced work or actually travelled to distant areas on the morning following that on which they heard of the job, this sometimes involving travelling long distances minus articles of clothing in the wash or cast-off for urgent repairs in order to maintain self-respect amongst strangers". The truth of this statement is not doubted but it only applies to what is, after all, a very small proportion of the surplus labour in the Survey Area. At the present time little transference is taking place and there is undoubtedly a drift back which is by no means negligible. It has to be remembered, however, that there are the strong sense of ties of home and locality, the physical difficulties in the way of absorption from one industry to another, the lack of means, the cost of removal of furniture and family, etc., and unemployment in other areas; all difficulties in the way of transfer. Undoubtedly, a fair amount of labour transference is taking place automatically as is evident from the number of claims for benefit transferred from one Employment Exchange to another, but to a large extent this movement is misdirected and in many instances results either in a worsening of the position in already overcrowded areas, or in a very real hardship and disappointment to the adventurer. Some of the difficulties experienced in filling vacancies beyond the Survey Area are worthy of note:—

(1) A firm on the South Coast nominated a number of men (skilled), residing on Tyneside, whom they were prepared to engage for a period of eight weeks provided they paid their own railway fare both ways. Eleven of the men refused the offer, for the reason that they had been previously employed by the firm's Tyneside branch in manufacturing the articles they were required to erect elsewhere and claimed they were entitled to an allowance above the standard rate of pay; there was a signed agreement between the men's

Trade Union and the employers referred to for travelling and subsistence allowances to be paid to such employees required to undertake jobs for the firm away from Tyneside.

(2) Seven good type labourers were required for work in Shropshire at a rate of pay lower than the usual and there was consequently little enthusiasm to accept the offer but the vacancies were successfully filled by men from Jarrow and Pallion.

(3) There is a difficulty of transferring coal getters to the Canterbury district on account of the unaccustomed heavy air pressure of a pit 3,000 feet deep, besides which the miners from the North are antagonistic to the "Butty" system of payment which applies to that area.

Summary.

73. It remains only to be stated that in view of the general depression within the Survey Area, the extent of the labour movement shown both within the Survey Area and beyond in this analysis can well be regarded as a sign that the problem of territorial mobility is not unduly great on the North East Coast; an assumption well exemplified by the percentage of vacancies cancelled to the total notified in the North East Area (Employment Exchanges) as compared with the similar proportion for Great Britain as a whole, namely, 3.59 per cent. and 4.65 per cent. (for the half year ended 6th July, 1931). For the Tyne, Tees and Wear areas the respective percentage was as low as 2.04 for the same period, mainly due to vacancies withdrawn by employers for such reasons as over-estimation of the number required and satisfaction of demands by chance callers at the employer's works. With the exception of the Chemical Industry it is clear that the movement shown is the result of individual forces, and to this extent the mobility could be enhanced were these forces organized. In this connection the two Labour Clearing Houses in the Area are undoubtedly additive so far as movement within the immediate vicinity is concerned.

No doubt the presence of a local surplus supply of labour characteristic of every area within the Survey Area explains the small amount of movement beyond the immediate vicinity of any one area, a great deal of which must, in any case, have taken place before 1929. The lack of stimulus in this movement is true not only for the separate industries analysed, whether basic or otherwise, but also for the individual areas sampled, with the exception of the area around Newcastle. The localized nature of the Survey Area's industrial life seems to have robbed the workers of that stimulus existing in areas having a varied industrial life and to have stabilised mobility throughout the Area as a whole.

2. Occupational Mobility.

74. Following the analysis of territorial mobility made in the preceding Paragraphs 51 to 73 inclusive, the Employment Exchanges who supplied the data for that investigation were asked to

analyse the U.I. 40 cards received by them during the month of October, 1931. These cards are given in by workers who have been on the Live Register (unemployed) and have secured employment, in acknowledgment of the receipt of the Unemployment books. On them appears information as to the industry and occupation in which they were last employed and the industry and occupation in which they have now found employment. Thus the survey showed exactly the movement of all the insured workers who had been registered as unemployed at these Exchanges and had secured work during the month. The following Paragraphs 75 to 78 inclusive, for which again Mr. Ernest Davison is responsible, analyse the results of this survey. Unfortunately, complete statistical analysis of the returns received was not possible owing to the lack of time, but the principal facts arising from a general review of the material collected are given.

75. The total number of U.I. 40 cards received by the Employment Exchanges from men removing their Unemployment books on taking up work, was 17,863, or 2.9 per cent. of the total insured male workers (18—64) on the North East Coast. Of these, 13,838, or 77 per cent. started work at their old occupations and in their old industry; 1,044, or 6 per cent., kept the same occupation but changed their industry; 559, or 3.0 per cent. changed their occupation but remained in their old industry; and 2,442, or 14 per cent. changed both occupation and industry—a large number of these going to relief work.

76. A close though not exact survey of the returns showed that movement from occupation to occupation is on the average less than from industry to industry. Many changes of industry alone were made by semi-skilled and unskilled workers. There were, however, a similar number of changes of industry among skilled workers and it would seem that, given the opportunity there would be a steady movement of certain workers from industry to industry; thus it was noted that a considerable number of bricklayers changed from Furnacework to Building; plumbers, painters and joiners moved from Shipbuilding to Building (though there was little or no movement from Building to Shipbuilding); many engineering workers moved within the engineering group of industries but none appeared to go outside this group, except a few maintenance men (e.g., joiners), who moved from Engineering to Building; and similarly in the case of Chemicals.

77. As regards change of occupation in the same industry the changes made were mostly cases of skilled workers taking unskilled work. This may probably be regarded as only a temporary change under stress of a high degree of unemployment in their own occupation. In the fourth group, change of both occupation and industry, the high number is clearly due to relief work involving

entry into Public Contracting of unemployed men from a great variety of classes (on the whole over 50 per cent. of this group were skilled workers).

78. If the returns can be regarded as a satisfactory sample of the workers on the North East Coast it is clear that—(1) any movement of labour among skilled workers is little due to changes of occupation either within or without an industry except to unskilled or semi-skilled work; (2) so far as unskilled or semi-skilled workers are concerned such workers freely change occupation and/or industry as occasion arises. Their opportunities are, of course, greater than is the case with skilled workers but the returns appear to show that, at least at present, their mobility is not so much greater than that of the skilled worker as is commonly believed; there is evidently active competition between the two types of labour; (3) the distribution of the workers as regards the above occupational movement is the same for the basic industries group as for the other industries in the sample, whilst only one area namely that around Newcastle shows a higher proportion of movement than the average. At the time this survey was made, however, the total demand for labour was far below normal and the opportunity for occupational or industrial change was correspondingly small. It may be assumed, therefore, that the general impression given by the returns analysed does not err on the side of exaggerating the possible mobility but rather the other way.

