

BOARD OF TRADE

INDUSTRIAL SURVEY
OF THE
LANCASHIRE AREA

(EXCLUDING MERSEYSIDE)

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The Victoria
University of Manchester.
Department of Commerce.
February 17th, 1932.

*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 Manchester was invited to conduct an industrial survey of the Lancashire 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 have now the honour to submit the accompanying report on the above matters.

We have the honour to be,

Sir,

Your obedient Servants,

G. W. DANIELS.
JOHN JEWKES.

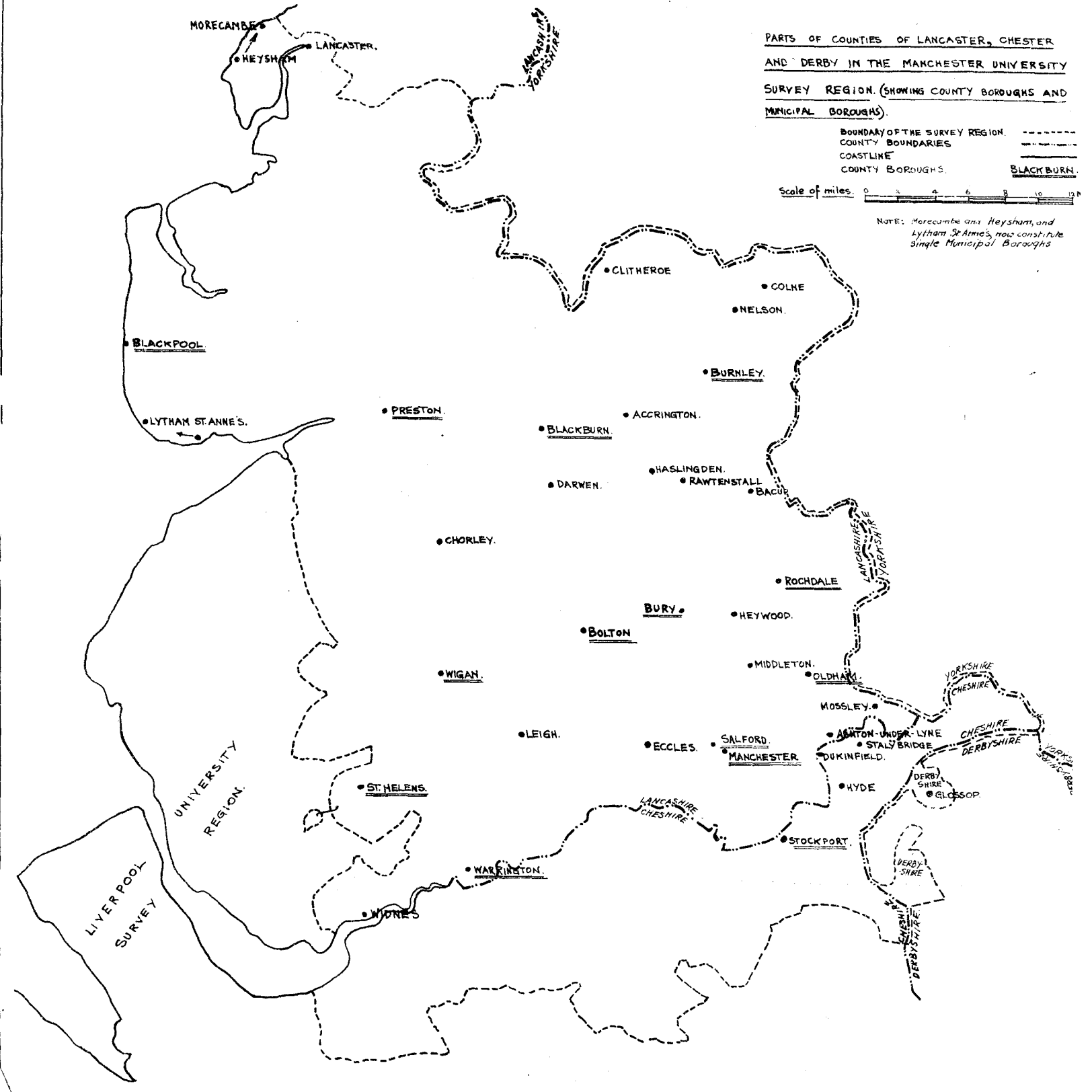
MAP OF THE SURVEY REGION.

PARTS OF COUNTIES OF LANCASTER, CHESTER
AND DERBY IN THE MANCHESTER UNIVERSITY
SURVEY REGION. (SHOWING COUNTY BOROUGHS AND
MUNICIPAL BOROUGHS)

BOUNDARY OF THE SURVEY REGION. - - - - -
COUNTY BOUNDARIES. - - - - -
COASTLINE. ————
COUNTY BOROUGHS. BLACKBURN.

Scale of miles. 0 2 4 6 8 10 12

NOTE: Morecambe and Heysham, and
Lytham St Anne's, now constitute
single Municipal Boroughs



MAP OF THE SUB-AREAS IN THE SURVEY REGION.

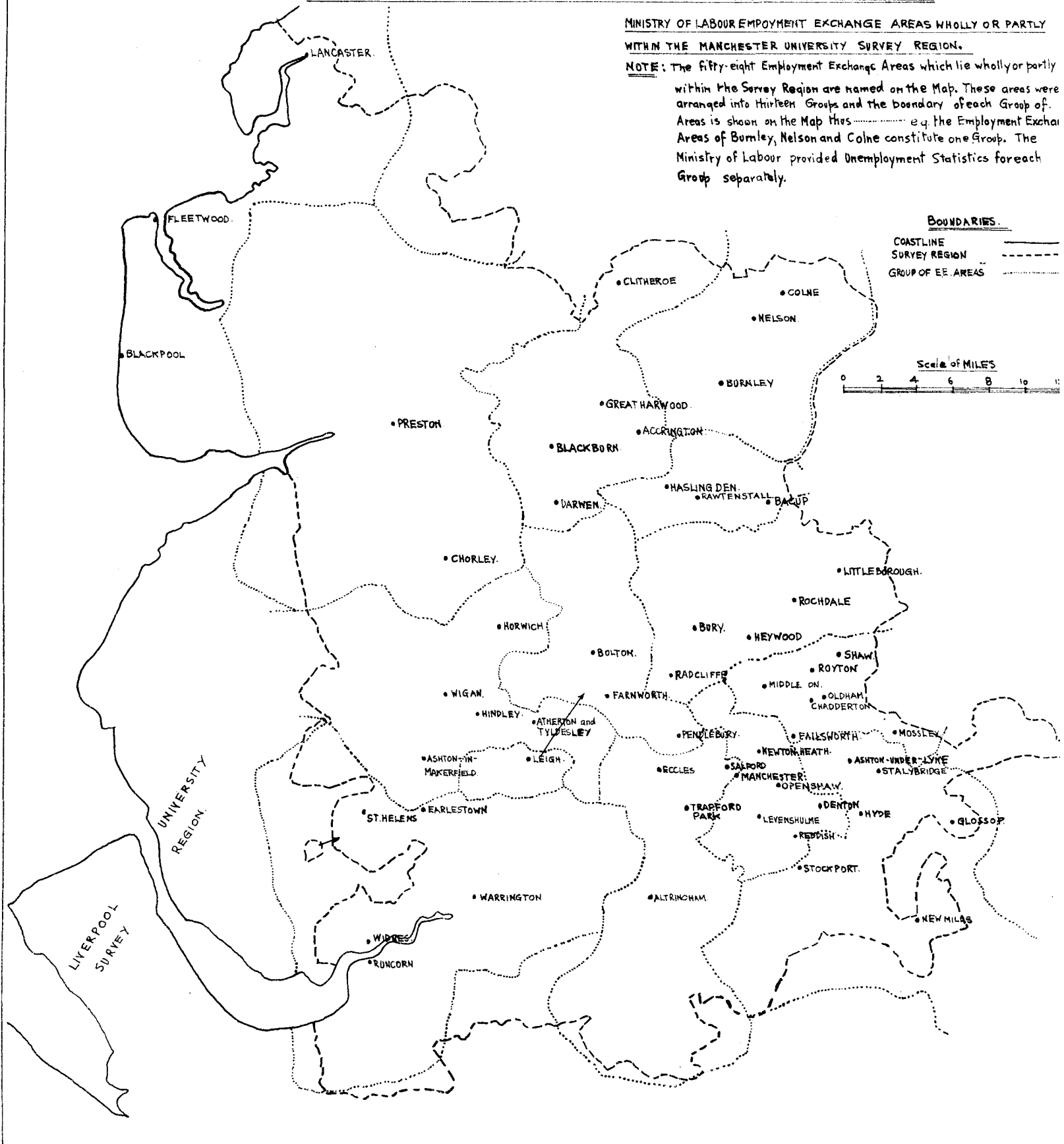
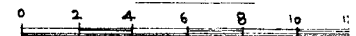
MINISTRY OF LABOUR EMPLOYMENT EXCHANGE AREAS WHOLLY OR PARTLY
WITHIN THE MANCHESTER UNIVERSITY SURVEY REGION.