79. *Skilled Labour Mobility*.—The foregoing analysis of occupational and industrial mobility emphasises the relative rigidity of occupational mobility among skilled workers. So far as the re-organization of existing industries intended to make them more efficient competitors for home and foreign trade is concerned, any difficulty regarding mobility which may arise will be largely that of the lines of demarcation between the several skilled trades themselves and between these and other types of labour. For reasons already mentioned several times in this Memorandum, these lines are very deeply marked on the North East Coast. This is due to the comparative simplicity of industrial organization and a consequent high occupational specialization. Further, the characteristic industries of the Area are those which have inherited the old craft traditions which despite much-changed conditions have left their mark stamped on the Trade Unions of the engineering, shipbuilding, and building workers—the workers in metal and wood.

80. The problem of demarcation which arises where there is close similarity in the kind of work done by different classes of skilled labour is complicated, in addition to the factors mentioned above, by others which are at least as much social as economic. The various bodies of skilled workers, so long organized, have all along held rightly or wrongly to this rigid differentiation as one of their strongest defences against "exploitation" by their masters. This vested interest is also defended against other bodies of workers;

partly for the reason already given, and partly because the members of each craft wish to limit the supply of labour in their own particular occupation. It is therefore a prime concern of each Trade Union to defend the interest of its members not only against their employers but also against encroachment on their preserves by other groups of workers. In the main the difficulties of demarcation arise in the engineering and shipbuilding industries and between the different trades who work on the same material, e.g. fitters and plumbers; joiners and shipwrights. In these industries the old craft spirit has been invaded by the modern development of mechanization—the increasing differentiation of processes involving the division of work hitherto done by one skilled man into a variety of processes some of which do not require the skill which can only come from several years of training under the apprentice system. But along with this problem, which, while important on the North East Coast is not so serious a question as elsewhere, there is the more general tendency to the speeding up of production which induces impatience with delays due to the rigid allocation of similar kinds of work among different classes of workers. This problem, while present in the Survey Area, does not appear to us to be a very substantial one. The Trade Unions concerned have agreements with each other and with the Employers which at least prevent disputes from involving stoppages of work. The schedules of allocation of work to the particular classes of workers are so carefully drawn that it is only occasionally that any dispute arises. Where it does the agreements provide that the men actually engaged on the job will go on with it pending a settlement between the Unions involved. It is claimed by the Trade Unions that since the War no stoppage of work, on any but the most trivial scale, attributable to demarcation disputes, has occurred in the Area. While the Employers complain of the hindrance to the continuity of work which arises from the fact that the men to whom the work is allocated are not always immediately available, while other men could be going on with it, in all the circumstances we do not consider demarcation has been a serious factor affecting productivity in the industries concerned. So far as it is of importance its solution lies not in better machinery for settling disputes but in the general conditions which determine the relations between masters and men.

81. Another cause of friction in mobility is the so-called "market system" which affects all classes of labour but skilled labour more than the others (except in Dock Labour). By setting itself up as a single market for labour each works tends to swell the total reserve of labour, attaching to itself a number of men equal to its maximum demand. As the demands of all the various units are not correlated there will always be a larger reserve of labour than is necessary to supply the aggregate demand of the industry or

occupation in a given area, e.g. Tyneside. The Tyneside Social Research Committee under the able directorship of Dr. H. A. Mess has emphasised this point in the book "Industrial Tyneside" and suggested an organization of the whole area into single markets for labour for each industry. Attempts have been made to make such arrangements with regard to the industries most subject to fluctuations—Dock and Harbour Services and Shipbuilding and Ship-repairing—but so far they have been defeated by the desire of the individual employer to retain the men used to his particular type and method of production and by the interest of the workers in spreading employment over the available number of workers as far as possible. Undoubtedly any such scheme would increase redundancy in the first instance as it would provide more continuous full employment for a fewer number of men. In the long run, however, it would adjust the total demand and supply of labour much more closely than at present, through the increased mobility of the various classes of labour throughout each homogeneous area.

82. In the case of new industries the absence of occupational mobility among the skilled trades is not so big a problem. The newer industries do not employ large numbers of skilled men. So far as industries new to the Area did require skilled workers of a different type to those at present found in it, difficulties would arise if any attempt were made to reduce the redundancy of labour in the Area by employing either men of different trades or semi-skilled and unskilled men on the new work. So far, new industries would not tend to reduce the redundancy of labour on the North East Coast. But, as already stated, the demand of new industries would almost certainly be largely for labour other than the skilled craftsman, and among these there are no such rigid lines of demarcation.

Summary.

83. Apart from the special case of skilled labour the special investigations described and analysed in this part of our Memorandum indicate that the degree of territorial and occupational mobility is relatively high on the North East Coast. The statistical evidence of these investigations is supported by the opinions of employers, Trade Union officials and Employment Exchange officials alike. All agree that given an offer of work in which the conditions of wages, permanency, etc. can be reasonably held to justify removal from the Area to other parts of the country there is no difficulty in getting men of all occupations to do so. Occupational change is inevitably more difficult but under the same conditions as mentioned above semi-skilled and unskilled labour move as freely as could be expected from occupation to occupation and from industry to industry. There must always be friction in mobility. It is a question of degree and the evidence available shows that on the North East Coast friction is at least no greater than elsewhere.

It appears in fact to be rather less, due probably to the fluctuating character of its main industries even in normal times and also to the severe experiences of the past ten years. No doubt Unemployment Benefit which has enabled a relatively higher standard of life to be maintained during the present prolonged unemployment than at any previous period of depression has some influence in preventing mobility, but it appears to us that the evidence shows that it is quite unimportant. In any case it is unavoidable, as the only alternative, that of a lower standard, would have even more serious effects on the economic value of labour. Further, if our suggestion that the relative prosperity of the consumption industries and services on the North East Coast and in the country generally is due to a redistribution of wealth, of which Unemployment Benefit is a part, rather more in favour of the great mass of the working classes, then any reduction of the aggregate income of these classes would have a contrary effect on the services mentioned. This would have to be taken into account in the balance of advantages which would have to be made.

(v) Industrial Relations.

Introductory.

84. If the conclusions regarding the demand for and supply of labour in the immediate future arrived at in Part (iv) of this Memorandum are justified, then it would appear that the North East Coast cannot expect to provide its present population with the means for a standard of life on the level which it has hitherto achieved, without a substantial reorganization of its economic life. Any attempt at such a reorganization, whether by changes in the existing industries or by the introduction and development of new ones, will almost certainly involve labour adjustments which may easily produce such friction between employers and employed as will go far to prevent success. If this is to be avoided close co-operation between the Associations of Employers and the Trade Unions concerned will be necessary. Given the will, such co-operation should not be difficult. There is probably no single industrial area in the country in which, by and large, the organization of capital and labour respectively is so complete and has so long and honourable a history behind it. Labour, in particular, is not only well organized in the separate industries, but by means of various federal bodies, Advisory Councils and such like, the Trade Unions are in regular formal consultation with each other. To a less extent this is true also of the Employers.

1. The Existing Machinery.

85. This well-developed organization on the part of Capital and Labour is due, in the main, to the characteristic large-scale organization of industry in the Survey Area. In each industry the employers are a comparatively small number of firms, each, on

the average, controlling large units of capital and employing correspondingly large bodies of workers. Among these workers, the miner and the skilled craftsman, with a long tradition of trade unionism behind them, have always played a large part. These circumstances have led to the establishment of very efficient machinery for collective bargaining, for the settlement of disputes and for making agreements effective. In each of the principal industries—extractive, constructional, manufacturing, power-supply and transport—this machinery is not merely local in its operations, but is part of a national system governing the conditions of employment in the industry. Since the War these conditions have been simplified by the elimination, to a large extent, of local variations. For each of the principal classes of labour, a generally uniform scale of standard wage-rates as well as of hours, applicable to the whole country, prevails. This in itself is a considerable aid to mobility. Wherever he goes, the worker knows the minimum conditions of pay, etc., which will apply to his particular occupation and that his industrial interests will be safe-guarded. On the North East Coast, as elsewhere, collective bargaining has brought into being a body of men experienced in negotiation—ranging from the shop stewards, foremen and managers in the workshops to the District Committees of the Trade Unions and Local Associations of Employers with their officers, paid and unpaid. In these days their functions are not confined to dealing with questions relating to the internal affairs of the industries; they include consultation and active co-operation with Government Departments—Labour, Health, Mines, the Home Office and others. Work of this sort requires and has produced in the men engaged in it a sense of responsibility, a knowledge of the facts, the practical application of strongly held principles to the problems the facts present, and tolerance and even understanding of opposed opinions. All this is not only of great service to the interests of all directly concerned in industry but is of great social value.

86. There is no need here to describe in detail the machinery set up in each industry. The principles and methods of organization are very similar in each case. The National Agreement for the Avoidance of Disputes between the Engineering Employers' Association and the Amalgamated Engineering Union may be taken as representative. This document provides for the recognition by the management in each federated firm of the shop stewards appointed by the Union. If a dispute in the workshop is not settled there, it is referred to a Local Conference between the District Committee and officials of the Union and the Local Association of the Employers, and if still unsettled, from there to a Central Conference between the National Executives of both parties. In the case of Coal-Mining, Iron and Steel Manufacture, and Ship-building there is a further stage in which an independent Chairman may be brought in as arbiter or conciliator. Only when all this

machinery is exhausted is either side free to use the weapon of the lock-out or strike. On the whole this machinery works well. So far as we are in a position to judge, the relations between employers and employed on the North East Coast are comparatively good; better than in some other industrial centres. In our meetings with representative bodies of Trade Unionists and Employers, we were impressed with the fact, that, frankly critical of each other's conduct and attitude as they were, each paid spontaneous tribute to the good qualities of the other. It was particularly pleasing to note the emphasis laid by the employers on the high qualities of skill and workmanship shown by their workers generally and their deprecation of any charge against them of restricting output, apart from that occasioned by the rigid demarcation between the trades referred to in Pars. 79 and 80 above. Even that complaint was not stressed.

2. Co-Operation in the Organization of Output.

87. The machinery, then, for co-operation in the reorganization of industry exists. How far is it available for this purpose? We are assured that in the manufacture of Iron and Steel, at any rate, a certain amount of co-operation in the organization of output already exists and could without difficulty be extended. But in most cases the machinery is confined to questions of wages and similar conditions of employment. In Shipbuilding a Joint Committee of the Trade Unions and Employers on the organization of the industry has issued a report making agreed recommendations designed to increase the efficiency of production and therefore of competitive power in the world-market. In Engineering, suggestions for a somewhat similar kind of joint enquiry have so far come to nothing. In this industry the machinery for settling disputes works fairly smoothly, but the differences on questions of technical organization are acute. The Trade Unions refuse to accept any responsibility for the organization of output because they have no control over it. The Employers' Association holds rigidly to the view, maintained through two long lock-outs, one of them since the War, that "managerial functions,"—the manning of machines, excessive overtime, etc.—are their sole prerogative. Undoubtedly this attitude is typical, in greater or less degree, of the general relations between Capital and Labour on the North East Coast as in the country as a whole. Despite well-organized and effective machinery and a high degree of mutual respect, the deciding factor in negotiation is the bargaining power inherent in the economic situation which lies behind either party from time to time. The history of the few efforts which have been made to secure co-operation in meeting the difficulties of the last ten years illustrates this point. In the case of the Shipbuilding Joint-Committee mentioned above, when agreement as to the steps necessary to regain prosperity was arrived at, neither party has been sufficiently

assured of either the good-will of the other, or of the efficiency of the proposed scheme to safeguard its particular interests, to make co-operation effective, and little or nothing has resulted. From this atmosphere, co-operation of the kind we think necessary to make most efficient use of the great potential power of the combination of natural resources, business ability and labour skill which exists on the North East Coast, is not likely to emerge.