NOTE: The fifty-eight Employment Exchange Areas which lie wholly or partly within the Survey Region are named on the Map. These areas were arranged into thirteen Groups and the boundary of each Group of Areas is shown on the Map thus e.g. the Employment Exchange Areas of Burnley, Nelson and Colne constitute one Group. The Ministry of Labour provided Unemployment Statistics for each Group separately.

BOUNDARIES.

COASTLINE —————
SURVEY REGION - - - - -
GROUP OF EE AREAS

Scale of MILES



PREFACE.

This report is the outcome of the collaboration of a number of investigators connected with the Departments of Economics, Commerce, and Administration in the University of Manchester. Mr. T. S. Ashton was responsible for the study of the trends of population between 1851 and 1921. Mr. E. M. Gray carried through a very detailed investigation, of which only a summary could be given in this Report, of recent technical changes in the cotton industry and their relation to the demand for labour. Miss F. Collier and Mr. S. G. Roberts undertook the difficult task of recording the changes in structure and trends of employment in the clothing industry, a task which involved a great deal of interviewing and first hand enquiry into the position of several trades of which little was known. The chapter on Agriculture in Lancashire and Cheshire was the work of Mr. J. Orr; that on Local Rates and Industry the work of Mr. D. N. Chester; and the study of the coalmining industry the result of investigations by Mr. W. Prest. Mr. A. L. Dakyns was largely responsible for the chapter dealing with employment among Local Authorities. The chapter on the metal and engineering trades arose out of enquiries undertaken by Mr. J. B. Andrew. The making of several maps, essential for the Survey, was carried out by the Geography Department under Professor H. J. Fleure.

The organisation and co-ordination of the Survey, and the preparation of the remaining chapters, were in the hands of the Research Section of the above Departments of which Mr. J. Jewkes is Supervisor and Mr. A. Winterbottom Principal Assistant.

It would be impossible to name individually the many organisations and firms which have willingly given help and information to these workers. The greatest obligation must be to the Ministry of Labour, through its officers both at Headquarters and the North-Western Divisional Office, which has provided the great mass of statistics upon which the Report is based. It is impossible to speak too highly of the willing advice and help received from this source. Other Government Departments have provided much statistical information—notably the Board of Trade, the Home Office, the Ministry of Health, the Ministry of Transport, the Department of Mines, the Department of Agriculture, and the Electricity Commission. Local officials connected with Employment Exchanges, Trade Boards, and Factory Inspection, have also shown themselves most ready to help.

The Local Authorities in the Survey Region have gone to great pains to provide complete information in connection with a number of questionnaires despatched to them and, in some cases, have

instituted special enquiries for the purpose. In particular, various Electricity undertakings have made available for the Survey details of the industrial consumption of electric power. In the numerous industries investigated it was usual to find a keen desire to assist among Employers' Organisations, Trade Unions, and private Employers, and thanks are due to the many who have assisted by providing information which has served for the present enquiry, and will serve as a basis for future enquiries.

G. W. DANIELS.

INTRODUCTION.

The Terms of Reference.—When the Universities of Liverpool and Manchester were invited, in March, 1931, to conduct an Industrial Survey of Lancashire, the terms of reference were designedly left fairly wide in order that the final reports should cover as large a field as was possible in the time available, and should embody a study of those matters which the investigators believed to be most closely bound up with the industrial future of the county. It was, however, implied that, within this wide field of research, emphasis should be placed upon the question of employment and unemployment and that other matters of great importance, such as changes in the internal structure of industries, and technical developments, should be dealt with only in so far as they react upon the present or probable future supply of and demand for labour.

The work of the Survey, therefore, fell naturally into two parts. It was necessary, in the first place, to determine what amount of labour in the several industries in the area could be regarded as surplus; what causes had led to its appearance; what characteristics the surplus possessed which might affect the possibility of its transfer or absorption; what indications there were of a natural drainage by migration of the over-supply of labour; and to what degree those trends in the supply of and demand for labour which could be forecasted indicated an approaching modification of the problem.

The second phase of the work was concerned with the steps which might be taken, by conscious policy, to deal with the semi-permanent pools of unemployed workers, and, in this connection, attention has been particularly directed to the question of the development of new businesses and industries within the area. The forces which ultimately determine the localisation of industry are complex and difficult to identify in practice, and even when the measurable factors—such as the price and quality of labour, the cost of power, the convenience of sites, the level of local rates, or the proximity to markets—have been eliminated, there still remain many elements, psychological or entirely non-economic, which perhaps have as great an influence upon the appearance and disappearance of businesses and industries as do the purely economic forces.

No effort has been made, therefore, to determine what are the relative advantages of Lancashire and other parts of the country as locations for particular concerns or industries. Questions of this kind are matters of business policy; answers to them would vary from one concern to another, following the peculiar circumstances of each, and, generally speaking, they are not susceptible to quantitative treatment. There are, nevertheless, certain aspects of the growth of the smaller industries in Lancashire upon which it has

been possible to throw some light. How far, for example, have the smaller and "newer" industries been growing in the area since the end of the War? Can expansion in them bring substantial relief to the labour in the depressed industries? Are the vital ancillary services, such as electric power supply, meeting the demands of industry efficiently and with imagination? What general changes in the industrial environment are possible and desirable in order to make the area more capable of supporting fresh industrial growth?

It would be a mistake to assume, however, that the great staple industries of Lancashire have now stabilised their position and that the growth of new industries will constitute a net enlargement of the economic activity of the area. The older industries, no less than the newer, are in a stage of transition, and the future of the area is bound up as closely with movements in the older industries as with those in the newer. In the second part of the work of the Survey, therefore, it has been necessary to consider how far the older industries might increase their demand for labour.

The Extent of the Survey Region.—The area upon which the Universities of Liverpool and Manchester were asked to report was roughly described as "Industrial Lancashire". At an early stage in the investigations it became apparent that the most convenient form of collaboration between the Universities would be through a division of territory which would leave to Liverpool University the trading, commercial and distributive activities around that city, and to Manchester University the area of manufacturing industries in the county of Lancashire and the adjoining fringes of Cheshire and Derbyshire. This division had the advantage of enabling each University to work in the area of which it had local knowledge and in which it had already carried out economic or social research.

The "Survey Region" of Manchester University comprises that part of Lancashire which lies to the south of a line running eastwards from Lancaster to the county boundary, and to the east of a line following the coast from Lancaster to Preston and thence through St. Helens to Runcorn. In the south the industrial and residential fringe of Cheshire and Derbyshire, which economically is bound up with Lancashire, is also included.* At the 1931 Census this Region contained 4,214,809 persons (10.6 per cent. of the total in England and Wales), and at July, 1930, 1,488,510 persons insured under the Unemployment Insurance Acts (12.0 per cent. of the total in Great Britain and Northern Ireland).

For some purposes it has been necessary to break up the Region into Sub-Areas, and these, shown in the map given in the front of

* See map facing p. iv.

the Report, have been chosen so as to group together, as far as possible, industrial activity of the same nature.*

Although in many cases the statistics available related strictly to the Survey Region, in others information had to be collected for slightly different areas. The Employment Exchange areas for which figures of insured population, unemployed persons, etc., were obtained, occasionally overrun the boundaries of the Region, but not to any important degree. In the case of coalmining, certain series relate to "Lancashire and Cheshire". The Census of Production uses the area "Lancashire with North Cheshire and the Glossop and New Mills Districts of Derbyshire", which includes North Lancashire, Cumberland and Westmorland, and the Liverpool University Survey Region. Certain statistics of the Ministry of Labour were available only for the North-Western Division. In the study of electricity supply it was found that the boundaries of some authorised undertakings overrun those of the Survey Region. In many cases, in asking for special returns from the Lancashire County Council or from private businesses, information only for the whole of Lancashire was available. And on many other occasions the strictly defined Survey Region has been discarded. The multiplicity of statistical boundaries would, of course, have rendered any region chosen subject to these difficulties. It is not likely, however, that the general conclusions of the Survey will be invalidated in any serious way by these boundary difficulties.

The Plan of the Report.—This Report consists of two parts. Part I embodies the summarised conclusions of the present position and a discussion of the long-period remedies which might be applied to deal with surplus labour. Part II consists of a series of chapters treating of the manifold phases of the economic activity of the Region upon which the conclusions are based. It cannot be overstressed that the generalisations of Part I are based on statistics often subject to important qualifications which have prevented the findings from being more precise. An attempt has been made in Part II to detail these qualifications and to indicate what degree of validity, among the infinite gradations of reliability that any group of statistics may claim, attaches to each series employed.

* The Sub-Areas are based upon Employment Exchange areas. Unfortunately there have been certain modifications in these areas since 1923, which introduce error in comparisons over a period. These modifications are described in detail on p. 86.

PART I.

CHAPTER I.

THE MEANING OF THE TERM "SURPLUS LABOUR".

In embarking upon estimates of "surplus labour", we are attempting to measure something which can have no precise theoretical definition even at a given moment and which becomes even vaguer in meaning over a period of changing economic conditions. There is, however, little need to offer apologies for the admittedly approximate conclusions which will be drawn later. The outlines of the urgent labour problems to be met in Lancashire are too substantial to be obliterated by theoretical reservations. Although accurate measurements cannot be made, it can be shown that there is a surplus so large that something more than haphazard and undirected regulating forces will be necessary to drain it, and that the remedial measures so far employed have not been, and cannot be, adequate in themselves. Some of the theoretical reservations, however, may be briefly noticed.

The Nature of Surplus Labour.

The conception of a surplus of labour, at any point of time, is bound up with the parallel idea that, of the population, a certain number of persons are "occupiable" in the sense that they are capable of, willing to, and normally must work by being "occupied" in return for a money remuneration. Once the size of this occupiable population is given, the surplus of labour consists of those in this population who are not thus occupied. In thinking of this occupiable population, however, one normally excludes from it those below 14 and those above about 70 years of age; moreover, in certain occupations there are legal and other restrictions, e.g., such as apply to women and juveniles, which further limit the scope of this term. These limitations are fairly definite, but there are others less clear-cut. Whether a person is "capable of work" will depend not only upon his skill or strength but also upon the wage he demands. Each member of the occupiable population is capable of some work; those who are discarded by industry on the grounds of incapacity are those who are not sufficiently capable to justify the remuneration demanded. "Incapacity", therefore, will vary with changes in the prevailing rates of remuneration. Again, in many cases "willingness to work" will depend upon the wages that can be obtained, not only by the individual immediately concerned, but by others. In Lancashire this is frequently the position where the offer of work is to women. In the cotton industry, for example, very large numbers of women find employment. But the numbers seeking this sort of employment will depend upon the family income. Thus, a considerable increase in

women's wages in the industry would tempt back many married women who had retired from it and the occupiable population would expand. As the events of the past five years show, a similar result would be likely to follow upon a serious reduction in the earnings of married men in the county, through the female members of the family becoming willing to take up employment again to maintain the family income. Other criticisms could be advanced against giving a quantitative meaning to the term occupiable population, but sufficient has been said to make it clear that no precise statistical meaning can be given to it, and, in consequence, the lack of precision is found also in the term surplus labour.

When the term is considered in relation to industry as a whole, the theoretical difficulties are enormous, and, even if the issue is narrowed and surplus labour is considered in relation to specific industries, they are still great. Surplus is something which is expressed in numbers of persons. In an industry producing a given quantity of goods the surplus will, therefore, depend upon how many hours a day each person is working. Thus the reduction of weekly hours of work in the cotton industry from 55½ to 48 in 1921, would, unless hourly output had increased proportionately, have automatically required an increase in the number of persons to maintain the previous output. Similarly, other things being equal, the surplus will depend upon how hard people wish to, or are allowed to work. In a later chapter* it is shown that the surplus in the weaving section of the cotton industry, measured in terms of weavers who do not get any work at all, is much less than it would be if account were taken of many weavers who are "under-employed" on two or three looms instead of four. Is there, then, some element of surplus in such an under-employed weaver, and, if so, does the fact that some weavers are now working six or more looms mean that even the four-loom weaver is now a part of the surplus?

When broader economic changes are envisaged further difficulties become apparent. The volume of goods which a competitive industry will dispose of will depend upon general demand, which is subject to fluctuations consequent upon changes in tastes and habits, and upon the efficiency of that industry in relation to that of rival industries. Changes in general efficiency, from whatever cause, will, therefore, have an effect upon the volume of goods to be produced and influence the figure of surplus labour, and, in a number of Lancashire industries—particularly cotton—important changes in structure and organisation are imminent. Increased competitive efficiency arising out of a fall in labour costs is a special case under this head. Where wages are changing appreciably, important reactions are likely to play upon the demand for labour and influence the extent of the surplus.

* See Part II, Chapter 4.

Even whilst this report was being prepared the departure of this country from the gold standard again proved that all estimates run the hazard of being made inapplicable through the occurrence of unpredictable events in a constantly changing economic world. It is impossible to prophesy what the results of this momentous step will be. At the moment (January, 1932) some stimulus appears to have been given to the export trade of the Region.* But quite obviously the ultimate effects will depend upon many other factors, national and international, which will determine whether this advantage will be permanent. Similarly, the recent change in the fiscal policy of this country is likely to bring into play numerous new factors, particularly in the exporting trades.

In certain cases, increased activity in a group of industries might not reduce the general surplus, since it would automatically result in a decrease of employment elsewhere. At present, for example, large numbers of workers in Lancashire are engaged upon State-aided Relief Schemes which might be discontinued, or slowed down, should general conditions improve, and these workers would then find it necessary to re-attach themselves to their old or other occupations.

Finally, the relation between surplus labour and technical changes in production is to be noticed. In later chapters the changes of this description which have gone on in some of the most important Lancashire industries since the end of the War are described. It is apparent that the speed with which new labour-saving devices are introduced and the extent to which the organisation of concerns is tightened up, and unnecessary labour eliminated, influence the number of persons who will be out of work in a given industry at a given moment. But it is often dangerous to argue that any ascertainable increase in unemployment is *caused* by the technical changes. The changes may have been called for in order to stem a decline in the volume of sales, and, in this case, it might have happened that, if they had not been introduced, and prices had not been lowered, the unemployment, arising through a shrinkage of output, would have been much greater than it actually was after the technical reorganisation.†

Of course, if, for example, the cotton industry in all countries, were to improve methods of production then, if the elasticity of demand for cotton products were such that the percentage increase in output per head were greater than the percentage increase in total demand, labour would be displaced from the industry. But, generally speaking, in thinking of any particular industry subject to competition, it would be dangerous to assume that the extent of

* See Part I, Chapter 4.

† One interesting practical difficulty which arises from this is found in the engineering industry (Part II, Chapter 6), where it was found that the firms which had made the most drastic technical reorganisation were also the firms which had most rapidly increased the numbers employed, presumably because they were taking trade from firms in this country or in other countries.

unemployment that might exist after the introduction of technical changes would not have existed if these changes had not been introduced.

Whilst, therefore, the number of people really attached to any industry remains undefinable; whilst wages and the efficiency of organisation can change rapidly; whilst demand can fluctuate over a period with changes in tastes, the imposition of tariffs, or political disturbances; whilst capital and labour are alternative factors of production, the precision that can be attached to any estimate of surplus labour is limited from a theoretical point of view.

The Nature of the Estimates of Surplus.

The estimates of surplus which have been made in this report are based almost wholly upon the unemployment recorded in the industries of the Survey Region by the Ministry of Labour's statistics of "books lodged". The limitations of this valuable source of information are important, and they are referred to in detail elsewhere.* It cannot be assumed that the insured population in any industry will strictly coincide with the occupiable population. An insured person who does not contemplate working more than two or three days a week—e.g., a married woman cotton weaver who joins at four looms with another woman weaver, or a weaver who is willing to deputise from time to time for persons absent through illness—is counted as a unit and equal to a worker who desires full-time employment. Again, the legal and administrative changes in the Unemployment Insurance Scheme up to 1930 undoubtedly brought into the insured population large numbers of persons who, through age or disability, were not really capable of industrial work. Numbers of persons may thus have been counted as part of the surplus who are not strictly a part of the occupiable population. Similarly, the numbers of insured persons recorded as unemployed may diverge from the numbers not at work but available for employment in an industry. Those who fall out of benefit have no longer the same incentive to continue registering.† And, in particular, many juveniles do not maintain constant registration.‡

The fundamental difficulty, however, in forming estimates has been that of fixing a "base" period which could be regarded as typical and normal for post-war conditions.

* See Part II, Chapters 2 and 4.