88. We feel that it is useless to shut our eyes to the fact that, while both employers and employed have a recognized common interest in the prosperity of industry in the Area, each, under present circumstances, has very important and legitimate particular and opposing interests which inevitably come into conflict. It is a conflict which is always present, causing continuous friction and ready to break out into open warfare whenever the crust of organized agreement wears thin, or when for some reason or another an accumulation of grievances bursts through it. Whatever advantages may be claimed for the existing organization and management of industry, this inevitable clash of opposing interests must be set as a liability against the assets. As a matter of plain fact the conditions which necessitated the special arrangements made with organized labour during the War—the "Treasury Agreement," Dilution Commissions and so on—still exist. These arrangements had the sanction of Government behind them. In the emergency of the War and with that sanction the Trade Unions were prepared to relax the various customs and rules which they had maintained as necessary defences against the pressure of the opposing interests of the employers. The employers on their part have these interests to protect against the risk of monopoly power getting into the hands of organized labour. In the present emergency, when it appears that some more or less drastic steps will have to be taken to re-adjust the economic life of the North East Coast if it is to maintain or to improve the standard of life of its population, arrangements similar to that of the war-period may have to be made. Neither efficient machinery for negotiation, nor well-arranged schemes, nor confidence and goodwill, separately, will serve to meet successfully the present difficulties—which after all are only in degree greater than have always existed—but all combined in one effort. There are no substantial signs of any such combination being achieved at present. It may be that the national as well as the local interest may require the intervention of the Government to bring it about. Meantime, however, it is a great advantage that on the North East Coast the machinery exists and that the other difficulties are at least no greater than elsewhere.

APPENDIX.—STATISTICAL TABLES.

TABLE I.—Changes in numbers of Insured Persons (aged 16-64) in Great Britain and on the North East Coast.

Industry Group.	Year.	Insured Workers in Great Britain.		Insured Workers on North East Coast.		Proportion of Insured Workers on N.E. Coast			
						to Insured in the Industries in Great Britain.		to total Insured Population on N.E. Coast.	
		Number.	Index Number.	Number.	Index Number.	Per cent.	Index Number.	Per cent.	Index Number.
0. All Industries ...	1923	10,903,000	98·5	681,120	100·0	6·2	100·0	—	—
	1924	11,061,000	100·0	682,000	100·0	6·2	100·0	—	—
	1927	11,526,000	104·0	682,820	100·0	5·9	96·0	—	—
	1929	11,834,000	107·0	689,630	101·0	5·8	94·5	—	—
	1930	12,138,000	110·0	701,300	103·0	5·8	94·0	—	—
	1931	12,500,000	113·0	712,090	104·5	5·7	92·5	—	—
1. Coal and Coke ...	1923	1,221,740	99·0	237,940	99·5	19·5	101·0	35·0	100·0
	1924	1,235,890	100·0	239,040	100·0	19·3	100·0	35·0	100·0
	1927	1,175,480	95·0	223,180	94·0	19·8	98·0	32·5	93·0
	1929	1,086,630	88·0	212,150	89·0	19·5	101·0	31·0	88·0
	1930	1,081,190	87·5	211,580	88·5	19·6	101·0	30·0	86·0
	1931	1,058,300	85·5	205,190	86·0	19·4	100·0	29·0	84·0
2. Iron Ore Mining and Iron and Steel Manufacture	1923	249,370	102·0	47,560	103·5	19·1	100·0	7·0	103·0
	1924	244,260	100·0	46,020	100·0	18·8	100·0	6·8	100·0
	1927	225,570	92·5	42,040	91·5	18·6	99·0	6·2	91·0
	1929	215,670	88·5	39,610	86·0	18·4	97·5	5·7	85·0
	1930	217,380	89·0	38,920	84·5	17·9	95·0	5·6	82·0
	1931	201,700	82·5	35,800	78·0	17·7	93·5	5·0	74·0

TABLE I.—Changes in numbers of Insured Persons (aged 16-64) in Great Britain and on the North East Coast—cont.

Industry Group.	Year.	Insured Workers in Great Britain.		Insured Workers on North East Coast.		Proportion of Insured Workers on N.E. Coast			
		Number.	Index Number.	Number.	Index Number.	to Insured in the Industries in Great Britain.		to total Insured Population on N.E. Coast.	
						Per cent.	Index Number.	Per cent.	Index Number.
3. Engineering... ..	1923	776,180	103·5	69,410	108·5	8·9	105·0	10·2	108·5
	1924	749,560	100·0	63,920	100·0	8·5	100·0	9·4	100·0
	1927	726,570	97·0	60,690	95·0	8·4	98·0	8·9	95·0
	1929	744,970	99·5	60,660	95·0	8·1	95·5	8·8	94·0
	1930	756,440	101·0	62,170	97·5	8·2	96·5	8·9	95·0
	1931	741,070	99·0	59,560	93·0	8·0	94·0	8·4	89·0
4. Shipbuilding and Ship-repairing	1923	198,140	82·0	59,810	100·5	30·2	122·0	8·8	100·0
	1924	241,270	100·0	59,590	100·0	24·7	100·0	8·7	100·0
	1927	195,990	81·0	51,890	87·0	26·5	107·5	7·6	87·0
	1929	192,480	80·0	54,350	91·0	28·2	114·5	7·9	90·0
	1930	192,310	80·0	54,710	92·0	28·4	115·0	7·8	89·5
	1931	183,790	76·0	51,100	86·0	27·8	113·0	7·2	82·0
5. Chemicals	1923	100,190	106·0	5,910	104·5	5·9	99·0	0·9	104·5
	1924	94,710	100·0	5,660	100·0	6·0	100·0	0·8	100·0
	1927	92,050	97·0	7,860	139·0	8·5	143·0	1·1	139·0
	1929	105,340	111·0	16,460	291·0	15·6	261·5	2·4	289·0
	1930	102,930	108·5	15,950	282·0	15·5	259·5	2·3	268·0
	1931	98,300	104·0	11,770	208·0	12·0	200·0	1·7	199·5