† But see the evidence of Mr. John Hilton before the Unemployment Insurance Commission, 34th day, p. 1160, where he points out that two factors work towards the continuance of registration: (a) Many Poor Law authorities require, as one of the conditions on which out-door relief is given, that an able-bodied person applying for relief shall maintain registration. (b) By maintaining registration, an unemployed person who is insured under the Health Insurance Scheme can have his Health card franked and thus avoid the accumulation of arrears of Health Insurance contributions.

‡ See p. 111.

For many reasons, the year 1929 appears to be the most appropriate, and, broadly speaking, the analysis of surplus labour is based upon the recorded unemployment in that year. But the conditions in 1929 cannot be accepted as a datum line with equal confidence in all industries, and in the chapters devoted to different industries in Part II certain reservations accompany the estimates of surplus.

CHAPTER 2.

THE EXTENT AND DISTRIBUTION OF THE SURPLUS OF LABOUR.

In the preceding chapter some indication has been given of the more important theoretical reservations which attach to the interpretation of the term "surplus labour," and the difficulties involved in selecting any year which would constitute an appropriate datum line from which to measure the surplus of labour in the Survey Region have been discussed. Two conclusions were reached: first, that such is the magnitude of the labour problems of the Region that these theoretical reservations and difficulties cannot substantially affect the value and significance of the broad estimates of surplus which can be arrived at on the basis of the unemployment statistics of the Ministry of Labour; second, that the conditions prevailing in 1929 were sufficiently "normal," at any rate in relation to what preceded them, as to justify us in basing our estimates of post-war surplus upon the figures of unemployment recorded in that year. Consequently, it is proposed in this section to give answers to the following questions. Assuming that when the present abnormal depression passes, the industries of the Region can recover to the position occupied in 1929, what will be the extent of the general surplus of labour in the Region as a whole, and how will this general surplus be distributed amongst the several industries? What are the characteristics and composition of the surplus in each industry affected? What factors have contributed to the appearance and persistence of the surplus? And, lastly, is it permissible to assume, in the case of the staple industries, that notwithstanding the events of 1930 and 1931 they are capable of recovering to the 1929 level of activity?

The General Problem.*

The actual volume of unemployment among the insured population in the Survey Region in 1929 is estimated to have been approximately 160,000 persons (or about 12 per cent. of the total insured population), consisting of about 120,000 males and 40,000 females. No allowance is made in this estimate for certain forms of unemployment among insured workers which are not reflected in the Ministry of Labour's statistics; and there is an indeterminate amount of unemployment in the uninsured occupations.

* See Part II, Chapter 2.

Unemployment among insured persons in 1929 was heavily concentrated in a few staple industries. Among males, cotton and the industries which are greatly dependent upon cotton—general engineering and textile finishing—and coal mining accounted for 52 per cent. of the total unemployment in all industries; while 69 per cent. of the unemployment among insured females occurred in cotton and textile finishing. Cotton alone was responsible for 17 per cent. of the total unemployed males and 66 per cent. of the total unemployed females. It is worthy of note, however, that over 40 per cent. of the total unemployment was distributed among trades other than the four mentioned above, and that of these only two—building and distribution—contributed more than 5 per cent. each.

The territorial distribution of unemployment was fairly even, although the rate of unemployment varied considerably from one part of the Region to another. Two outstanding facts emerge. First, no less than one-fifth of the total unemployment was centred in the cotton weaving belt which lies to the north and north-east of industrial Lancashire and contains the great centres of Burnley, Blackburn, and Preston, and numerous towns and villages surrounding them. The problem presented by this more or less stagnant pool of surplus labour in a highly specialised industrial area is scrutinised from several angles in the course of this Report. Second, the Manchester area, by reason mainly of its large population, was carrying about one-fifth of the unemployment in the Region.

The true significance of the foregoing account of the extent and distribution of unemployment can be more fully realised if the unemployment situation be viewed in relation to the size, constitution and movements of the population in the post-war period.

Between 1921 and 1931, the population of the Region increased by about 80,000 (or a little under 2 per cent. of the 1921 total), the increase being shared almost equally between males and females. There is reason to believe that, owing to changes which have been taking place in the age distribution of the total population since 1921, the numbers available for employment have increased to a greater degree than the total population, and the statistics of the growth of the insured population in the Region since 1923, notwithstanding all the reservations which must be observed in using them, seem to support this conclusion. The insured population increased by at least 5 per cent. between 1923 and 1929, and it is estimated that an addition of about 40,000 males and 25,000 females to the insured population in this period can be attributed almost wholly to the growth in the volume of occupiable labour.

This expansion of the volume of labour available for employment as a result of the growth of population bears directly upon the problem of the normal post-war surplus of labour. Between 1923 and 1929, the employment capacity of the Region increased by nearly 9 per cent., and the unemployment position was certainly

less serious in 1929 than in 1923. But it is important to note that the position in 1929 was more serious than it would have been if, in addition to carrying the large surplus of labour which the post-war contraction of the staple trades of the Region had created, the Region had not been confronted with a steadily increasing volume of occupiable labour. The increase of about 65,000 in the insured population between 1923 and 1929, which is mainly attributable to the growth of the labour force, appears as over 40 per cent. of the total volume of unemployment in 1929. The increase in the insured population is a much larger percentage of the labour surplus in the case of females than in the case of males.

In view of the growth of the labour force in the Region and the existence of a surplus of about 160,000 in 1929, the low rate of migration of the population from Lancashire since 1921 is greatly to be deplored. Between 1921 and 1931, the natural increase in the population of the county (i.e., the excess of births over deaths) was 238,000 or 4.9 per cent. of the 1921 total; the net loss by migration amounted to 132,000 or 2.7 per cent.; so that the actual increase in population was 106,000 or 2.2 per cent. This failure of migration to make a substantial contribution to the draining away of the surplus of labour in Lancashire is in striking contrast with the relatively high rates of migration in the depressed areas of North-East England and South Wales. There is some slight indication that the rate of migration from Lancashire has been gathering speed in the last few years, but unfortunately this point cannot be clearly established. The only encouraging sign is that between 1921 and 1931 there has been an actual decline in population in most of those areas within the Survey Region, such as the Blackburn, Burnley, Wigan and Oldham districts, in which the rate of unemployment has been highest, whilst the population has on the whole been expanding most in those southern parts of the Region around and to the west of Manchester in which unemployment has been least severe. But, unfortunately, this change in the territorial distribution of the population within the Region has not yet proceeded far enough to afford noticeable relief to the most depressed districts, so great is the extent of their surplus.

The foregoing outline of the extent and distribution of the surplus of labour in 1929 and the factors bearing upon it implies that reductions in the surplus may conceivably come from at least three sources. Firstly, industrial activity in the Region may expand beyond the 1929 level. Secondly, the numbers of juveniles entering industry may diminish. Thirdly, the rate of migration of labour from the Region may increase. It has been shown above that, up to the present, the effect of migration has been lamentably small, and it cannot be looked to as an adequate remedy in the near future, even if it be encouraged by special schemes for organised transference of industrial workers. Greater importance attaches to the second method—a reduction in the numbers of juveniles entering industry. The numbers of children leaving school in each year are

a fairly exact index of the numbers becoming available for employment for the first time. Now, the numbers leaving schools in Lancashire showed a tendency to increase slightly up to the year 1928-29, but in 1929-30 and 1930-31 the numbers fell substantially because of the abnormally low birth-rate in the years following 1915. The consequent relief in the juvenile employment situation will, however, be of strictly limited duration, and it is likely that after 1934 the numbers of school-leavers will revert to the scale of the years prior to 1929 and will remain near to that level for several years. On the other hand, a substantial and permanent contribution would be made to the reduction of the surplus of labour in the Survey Region if the school-leaving age were raised. It has been estimated that the effect of raising the school-leaving age to 15 in the Region would be to cause an aggregate reduction of 50-60,000 in the numbers leaving school in the year in which the change was made and the following year. Any measure capable of effecting such a reduction in an area which has a surplus labour force of 160,000 certainly deserves to be seriously examined.

It has been found possible to make some assessment of the extent and nature of the normal post-war surplus of labour in respect of the following industries—cotton, coalmining, engineering and chemicals. These industries will now be considered in turn.

The Cotton Industry.*

The Extent of the Surplus.

If the 1929 position be taken as typical of the post-war condition of the cotton industry in the Survey Region, the "normal" surplus of insured persons as revealed by the Ministry of Labour's statistics of unemployment would be about 63,000, consisting of 21,000 males and 42,000 females. This estimate must be regarded as subject to several important qualifications:—

(a) No allowance has been made for the fact that the apparent volume of unemployment in the industry in 1929 was artificially inflated by the decline in the rate of "wastage" from insurance after 1927-28.