6. Shipping and Canals, Docks, Harbours, etc.	1923	300,050	99·0	22,460	96·5	7·5	97·5	3·3	97·0
	1924	302,940	100·0	23,230	100·0	7·7	100·0	3·4	100·0
	1927	304,340	100·5	25,940	111·5	8·5	111·0	3·8	111·5
	1929	305,770	101·0	24,110	121·0	9·2	120·0	4·1	119·5
	1930	307,210	101·5	26,920	116·0	8·8	114·5	3·8	112·5
	1931	327,300	108·0	28,720	124·0	8·8	114·5	4·0	118·5
7. Building and Public Contracting	1923	786,920	98·0	33,050	103·0	4·2	105·0	4·9	103·0
	1924	804,470	100·0	32,160	100·0	4·0	100·0	4·7	100·0
	1927	951,300	118·5	39,770	123·5	4·2	104·5	5·8	123·0
	1929	969,050	120·5	36,550	113·5	3·8	94·5	5·3	112·5
	1930	995,890	124·0	38,080	118·5	3·8	95·5	5·5	115·0
	1931	1,103,850	137·0	52,780	164·0	4·8	120·0	7·4	157·0
8. Sawmilling, Furniture and Woodwork	1923	171,130	93·0	5,540	100·5	3·2	108·0	0·8	101·0
	1924	183,810	100·0	5,500	100·0	3·0	100·0	0·8	100·0
	1927	199,920	109·0	6,260	114·0	3·1	104·5	0·9	114·0
	1929	211,840	115·5	6,670	121·5	3·1	105·5	1·0	119·0
	1930	215,680	117·5	7,060	128·5	3·3	109·5	1·0	125·0
	1931	222,850	121·5	7,390	134·5	3·3	111·0	1·0	129·0
9. Printing and Paper Trades	1923	335,230	96·5	7,430	97·5	2·2	101·0	1·1	98·0
	1924	348,008	100·0	7,620	100·0	2·2	100·0	1·1	100·0
	1927	365,390	105·0	7,560	99·0	2·1	94·5	1·1	99·0
	1929	381,550	109·5	9,030	118·5	2·4	108·0	1·3	117·5
	1930	394,140	113·5	9,840	130·0	2·5	114·0	1·4	125·5
	1931	405,830	116·5	9,540	125·0	2·4	107·5	1·3	120·0
10. Food, Drink, and Tobacco	1923	477,770	98·0	12,890	99·5	2·7	102·0	1·9	95·5
	1924	488,710	100·0	12,960	100·0	2·6	100·0	1·9	100·0
	1927	500,500	102·5	14,650	113·0	2·9	110·5	2·1	113·0
	1929	501,200	102·5	14,820	114·5	3·0	111·5	2·1	113·0
	1930	513,800	105·0	14,760	114·0	2·9	108·5	2·1	111·0
	1931	522,780	107·0	15,120	116·5	2·9	109·0	2·1	112·0

TABLE I.—Changes in numbers of Insured Persons (Aged 16–64) in Great Britain and on the North East Coast—cont.

Industry Group.	Year.	Insured Workers in Great Britain.		Insured Workers on North East Coast.		Proportion of Insured Workers on N.E. Coast			
		Number.	Index Number.	Number.	Index Number.	to Insured in the Industries in Great Britain.		to total Insured Population on N.E. Coast.	
						Per cent.	Index Number.	Per cent.	Index Number.
11. Distributive Trades	1923	1,212,520	92·5	58,810	89·5	4·8	96·5	8·6	89·5
	1924	1,308,200	100·0	65,830	100·0	5·0	100·0	9·6	100·0
	1927	1,522,950	116·5	75,230	114·5	4·9	98·0	11·0	114·0
	1929	1,646,070	126·0	80,570	122·5	4·9	97·0	11·7	121·0
	1930	1,729,720	132·0	83,610	127·0	4·8	96·0	11·9	123·5
	1931	1,836,680	140·5	89,650	136·0	4·9	97·0	12·6	130·5
12. Hotel, Public House, Restaurant, Boarding House, Club, etc., Service	1923	251,440	92·5	10,270	95·5	4·1	103·0	1·5	95·5
	1924	271,420	100·0	10,770	100·0	4·0	100·0	1·6	100·0
	1927	302,750	111·5	12,120	112·5	4·0	101·0	1·8	112·5
	1929	329,260	121·5	13,460	125·0	4·1	103·0	2·0	123·5
	1930	345,980	127·5	15,120	140·5	4·4	110·0	2·1	136·5
	1931	378,840	139·5	16,360	152·0	4·3	108·5	2·3	145·0
13. Tramway, Omnibus and Other Road Transport	1923	245,340	95·5	8,180	77·5	3·3	81·5	1·2	78·0
	1924	257,410	100·0	10,530	100·0	4·1	100·0	1·5	100·0
	1927	293,470	114·0	13,090	124·5	4·5	109·0	1·9	124·0
	1929	330,790	128·5	15,920	151·0	4·8	117·5	2·3	149·5
	1930	345,310	134·0	16,960	161·0	4·9	120·0	2·4	156·5
	1931	373,200	145·0	18,250	173·5	4·9	119·5	2·6	166·0
14. All other Industries and Services	1923	4,576,980	101·0	101,860	102·5	2·2	101·5	15·0	102·5
	1924	4,530,350	100·0	99,170	100·0	2·2	100·0	14·5	100·0
	1927	4,677,850	103·5	102,540	103·5	2·2	100·0	15·0	103·0
	1929	4,713,380	104·0	101,270	102·0	2·1	98·0	14·7	101·0
	1930	4,940,120	109·0	105,620	106·5	2·1	98·5	15·2	104·5
	1931	5,045,510	111·5	110,860	112·0	2·2	101·0	15·6	108·0

TABLE II.—Changes in numbers of Insured Persons (Aged 16-64) employed in Great Britain and on the North East Coast.

Industry Group.	Year.	Insured Workers employed in Great Britain.		Insured Workers employed on North East Coast.		Proportion of Insured Workers employed on North East Coast			
						to Employed in the Industries in Great Britain.		to total Insured employed population on North East Coast.	
		Number.	Index Number.	Number.	Index Number.	Per cent.	Index Number.	Per cent.	Index Number.
0. All Industries ...	1923	9,675,000	96·5	570,720	96·0	5·9	99·5	—	—
	1924	10,039,000	100·0	594,540	100·0	5·9	100·0	—	—
	1927	10,509,000	105·0	557,260	94·0	5·3	89·5	—	—
	1929	10,706,000	107·0	589,310	99·0	5·5	93·0	—	—
	1930	10,287,000	102·5	548,850	92·5	5·3	90·0	—	—
	1931	9,867,000	98·5	469,330	79·0	4·8	80·0	—	—
1. Coal and Coke ...	1923	1,189,550	101·0	231,580	101·0	19·5	100·0	40·6	105·0
	1924	1,176,300	100·0	229,310	100·0	19·5	100·0	38·6	100·0
	1927	952,050	81·0	176,080	77·0	18·5	95·0	31·6	82·0
	1929	881,130	75·0	184,060	80·0	20·9	107·5	31·3	81·0
	1930	814,750	69·0	164,630	72·0	20·2	103·5	30·0	78·0
	1931	675,900	57·5	127,480	55·5	18·9	97·0	27·2	70·5
2. Iron-Ore Mining and Iron and Steel Manufacture	1923	202,510	102·0	36,590	103·5	18·1	102·0	6·4	108·0
	1924	198,690	100·0	35,300	100·0	17·8	100·0	5·9	100·0
	1927	199,380	100·5	35,100	99·5	17·6	99·0	6·3	106·0
	1929	177,760	89·5	33,990	96·3	19·1	107·5	5·8	98·0
	1930	157,410	79·0	28,830	81·5	18·3	103·0	5·3	88·5
	1931	107,000	54·0	20,900	59·2	19·5	109·5	4·7	79·0

TABLE II.—Changes in numbers of Insured Persons (Aged 16-64) employed in Great Britain and on the North East Coast—cont.

Industry Group.	Year.	Insured Workers employed in Great Britain.		Insured Workers employed on North East Coast.		Proportion of Insured Workers employed on North East Coast			
		Number.	Index Number.	Number.	Index Number.	to Employed in the Industries in Great Britain.		to total Insured employed population on North East Coast.	
						Per cent.	Index Number.	Per cent.	Index Number.
3. Engineering... ..	1923	625,850	98·5	46,900	95·5	7·5	96·5	8·2	99·0
	1924	635,130	100·0	49,200	100·0	7·7	100·0	8·3	100·0
	1927	660,040	104·0	48,000	97·5	7·3	94·0	8·6	104·0
	1929	676,500	106·5	51,760	105·0	7·7	98·5	8·8	106·0
	1930	645,180	101·5	48,640	99·0	7·5	97·5	8·9	107·0
	1931	535,800	84·5	33,140	67·5	6·2	80·0	7·0	85·5
4. Shipbuilding and Ship-repairing	1923	110,760	63·0	23,300	59·5	21·0	94·0	4·1	62·0
	1924	175,160	100·0	39,150	100·0	22·4	100·0	6·6	100·0
	1927	150,900	86·0	36,000	92·0	23·9	107·0	6·4	98·0
	1929	149,170	85·0	39,840	102·0	26·7	119·5	6·8	103·0
	1930	133,270	76·0	34,850	89·0	26·1	117·0	6·3	96·5
	1931	80,200	46·0	15,040	38·5	18·8	84·0	3·2	50·0
5. Chemicals	1923	88,570	103·0	4,990	103·0	5·6	100·0	0·9	107·5
	1924	86,190	100·0	4,840	100·0	5·6	100·0	0·8	100·0
	1927	86,160	100·0	7,070	146·0	8·2	146·0	1·3	155·5
	1929	98,910	115·0	15,700	324·5	15·9	282·5	2·7	328·0
	1930	93,360	108·5	13,580	280·5	14·5	259·0	2·5	304·0
	1931	79,800	92·5	6,440	133·0	8·1	143·5	1·4	168·5

6. Shipping and Canals, Docks, Harbours, etc.	1923	243,050	102.0	17,420	96.8	7.2	94.5	3.0	101.0
	1924	237,840	100.0	18,040	100.0	7.6	100.0	3.0	100.0
	1927	244,180	102.5	19,880	110.0	8.1	107.5	3.6	117.5
	1929	231,310	97.5	20,550	114.0	8.9	117.0	3.5	115.0
	1930	219,540	92.5	17,200	95.5	7.8	103.5	3.1	103.5
	1931	213,650	90.0	15,370	85.0	7.2	95.0	3.3	108.0
7. Building and Public Contracting	1923	681,500	93.5	26,840	96.5	3.9	103.0	4.7	100.0
	1924	729,140	100.0	27,870	100.0	3.8	100.0	4.7	100.0
	1927	873,730	120.0	33,000	118.5	3.8	99.0	6.0	126.0
	1929	871,470	119.5	28,860	103.5	3.3	87.0	4.9	104.5
	1930	852,680	117.0	27,970	100.5	3.3	86.0	5.1	109.0
	1931	898,000	123.0	38,570	138.5	4.3	112.5	8.2	175.0
8. Sawmilling, Furni- ture and Woodwork	1923	162,690	97.0	4,860	97.5	3.0	99.0	0.9	101.5
	1924	167,940	100.0	4,990	100.0	3.0	100.0	0.8	100.0
	1927	188,020	112.0	5,510	110.0	2.9	98.5	1.0	118.0
	1929	196,240	117.0	5,930	119.0	3.0	102.0	1.0	120.0
	1930	191,390	114.0	6,030	121.0	3.2	106.0	1.0	131.0
	1931	182,900	109.0	5,860	117.5	3.2	108.0	1.25	149.0
9. Printing and Paper Trades	1923	314,390	96.0	6,740	98.5	2.2	102.5	1.2	102.5
	1924	327,230	100.0	6,840	100.0	2.1	100.0	1.2	100.0
	1927	347,770	106.5	6,980	102.0	2.0	96.0	1.3	109.0
	1929	367,700	112.5	8,600	125.5	2.3	112.0	1.5	127.0
	1930	377,500	115.5	8,820	129.0	2.3	112.0	1.6	140.0
	1931	361,900	110.5	8,110	118.5	2.2	107.0	1.8	150.0
10. Food, Drink, and Tobacco	1923	434,840	97.5	11,430	97.0	2.6	99.5	2.0	101.0
	1924	446,610	100.0	11,780	100.0	2.6	100.0	2.0	100.0
	1927	465,640	104.0	13,250	112.5	2.8	107.5	2.4	120.0
	1929	466,890	104.5	13,420	114.0	2.9	111.5	2.3	115.0
	1930	461,840	103.5	12,700	108.0	2.7	104.5	2.3	117.0
	1931	451,300	101.0	12,050	102.0	2.7	101.0	2.6	129.5

TABLE II.—Changes in numbers of Insured Persons (Aged 16-64) employed in Great Britain and on the North East Coast—cont.