(b) The estimate naturally does not cover unemployment among the classes of cotton workers who are not within the Unemployment Insurance Scheme—in particular, juveniles 14-15, persons over 65, and non-manual workers above the £250 income limit. Attempts to allow for these forms of surplus would be highly speculative.

(c) There are certain forms of unemployment in the cotton industry which are not recorded by the Ministry's statistics, viz., short-time working in some, at any rate, of the many guises that it assumes in the several branches of the industry, and under-employment in the weaving section. The short-time working referred to occurs principally in the spinning section

* See Part II, Chapters 4 and 5.

and in the processes preparatory to weaving, such as winding, and in so far as the official statistics do not record it, they fail to indicate accurately both the *real* volume and the *real* course of unemployment.

While it appears to be impossible to measure the extent of unrecorded short-time, there is no doubt that it is unimportant as compared with the unrecorded under-employment which exists in the weaving section of the industry. In weaving, there is, in fact, a certain amount of short-time working, and some of it may take forms which are not recorded by the figures of "books lodged". But generally a weaving firm called upon to reduce output will adopt the alternative method of stopping a certain proportion of its looms and working the remainder full-time. This plan may involve the total unemployment of some of the weavers, but almost invariably its effect will be to reduce the number of looms which many weavers still at work are operating: in other words, to produce under-employment amongst the weavers who are retained. It is this kind of under-employment which is not reflected in the official unemployment statistics.

While it has not been possible to measure the extent of under-employment in the weaving section generally, it has been shown by reference to the results of two investigations in the Blackburn area that recorded unemployment which fails to reflect under-employment of weavers may give a very false impression of the *volume* and the *course* of unemployment in the industry. Moreover, there is no doubt that any estimate of surplus labour in the industry in 1929 which does not make allowance for this form of unrecorded unemployment will be much too low. For, although the practice of employing weavers with less than the normal number of looms has for a long time been adopted in Lancashire as a means of "spreading" employment during temporary spells of bad trade, its significance here is that its use has been widespread and prolonged in the post-war period and has tended to conceal the true gravity of the situation in the industry by maintaining a large body of under-employed persons in the industry. Clearly, then, the estimate of surplus falls short of the true surplus, but by how much, it is impossible to say. Perhaps, an addition of 10-15,000 to the previous figure would not be excessive.

The estimate of general surplus given above effectively serves the purpose of giving a crude, numerical assessment of the seriousness of the labour problems confronting the industry, but it is only by analysing the characteristics, composition and distribution of this general surplus and studying certain factors which bear upon it that the social consequences of the existence of the surplus and the intricacies of the task of draining away the surplus can be truly comprehended. In the first place, it need hardly be pointed out that the conception of a surplus of 63,000 unemployed workers is a purely abstract one. Actually, the personnel of the unemployed is constantly changing, and the "rate of turnover" may vary consider-

ably from one period to another. There is good reason to think, however, that the "rate of turnover" in the cotton industry has been high—higher, in fact, than in industry generally. For instance, it has been estimated that in four of the principal cotton areas, in which in the year 1930 the rate of unemployment was about 45 per cent., as many as 70 per cent. of the insured men and 85-90 per cent. of the insured women made claims for benefit at some time or other during the year ended 20th December, 1930.* A very high "rate of turnover" may be beneficial from one point of view, but undesirable from another. It means that few are exposed to the disastrous effects on morale and industrial skill of prolonged idleness, but at the same time it is less likely that the true extent of the permanent surplus will be realised and steps taken to combat it.

The Characteristics of the Surplus.

Coming now to the question of the constitution and distribution of the surplus in cotton, perhaps the most important feature is the preponderance of females over males. Throughout the post-war period there have been round about twice as many females as males unemployed. This is to be accounted for partly by the slightly higher rate of unemployment among females than among males, but mainly by the prevalence of female workers in the industry. In 1929, females constituted 64 per cent. of the insured population in cotton. The predominance of females is most pronounced in the weaving section, but the 1921 Census showed that there were more females than males even in the spinning section.

A leading characteristic of female labour in cotton is the continuance of women in employment after marriage. In 1921, 28 per cent. of the females occupied in textiles in the Lancashire industrial area were married. The available statistics of the marital distribution of unemployed females seem to indicate that there is a disproportionate incidence of unemployment upon married women. But this position may result from the operation of either or both of two influences: viz., first, some part of the unemployment among married women may be more apparent than real, due to numbers of them coming back into the industry after having dropped out of it for a period or staying in the industry later than was formerly customary; and second, there may be a tendency for married women to be displaced before men and single women. Unfortunately, no precise conclusions on the relative weight of these inter-connected influences can be drawn from the available information. Thus, the fact that, when counts have been taken, the percentage of "wholly unemployed" to "temporarily stopped" on the live register has been much higher for married women than for single seems to lend

* It is probable, however, that a higher percentage of the insured population in these areas was in regular employment, and a smaller percentage was constantly unemployed, in 1929 than in 1930. As the depression has deepened, more and more mills have closed down permanently and the workers attached to them have been rendered totally unemployed.

credence to both explanations, and some of the other evidence is susceptible of more than one interpretation. But the balance of evidence is, on the whole, in favour of the view that the first influence has been mainly responsible for the disproportionately heavy rate of unemployment among married women, and the general opinion of the managers of Exchanges in cotton areas is that there has been no pronounced tendency for married women to be displaced before men or single women. Whatever may be the truth of this issue, the existence of large numbers of unemployed married women follows inevitably from the established custom in the industry for women to continue in the labour force after marriage.

The age distribution of the surplus is a matter of vital consequence, since obviously it is closely related to the question of the effects of unemployment upon the morale and the industrial skill and employability of the worker and to the problem of getting rid of the surplus by absorption in other occupations. Such information as has been obtained in respect of the cotton industry is not very conclusive, but, so far as it goes, it is disturbing. In the first place, unfortunately, little is known about the incidence of unemployment upon workers who are in those extremely important years 14-15, in which normally the cotton worker receives instruction in his occupation. Of unemployment among those 16-17 years of age, a little more is known. The Ministry of Labour's statistics at first sight suggest that the rate of unemployment is much lower among boys and girls 16-17 than among men and women, but it is known that a considerable, but indeterminate, number of juveniles do not register at the Exchanges or Bureaux when out of work. Yet, even if allowance were made for this incompleteness of the official figures, the rate of unemployment would probably still be lower among juveniles than among adults.

With regard to workers above 18 years, the most important fact is the alarmingly high numbers and percentage of workers unemployed in the 18-24 year age group. Enquiries by the Ministry of Labour in April, 1927, and February, 1931, revealed that in both years, in actual numbers, this age group accounted for over a quarter of the total unemployed males and females, and the rate of unemployment was higher in this age group than in the total insured population aged 16-64 years, except in the case of females in the later year. This heavy incidence of unemployment upon workers during a period in their working lives when they should be rapidly approaching maturity of industrial skill and adaptability and when they should be most capable of moving into other industries or localities is extremely disquieting, and the causes of it merit examination.

It should be noted that this same characteristic of the age distribution of the unemployed appears throughout industry, which suggests that certain *general* causes are in operation. Thus, it may be that, since the workers who are under the age of 24 will have

entered industry since the end of the War, many of them have been impeded by prolonged trade depression and intermittent employment from attaining the level of industrial skill commensurate with their age. Then, again, the very fact that a high proportion of the insured population in industry generally falls into the 18-24 year age group may account partly for the large numbers unemployed in that age group. In addition, certain *special* causes seem to have been at work in the cotton industry. Both in spinning and in weaving, the continued entry of juvenile labour into an already over-crowded industry in the last decade has tended to produce a "banking-up" of young adult workers at ages at which normally they would have been promoted to more responsible tasks yielding higher remuneration as vacancies arose.

Information relating to the occupational and territorial distribution of the surplus in cotton in the Survey Region is sufficiently complete to yield several important clear-cut conclusions as to the relative importance of unemployment in the different groups of occupations and the different cotton areas. Firstly, regarding the distribution of unemployment between the four main groups of occupations (comprising in each group, operatives and labourers), the following generalisations may be made. Among unemployed males, nearly one-tenth are registered for card and blowing room occupations, about one-half for spinning, a little more than one-tenth for winding, warping and beaming (processes preparatory to weaving), and about one-third for weaving. Among unemployed females, the corresponding distribution is as follows—about one-fifth, rather less than one-fifth, a quarter, and two-fifths. In other words, among card and blowing room workers, less than one-fifth of the unemployed are males, in spinning around one-half, in winding, warping, and beaming less than one-fifth, and in weaving rather more than one-fifth. Further, if the distinction made by the Ministry of Labour between "operatives" and "labourers" be accepted as broadly distinguishing skilled and unskilled workers, or at any rate, workers who have and workers who have not had specialised industrial training, it would appear that the vast majority of unemployed cotton workers over the age of 18 years are skilled. The proportion of skilled is smaller among men than among women, but broadly it seems that 80 per cent. at least of the unemployed have received a specialised occupational training.

Secondly, the geographical distribution of the surplus bears certain striking features. A large proportion of the surplus is concentrated in two areas—firstly, in the eastern parts of the Region around Oldham and Stalybridge, and secondly, in the cotton weaving belt which extends from Preston eastward to Colne with a branch reaching southward to Bacup and the Rossendale district. The second area presents the most serious problems. Between one-quarter and one-third of the surplus is found in the region which contains most of the principal weaving centres—Blackburn, Darwen,

Accrington, Burnley, Nelson and Colne and a very large number of smaller towns and villages. These towns and villages are mainly dependent upon cotton,* and unemployment, particularly among females, in the last decade has been aggravated by the lack of alternative occupations in other industries in the vicinity. The plight of the larger centres, removed as they are from the parts of the county in which industry is expanding, is sufficiently grave; but their position is not so alarming as that of the villages, many of which are entirely dependent upon the employment provided by one or two weaving mills.

The Inflow and Outflow of Labour.

It remains now to consider to what extent the relative speeds at which labour flowed into and out of the cotton industry in the last decade affected the size of the labour surplus in 1929. In the first place, it is clear that up to 1929 the numbers entering the industry had not fallen to the extent which would have brought substantial relief to the employment position of the adult workers. In the absence of any organised effort on the part of the industry or the State to control the flow of juveniles into the industry, very large numbers were not deterred from entering by the heavy unemployment and restricted earnings of adults. Even in 1929-30, when the number of insured persons in the industry was 470,000, over 19,000 juveniles (i.e., those between 16 and 18 years) entered insurance for the first time, and of these nearly 13,000 were girls. The average number of juvenile entrants in the years 1923-24 to 1929-30 was 22,500 per annum, and between 1923-24 and 1929-30 cotton's share of the total new entrants into insurance in all industries in the North-Western Division only fell from 17 per cent. to 13 per cent. in the case of boys and from 36 per cent. to 28 per cent. in the case of girls. Indeed, in certain parts of the Region, where cotton is the predominant industry—such as Oldham, Chadderton, Bolton and Blackburn—round about one-half of the children leaving school appears to have entered the cotton industry even in 1929-30.

It may be that, in the earlier years of the last decade, many entered the industry who imagined that the existing surplus would be merely transitory, but there is no doubt that in recent years large numbers have entered who were reluctant to do so but saw no hope of finding employment in other industries in the cotton towns. The consequences of such uncontrolled recruitment of young labour have been noted above: the "banking-up" of young adults, with insufficient industrial experience and training and with records of semi-casual and intermittent employment, at ages when they should normally have been obtaining promotion to work of greater responsibility yielding higher remuneration. In order that the

* See Part II, Chapter 4, which shows the predominance of cotton over other industries in these districts.

problem of surplus labour should not be aggravated by this influence in the future, it is desirable that active measures should be taken to regulate the process of recruiting young labour for the cotton industry in all districts. As a first step, it would be necessary to put an end to the present chaotic position, in which it is not known from year to year how many are entering the industry at the age of 14, or how those who do enter fare during their early working years, and to this end, the sphere of activity of the Juvenile Employment Bureaux and other machinery of a similar character might be usefully extended so that the industrial history of juvenile workers might be traced in detail. Work of this kind would prepare the ground for carrying through the more difficult but vital task of regulating entry, and of avoiding virtually blind-alley occupations. A subsidiary, but none the less desirable, object might be to attempt to secure to every entrant the advantage of a sufficient period of skilled instruction in his occupation.

The reaction of the immobility of the labour force attached to the cotton industry upon the size of the labour surplus in 1929 is no less important than the influence last considered. The principal factors bearing upon this immobility are the character of the labour force and its relations with employers; its territorial distribution; the prevalence of the family income and its implications; and the concealment of the real gravity of the problem of labour surplus by widespread short-time working and under-employment. The obstacles created by these and other forces have seriously impeded voluntary, unassisted movement: while the third factor mentioned, in particular, may have had the effect of creating a false impression in the minds of cotton workers and of the community as a whole as to the power of the cotton industry and cotton districts to work out their own salvation. There is no means of judging whether organised transfer of labour from the cotton areas might have been successful in overcoming the impediments to mobility in the relatively good years before 1930, for facilities under the Industrial Transference Scheme for transfer of workers from depressed industrial regions were not extended to Lancashire cotton areas until June, 1930, and the relative ineffectiveness of the Scheme in operation since that date is not conclusive evidence that the Scheme would not have worked with success in the better years. But, in our opinion, certain of the above-mentioned obstacles—such as the prevalence of the family income, the preponderance of female labour, the custom of women workers to continue in the labour force after marriage, the heavy concentration of unemployment in relatively isolated parts of the Survey Region, and the reluctance of workers to recognise the existence of a permanent surplus—will prove to be so difficult to overcome that organised efforts to transfer labour are not likely to meet with much success even when the present depression passes.

There are, however, two directions in which something might be done to clarify the position in, and introduce a greater degree of order into, the labour market. Firstly, the abolition of such short-time working and under-employment of labour as is the result of the existence of permanent surplus capacity of capital equipment and labour is desirable on economic grounds; above all, it would reveal the real extent of the labour surplus. At the present time, schemes are under consideration in the industry for the reduction of surplus capital equipment; such schemes, if carried into effect, should automatically reduce the amount of short-time and under-employment, but it is by no means clear that they would eliminate these practices. Secondly, every opportunity should be taken of securing that the burden of unemployment is distributed in the manner which will cause a minimum of loss or damage to the labour resources of the industry. So long as the displacement and recruitment of labour is unorganised, it is possible, for example, that elderly workers may find employment while young workers are idle, or that married women workers, whose husbands are in receipt of a satisfactory income, may be preferred to young married men with family obligations.

Technical Changes and the Demand for Labour.

It must be clearly understood that the above estimate of surplus is based upon the conditions existing in 1929, and that it is given to no one in a constantly changing world to know how far the cotton industry will be removed from the conditions of 1929 when it emerges at last from the present depression, so numerous are the incalculable factors, some within the control of the industry, others outside its control, which may affect its employment capacity in the next few years. In Chapter 4 of Part II of this Report, we attempt by simply enumerating the most obvious imponderables to exhibit the folly of trying to forecast future tendencies. A consideration of these imponderables, however, leads to the conclusion that the industry may find it very difficult to recover even to the 1929 level of capacity. Perhaps the most important of the influences which may modify the quantity of labour required in the industry in the near future and make recovery to the 1929 level difficult is the adoption of new machines and new technical methods in production and the re-organisation of manufacturing processes. While it is true that no appreciable part of the existing surplus of labour in the industry is attributable to such technical "rationalisation", there are signs that changes are impending which will radically increase physical output per person employed and consequently displace labour if aggregate output remains the same.

In Chapter 5 of Part II, we have examined in detail the probable effects upon the volume and character of labour required of the introduction of four new methods of production which are considered to present the most serious labour difficulties, namely:—
 (1) High draft spinning. (2) High speed winding and warping.

(3) The "more looms per weaver" system. (4) Automatic loom weaving.

1. *High draft spinning*.—The two main kinds of spinning—mule spinning and ring spinning—differ considerably in the nature of their technical processes and in the character of the labour they employ. Ring spinning provides work mainly for females, whereas mule spinning calls for both males and females in roughly equal numbers. In considering the effects of conversion from low draft spinning to high draft spinning, these differences between mule and ring spinning make it necessary to distinguish between three main kinds of conversion to high draft spinning. The most common types of conversion are (a) the scrapping of mule spindles and the installation of high draft ring spindles, and (b) the conversion of low draft ring spindles to high draft ring spinning. The third type—the conversion of low draft mule spindles to high draft mule spinning—has been rare in this country. All three types, and particularly the first, produce a substantial increase in physical output per head, and the following changes in the character of labour employed result. The first method almost entirely substitutes females for males in the spinning process, and may displace some females in the carding process which precedes spinning. The second and third methods likewise displace females in the cardroom.

An important indirect consequence of the change-over from mule spinning to high draft ring spinning would be to render necessary the installation of additional plant at or near the spinning mill for carrying out the processes of winding and warping, and to make redundant winding and warping plant already installed in weaving mills. With this technical re-arrangement would go a re-distribution of female winding and warping labour between the spinning and weaving sections.