Industry Group.	Year.	Insured Workers employed in Great Britain.		Insured Workers employed on North East Coast.		Proportion of Insured Workers employed on North East Coast			
						to Employed in the Industries in Great Britain.		to total Insured employed population on North East Coast.	
		Number.	Index Number.	Number.	Index Number.	Per cent.	Index Number.	Per cent.	Index Number.
11. Distributive Trades	1923	1,140,980	93·0	54,820	90·0	4·8	96·5	9·6	93·5
	1924	1,226,790	100·0	61,010	100·0	5·0	100·0	10·3	100·0
	1927	1,451,370	118·5	69,000	113·0	4·8	95·5	12·1	118·0
	1929	1,555,540	127·0	73,180	120·0	4·7	94·5	12·4	121·0
	1930	1,589,610	129·5	73,290	120·0	4·6	92·5	13·4	130·0
	1931	1,641,200	134·0	76,270	125·0	4·6	95·5	16·3	158·5
12. Hotel, Public House, Restaurant, Boarding House, Club, etc., Service	1923	226,550	92·0	9,060	95·0	4·0	98·5	1·6	99·0
	1924	245,640	100·0	9,530	100·0	3·9	100·0	1·6	100·0
	1927	290,890	118·5	10,850	114·0	3·7	96·0	2·0	121·5
	1929	307,860	125·5	11,930	125·0	3·9	100·0	2·0	126·5
	1930	306,340	124·5	11,920	125·0	3·9	100·5	2·2	135·5
	1931	321,000	130·5	12,260	128·5	3·8	95·5	2·6	163·0
13. Tramway, Omnibus, and Other Road Transport	1923	219,970	95·0	6,760	74·5	3·1	78·5	1·2	77·5
	1924	231,380	100·0	8,070	100·0	3·9	100·0	1·5	100·0
	1927	272,970	118·0	11,170	123·0	4·1	107·0	2·0	131·5
	1929	307,630	133·0	13,730	161·5	4·4	114·0	2·3	153·0
	1930	313,370	135·5	14,260	157·0	4·5	116·0	2·6	170·0
	1931	330,800	143·0	15,010	165·5	4·7	119·0	3·2	210·0
14. All other Industries and Services	1923	4,033,790	97·0	89,430	102·0	2·2	105·0	15·7	106·5
	1924	4,154,960	100·0	87,510	100·0	2·1	100·0	14·7	100·0
	1927	4,326,290	104·0	85,370	97·5	2·0	93·5	15·3	104·0
	1929	4,417,890	106·5	87,760	100·0	2·0	93·5	14·8	101·0
	1930	4,130,760	99·5	86,100	98·5	2·1	98·5	15·7	106·5
	1931	3,987,550	96·0	82,850	94·5	2·1	98·5	17·7	120·0

TABLE III.

Changes in the number of persons insured and employed, with percentages of unemployed in all industries on the North East Coast. 1923-1931.

Year (July).	Insured Persons (16-64).					Employed Parsons.					Percentage Unemployed.				
	M.	B.	W.	G.	T.	M.	B.	W.	G.	T.	M.	B.	W.	G.	T.
1923 ...	564,670	40,070	64,960	11,420	681,120	462,250	38,210	59,520	10,740	570,720	18.1	4.6	8.4	6.0	16.2
1924 ...	561,120	41,340	67,260	12,280	682,000	480,960	39,760	62,120	11,700	594,540	14.3	3.8	7.6	4.7	12.8
1927 ...	559,410	39,460	70,630	13,320	682,820	441,490	36,980	66,070	12,720	557,260	21.1	6.3	6.4	4.5	18.4
1929 ...	561,260	39,920	73,670	14,780	689,630	468,200	38,510	68,560	14,040	589,310	16.6	3.5	6.9	5.0	14.5
1930 ...	567,840	39,640	78,160	15,660	701,300	430,250	36,500	67,470	14,620	548,840	24.2	7.9	13.7	6.6	21.7
1931 ...	574,930	38,320	82,810	16,030	712,090	354,480	31,940	68,540	14,370	469,330	38.3	16.6	17.2	10.4	34.1

TABLE IIIA.—Index numbers from Table III. 1924=100.

	Insured Persons.					Employed Parsons.				
	M.	B.	W.	G.	T.	M.	B.	W.	G.	T.
1923 ...	100.6	96.9	96.6	93.0	99.9	96.0	96.1	95.8	91.8	96.0
1924 ...	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1927 ...	99.7	95.5	105.0	108.5	100.1	91.8	93.0	106.4	108.7	93.6
1929 ...	100.0	96.6	109.5	120.4	101.1	97.3	96.9	110.4	120.0	99.1
1930 ...	101.2	95.9	116.2	127.5	102.8	89.5	91.8	108.6	125.0	92.3
1931 ...	102.5	92.7	123.1	130.5	104.4	73.7	80.3	110.3	122.8	78.9

TABLE IV.—*Mobility of Labour.—Origin and Dispersion of Books.—All Industries—Men.—Lodged Books and Others.*

Exchanges at which the Books were exchanged in July, 1931.	Exchanges at which the Books were originally issued.														Totals.
	Newcastle, Heaton, Elswick, Walker.	Gateshead.	Middlesbrough.	Bishop Auckland.	Consett.	Darlington.	South Shields.	Stockton.	Sunderland, Pallion, Southwick.	Ashington.	Blyth.	Wallsend.	Others inside the Area.	Outside the Area.	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	
I. Newcastle, Heaton, Elswick, Walker.	32,494	2,009	168	35	82	48	638	26	357	64	330	2,472	4,828	2,156	45,707*
II. Gateshead ...	1,383	8,720	9	8	24	4	73	6	55	7	15	232	2,025	425	12,986
III. Middlesbrough ...	131	12	16,101	10	14	69	17	515	32	3	3	10	1,727	974	19,618
IV. Bishop Auckland ...	17	8	7	4,304	12	16	2	5	7	—	—	—	1,781	103	6,263
V. Consett ...	95	26	5	117	7,038	14	12	8	18	1	1	4	3,499	171	11,009
VI. Darlington ...	84	30	66	57	1	10,777	25	68	18	2	3	3	464	714	12,312
VII. South Shields ...	186	44	31	5	6	35	13,476	5	171	8	30	59	1,152	954	16,162
VIII. Stockton ...	246	233	2,641	142	7	562	24	8,433	117	14	5	139	1,723	1,234	15,520
IX. Sunderland, Pallion, Southwick.	279	55	47	37	13	15	223	18	18,593	10	15	40	1,927	1,177	22,449
X. Ashington ...	65	35	1	4	—	—	10	1	10	8,281	48	12	1,224	371	10,062
XI. Blyth ...	62	6	8	—	—	1	32	—	12	582	4,287	9	742	268	6,009†
XII. Wallsend ...	635	112	13	11	10	2	95	1	19	14	7	4,602	1,300	377	7,198
Total ...	35,677	11,290	19,097	4,730	7,207	11,543	14,627	9,086	19,409	8,986	4,744	7,583	22,392	8,924	185,291

* Excludes 8,948 books dispatched before inclusion in this return.