The widespread adoption of high drafting would, it is clear, seriously reduce the demand for labour both in carding and spinning for a given output and modify the character of the labour employed. But the introduction of high drafting is likely to be very slow and the consequent changes in the volume and nature of labour required gradual, unless certain obstacles to the progress of high drafting are overcome. The principal obstacles at the present time are, first, the shortage of capital for effecting conversions to high drafting and installing additional winding and warping plant, and, second, the prevalence in Lancashire of mule spindles, which for certain classes of work possess advantages over the ring spindle, but which at present cannot be so successfully converted to high drafting as the ring spindle.

2. *High speed winding and warping*.—Since the War, marked progress has been made by engineers in the improvement of machinery for carrying out the processes of winding, warping and beaming, in which normally warp yarn is "prepared" for the weaving process. The most efficient of the new high speed

machines seriously reduce the demand for female labour for a given output of yarn and modify the nature of the labour required. But, high speed winding and warping, like high draft spinning, is not yet making much headway in practice, owing to shortage of capital and the existence of surplus plant of the older types, and it is safe to assume that the speed and extent of its introduction in the future will not be sufficient to cause serious and widespread displacement of female labour.

3. *The " more looms per weaver " system.*—The " more looms per weaver " system, unlike the two new methods of production referred to above, is likely to create very grave labour problems in the near future. In view of the numerous experiments which at present are being conducted with this system in one or other of its many forms, of the general uncertainty as to the practicability and consequences of embarking upon the system, and of the danger that the system will drift into use without due regard being had to the needs of the labour displaced, much attention has been devoted in Chapter 5 of Part II to the question of the economies of the system and the labour difficulties which it creates.

The reorganisation within a weaving shed which makes possible an increase in the number of looms which the weaver can tend has three leading features: first, the work of the weaver is mainly confined to the discharge of skilled duties at and for the loom; second, many subsidiary duties are transferred from the weaver to less skilled and cheaper labour; and third, a number of mechanical adjustments may be made to the loom for the purpose of assisting the weaver to supervise a greater number of looms.

The economies of this system have been a matter of interest to the industry during the last three years, but so slow has been the progress effected by negotiations between the employers' and the workers' organisations that the system is still passing through the experimental stage and data bearing upon the results of its adoption are scanty. But the following conclusions seem to be justified by the evidence which has been collected. The system brings about a decrease in production per loom, but an increase in production per weaver. The weekly earnings of the weaver are maintained or slightly increased, but weaving labour costs and total costs per unit of output fall. In the cases of the eight looms system investigated, the saving in weaving labour costs was 20-30 per cent. and the saving in total costs 2-7 per cent. The sample of firms and cloths woven was unfortunately very small, and obviously the extent of the saving will depend upon a large number of factors, such as the number of looms per weaver, the wage rates adopted, the type of cloth produced and the market price of yarn.

It will be evident that the reactions of the adoption of the " more looms per weaver " system upon the demand for labour will be determined by the speed and extent of its introduction, and this cannot be forecast. In the long run, the most important factor

governing the extent to which it is adopted will be the economies which accrue from it, and a further consideration will be the range of cloths which prove to be capable of being woven on a "more looms per weaver" system. It is certain that experiments with the system will gradually widen the field within which it is practicable and profitable, but even at the present stage of experiment the system is applicable to a wide range of cloths, woven in almost every part of the weaving section. Moreover, the savings to be effected in the weaving of cloths to which the system can be applied and the further factor that the savings are possible without substantial new capital expenditure will probably render the widespread introduction of the system inevitable. Already, as a result of the delay in concluding a "County" agreement between employers and workers, many firms have renounced the method of collective bargaining and have made independent "more looms" agreements with their operatives, and the number of such firms is steadily increasing. Recent events, therefore, indicate that the speed at which, and the extent to which, the change-over is made are likely to be such as to present considerable labour difficulties.

It is, of course, theoretically impossible to determine precisely the extent of the labour surplus which will result from the adoption of "more looms per weaver." But it is possible by hypothetical cases to show for a given output the volume of weaving labour displaced, and the number of additional workers required for unskilled subsidiary operations. For instance, it has been calculated that the adoption of the eight looms system in the weaving of cloths to which it has already been applied reduces the total volume of labour required by about 30 per cent.; whilst the volume of weaving labour falls by about 45 per cent. The order of magnitude of displacement may be better illustrated by the following estimate. Assuming 30,000 looms in the Burnley district (about one-third of the looms in place in that district) were turned over to the eight looms system in the weaving of "Printers" and using the above percentages, it appears that, out of 7,700 employed on the four looms system, 3,900 would be retained as weavers, and 1,300 would be allotted subsidiary duties, while 2,500 or about one-third of the total would become redundant. So long as the "more looms per weaver" system is adopted only by a small number of firms, it is probable that little or no permanent displacement will directly result, for the saving effected by those firms may enable them so to increase their sales and output at the expense of firms still working four looms to a weaver as to absorb the labour initially displaced by the adoption of the system. In the negotiations between employers and trade unions the problem of mitigating the effects of further additions to the surplus of labour in the weaving districts does not seem to have been scientifically examined. The first essential condition is undoubtedly that collective bargaining should be defended against the inclination of individual firms to break away from existing wages agreements.

But given collective bargaining, there is every reason why the introduction of the system should be planned as far as is practicable to yield security of employment to the workers who are retained and to regulate displacement so that the burden falls on those best able to bear it.

4. *Automatic loom weaving.*—The automatic loom has failed to make much headway in Lancashire, due to a number of factors which are by this time well understood, and as most of the factors are not likely to weaken in effect in the near future, it may reasonably be assumed that the advance of automatic weaving will not be an important influence making for displacement of labour. Where the automatic loom does supersede the non-automatic loom, the volume of labour rendered redundant will generally be much greater than in the case of the adoption of the six looms or eight looms system.

Coalmining.*

In all the important sections of the Lancashire coalfield—in the Wigan, Leigh, St. Helens, Burnley and Stalybridge districts—there has been a substantial decline in the volume of employment available since 1923. In Lancashire and Cheshire, employment fell from 112,000 in 1923 to around 68,000 in the period 1928-30. Low wages and uncertainty of employment have led workers to leave the industry in large numbers; and the numbers of juveniles entering have been small, with a tendency to decline further up to 1928-29. Much of the movement out of the industry has been unassisted, for the efforts exerted under the Industrial Transference Scheme to transfer miners from scheduled depressed areas in Lancashire have been attended with only moderate success, more than one-half of those who were moved between January, 1929, and March, 1930, having since returned home.

Since the numbers of insured persons leaving the industry have exceeded the numbers entering, the insured population in the industry in Lancashire and Cheshire has fallen from 117,000 in 1923 to 91,000 in 1930, and as a result of this decline, unemployment has not increased to the same extent as the volume of employment has fallen. Yet, the increase in the volume and rate of unemployment has been marked. In 1924, 6,000, or 5 per cent. of the total insured, were out of work, whereas in the years 1928-30 the figures were always above 20,000 (or 25 per cent.). These numbers exclude a small number of juvenile workers below the age of 16.

Some indication can be given of the constitution and distribution of this general surplus of 20,000 in the years 1928-30. The surplus consisted almost wholly of adult males (i.e., workers over the age of 18). There is no information as to the occupational distribution of the surplus in the same period, but the Ministry of Labour's classification of the unemployed between "skilled" and "unskilled" workers (a distinction used for placing purposes)

* See Chapter 7 of Part II.

in the period July-November, 1931, showed that about 60 per cent. of the unemployed were unskilled, and that the unskilled outnumbered the skilled among both surface and under-ground workers. The geographical distribution of the surplus is most clearly shown for the Survey Region. The rate of unemployment being roughly the same in every area, the great bulk of the surplus was to be found in the two largest areas—Wigan and Leigh. Wigan (with Hindley and Horwich) accounted for about 9,000; Leigh (with Farnworth, Pendlebury, Atherton and Tyldesley), for over 6,000. The shares of the other areas were St. Helens and Earlestown, 2,600; Burnley and Accrington, 1,400, and Stalybridge, Hyde, Ashton, Oldham, etc., 900.

In Chapter 7 of Part II of this Report, attention is directed to the question of the validity of the assumption that the years 1928-30 can be taken as indicating the level of activity at which the industry will be conducted in the future. There is a number of opposing factors to be taken into account. On the one hand, it must be set against the industry that output in the Lancashire and Cheshire coalfield has shown a substantial and continuous decline since 1875, whilst other coalfields have been expanding; that annual average output per person and output per man-shift are lower than in all other major coalfields; that costs are higher than in other fields and tend to show even more unfavourable comparisons with the passage of time; that losses have been large over long periods since 1927 and much larger than in rival coal-mining areas; and that the Lancashire and Cheshire coalfield is suffering from those weaknesses which attack all mining areas which are old. On the other hand, it has to be said in favour of the Lancashire field that large supplies of coal remain untapped; that it has a convenient home market in the neighbouring industrial area and can, in consequence, obtain a higher pit-head price than can other coalfields; that the formation of large combines may bring economies in production and distribution; and that the elimination of the weaker collieries will force up the general efficiency of the industry. Despite the fact that output per head is not likely to increase much through technical changes, the Lancashire and Cheshire coalfield will perhaps be fortunate if it can maintain the 1929 volume of employment.