TABLE V.—*Mobility of Labour.—Proportions of "Foreign" Books.—All Industries—Men.—Lodged Books and Others.*

Exchanges at which the Books were exchanged in July, 1931.	Total number of Books exchanged.	Number of "Local Foreign" Books exchanged.	Proportion of "Local Foreign" Books to the total exchanged.		Number of "Non-local Foreign" Books exchanged.	Proportion of "Non-local Foreign" Books to the total exchanged.	Number of "Foreign" Books exchanged (local and non-local).	Proportion of all "Foreign" Books (local and non-local) to the total exchanged.	
				*					*
I. Newcastle, Heaton, Elswick, Walker.	45,707	11,057	24·2	13·0	2,156	4·7	13,213	28·9	17·7
II. Gateshead	12,986	3,841	29·6	16·6	425	3·3	4,266	32·9	19·9
III. Middlesbrough	19,618	2,543	13·0	10·3	974	5·0	3,517	17·9	15·3
IV., Bishop Auckland	6,263	1,856	29·6	29·4	103	1·6	1,959	31·3	31·0
V. Consett	11,009	3,800	34·5	33·5	171	1·5	3,971	36·1	35·0
VI. Darlington	12,308	817	6·6	6·6	714	5·8	1,531	12·4	12·4
VII. South Shields	16,162	1,732	10·7	8·9	954	5·9	2,686	16·6	14·8
VIII. Stockton	15,520	5,853	37·7	20·7	1,234	7·9	7,087	45·7	28·6
IX. Sunderland, Pallion, Southwick.	22,449	2,679	11·9	11·9	1,177	5·2	3,856	17·2	17·1
X. Ashington	10,062	1,410	14·0	13·5	371	3·7	1,781	17·7	17·2
XI. Blyth	8,009	1,454	24·2	14·5	268	4·5	1,722	28·7	19·0
XII. Wallsend	7,198	2,219	30·8	19·1	377	5·2	2,596	36·1	24·3
Totals	185,291	39,261	21·2	14·8	8,924	4·8	48,185	26·0	19·6
Tyneside	82,053	10,911	—	13·3	3,912	4·8	14,823	—	18·1
Tees-side	35,138	5,240	—	14·9	2,208	6·3	7,448	—	21·2

* Corrected figures (i.e., after correction for movement within the immediate vicinity).

TABLE VI.—*Mobility of Labour.—Origin and Dispersion of Books.—All Industries—Women.—Lodged Books and Others.*

Exchanges at which the Books were exchanged in July, 1931.	Exchanges at which the Books were originally issued.														Totals.
	Newcastle, Heaton, Elswick, Walker.	Gateshead.	Middlesbrough.	Bishop Auckland.	Consett.	Darlington.	South Shields.	Stockton.	Sunderland, Pallion, Southwick.	Ashington.	Blyth.	Wallsend.	Others inside the Area.	Outside the Area.	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	
I. Newcastle, Heaton, Elswick, Walker.	12,061	973	12	2	9	16	77	2	136	6	26	160	722	273	14,475*
II. Gateshead ...	437	2,865	—	1	2	1	7	—	5	1	7	16	170	82	3,594
III. Middlesbrough ...	60	5	3,474	2	1	39	2	134	5	—	—	2	280	188	4,192
IV. Bishop Auckland ...	20	1	—	184	—	4	1	1	2	—	—	—	54	15	282
V. Consett ...	11	—	—	2	485	—	1	—	—	—	1	—	20	6	527
VI. Darlington ...	41	5	6	14	8	1,641	5	9	7	—	—	1	45	76	1,858
VII. South Shields ...	80	5	1	1	4	—	2,363	1	39	—	3	2	131	70	2,700
VIII. Stockton ...	44	6	152	1	—	16	3	1,663	18	—	2	4	91	118	2,118
IX. Sunderland, Pallion, Southwick.	120	10	11	5	1	3	45	4	4,316	2	—	5	132	154	4,808
X. Ashington ...	6	2	—	—	—	—	—	—	1	350	4	2	15	5	385
XI. Blyth ...	9	1	—	—	—	—	1	—	—	—	351	2	36	12	412†
XII. Wallsend ...	105	12	1	1	—	—	—	1	3	2	1	499	58	17	700
Total ...	12,994	3,885	3,657	213	510	1,720	2,505	1,815	4,532	361	395	694	1,754	1,016	36,051

* Excludes 3,132 Books dispatched before inclusion in this return.

TABLE VII.—*Mobility of Labour.—Proportions of " Foreign " Books.—All Industries—Women.—Lodged Books and Others.*

Exchanges at which the Books were exchanged in July, 1931.	Total number of Books exchanged.	Number of " Local Foreign " Books exchanged.	Proportion of " Local Foreign " Books to the total exchanged.		Number of "Non-local Foreign " Books exchanged.	Proportion of " Non-local Foreign " Books to the total exchanged.	Number of " Foreign " Books exchanged (local and non-local).	Proportion of all " Foreign " Books (local and non-local) to the total exchanged.	
				*					*
I. Newcastle, Heaton, Elswick, Walker.	14,475	2,141	14·8	6·4	273	1·9	2,414	16·7	8·3
II. Gateshead	3,594	647	18·0	5·2	82	2·3	729	20·3	7·5
III. Middlesbrough	4,192	530	12·6	9·4	188	4·5	718	17·1	13·9
IV. Bishop Auckland	282	83	29·4	29·4	15	5·3	98	34·7	34·7
V. Consett	527	36	6·8	6·4	6	1·1	42	8·0	7·6
VI. Darlington	1,858	141	7·6	7·6	76	4·1	217	11·7	11·7
VII. South Shields	2,700	267	9·9	6·7	70	2·6	337	12·5	9·3
VIII. Stockton	2,118	337	15·9	8·7	118	5·6	455	21·5	14·3
IX. Sunderland, Pallion, Southwick.	4,808	338	7·0	7·0	154	3·2	492	10·2	10·2
X. Ashington	385	30	7·8	6·8	5	1·3	35	9·1	8·1
XI. Blyth	412	49	11·9	11·9	12	2·9	61	14·8	14·8
XII. Wallsend	700	184	26·3	9·6	17	2·4	201	28·7	12·0
Totals	36,051	4,783	13·3	7·2	1,016	2·8	5,799	16·1	10·0
Tyneside	21,469	1,365	—	6·4	442	2·0	1,807	—	8·4
Tees-side	6,310	581	—	9·2	306	4·9	887	—	14·1

* Corrected figures (i.e., corrected for contiguity).