In these circumstances, the problem of draining away a large surplus of adult workers from the industry in a relatively small number of towns situated mainly in South Lancashire demands serious attention.

cables, etc., (10,120); wire and wire netting (6,720); railway carriage construction (6,170); steel melting, iron puddling, etc., (6,100); and stoves, grates, pipes, etc., (5,490). Three of these branches—general engineering, wire and wire netting, steel melting and iron puddling—appear to be carrying a more or less permanent surplus of labour.

In *general engineering*, the numbers employed declined from 91,400 to 85,750 between 1923 and 1929, and although the efflux of large numbers of men from the industry in that period brought the numbers insured down from 120,000 to 101,000 and greatly relieved the situation, about 15,500 (or 15.5 per cent. of the total insured) were unemployed in 1929. The vast majority of this surplus was composed of adult male workers. Assuming that the industry will be able to recover to an employment capacity of 86,000 when the present depression passes, the need would arise for reducing the volume of labour attached to the industry by more than 15,000. In view, however, of the fact that unemployment was twice as heavy in 1930 as in 1929, the figure of 15,000 may prove to be a conservative estimate of the surplus.

It is not possible to show the distribution of the surplus between the several branches of the industry, but it seems certain that *textile engineering*, the most important branch, accounts for more than a proportionate share of the surplus. For it appears that those areas in the Survey Region in which textile engineering is most highly concentrated are bearing disproportionately large percentages of the total unemployment in the general engineering industry, while the converse is true of those areas which are devoted to other branches of the industry. Thus, in 1929, 20.1 per cent. of the total insured unemployed, but only 10.3 per cent. of the total insured employed were to be found in the Oldham area, whereas the Manchester and Trafford Park districts accounted for 43 per cent. of the employed but only 21.5 per cent. of the unemployed. In this characteristic, the Blackburn and Accrington area and the Bolton area resembled Oldham, and the St. Helens, Widnes and Warrington area resembled Manchester and Trafford Park. Almost every part of the Survey Region contributes substantially to the surplus, but in 1929, the foremost centres of depression were the Blackburn and Accrington area (with 21.9 per cent. of the total); the Oldham area (with 20.1 per cent.); the Manchester area (17.9 per cent.); and the Bolton area (13.2 per cent.).

There appears to be very little chance that textile engineering will expand much beyond its 1929 level. The depression in the cotton industry has robbed it of a large part of its home market and the surplus machine capacity of this industry has brought the price of second-hand machinery to a very low level. Export trade has dwindled because most cotton industries in the world are already over-equipped and because other countries, notably France, Germany and the United States, are providing a larger part of the total world exports of textile machinery. The Lancashire textile

engineering industry has not shown any marked attempt at diversification of its products since the end of the War. The merger which is at present being formed may improve conditions, but there is obviously a permanent surplus of labour in this industry which is all the more serious because it exists in the depressed cotton areas.

Compared with general engineering, the two metal trades which show a surplus of labour are of minor importance, but each should be mentioned because of its concentration in relatively small parts of the Survey Region. In terms of insured employed, three-fifths of the *wire and wire netting manufacture* were located in the Warrington, Widnes and St. Helens area in 1929, while in the same year, the same proportion of *steel melting, iron puddling, etc.*, was to be found in two areas—Warrington, Widnes, etc., and Wigan, Atherton, etc. Up to 1929, the total unemployed in the former industry kept steady at between 800 and 1,000, out of an insured population of 7,800, but in 1930, 2,000 were idle. Technical changes have tended to displace workers in this industry. In the case of steel melting, iron puddling, etc., the position has grown worse since 1923. Between 1923 and 1929, the numbers employed fell from 8,900 to 6,100 and the numbers insured from 10,700 to 8,700. In 1929, 2,600 were unemployed, almost one-third of this total occurring in the Wigan, Atherton, etc., district, where the rate of unemployment was 50 per cent.

The Chemical Industry.*

The south-west corner of the Survey Region—which includes the towns of Widnes, Runcorn, Warrington, St. Helens and Earlestown—possesses 40 per cent. of the chemical industry of the Region. In this area, the rate of unemployment in chemicals has not fallen below 9 per cent. since 1923; in 1923 it reached 18 per cent., in 1930, 19 per cent., and in 1931, 27 per cent. The numbers employed remained almost stationary between 1923 and 1929, and a slight reduction in the numbers of insured male workpeople attached to the industry brought some relief to the unemployment situation. But it is clear that before the 1930 slump there still existed a surplus of more than 10 per cent. of the insured workers. Conditions are not uniform throughout this area, for while employment seems to have been expanding in the chemical industry in Runcorn, the industry has been contracting in Widnes and St. Helens. The position in Widnes gives cause for some anxiety. Unemployment has greatly increased in 1930 and 1931, but some part of this increase appears to have been due not to the world depression but to the continued operation of causes, such as technological and structural changes, which accounted for the contraction of the industry in the earlier years. The employment capacity of the building and engineering trades which are closely associated with chemicals has been adversely affected, and it has been estimated

* See Part II, Chapter 9.

that Widnes now has a surplus of over 3,000 men, of whom less than 1,000 could be absorbed in the existing industries on their present scale, even if they were engaged at full capacity. In these circumstances it is desirable that the surplus should be drained either by the creation of new forms of employment within the Widnes area or by the voluntary movement of male labour into other areas.

Agriculture.*

In 1921 only about 2 per cent. of the total occupied population in Lancashire was engaged in agriculture, and, if one is to judge from the present trends, employment is not likely to increase. The numbers engaged in agriculture in the county have fallen at each census since 1901, and a similar decline has taken place in the total number of holdings. The total number of dairy cattle and sheep has been fairly stable in the past forty years. Since 1911 there has been a fall of 30,000 acres in arable land and the main crop, potatoes, has been seriously hit by an embargo placed upon exports because of the appearance of a disease. In addition, there has been a steady and considerable diminution of the area available for agriculture due to the encroachment of other industries, to absorption of farming land for residences for the growing population, and to the dismantling of farms in connection with the provision of water supplies. Only in one branch of agriculture, poultry keeping, in Lancashire is any expansion to be observed, the number of fowls having increased threefold between 1921 and 1930, but the increased employment provided cannot be stated.

CHAPTER 3.

THE EXPANDING INDUSTRIES AND OCCUPATIONS OF THE SURVEY REGION.

It has been suggested in Chapter 2 that the nature of the surplus labour in the Region and the experience of industrial transference schemes make it doubtful whether assisted migration from Lancashire can mitigate greatly the present problem. It is also argued there that the staple industries cannot, with much confidence, be expected to show a marked expansion beyond their 1929 position. The main relief, therefore, must be sought in the expansion of existing industries, other than the staple, and in the development of industries new to the area.

1. The Important Expanding Industries.

Whilst the staple industries of the Survey Region—cotton, textile engineering, coalmining, and textile finishing—have failed to recover ground since the end of the War, there are a number of industries and occupations of lesser importance which have steadily increased the numbers employed by them.

* See Part II, Chapter 12.

It is not usually understood how important is the employment provided by Local Authorities. A fairly complete return which has been obtained from such Authorities in the Region shows that the numbers employed increased from 77,000 in 1921 to 96,000 in 1930. Some part of this increase is undoubtedly due to the numerous relief schemes undertaken by such bodies and, at the moment, these schemes are being slowed down considerably. Despite this, Local Authorities are likely to continue to be employers of larger numbers of workers than the coalmining, the textile finishing or the clothing industry.*

As in most other parts of the country, the Distribution services are rapidly expanding in the Region.† The number of insured employed persons increased by nearly 30 per cent. between 1923 and 1931. In view of the prolonged industrial depression and the consequent decline in the purchasing power of the population, this increase is remarkable. A part of it must be attributed to the replacement of the "one-man" shop by the larger store, and the bringing into Unemployment Insurance of a higher proportion of those engaged in Distribution. But it also appears that distributive services are being rapidly, perhaps too rapidly, enlarged and diversified. Whilst the increased employment provided is encouraging, it is disturbing that it has gone along with increasing numbers, and an increasing percentage, of unemployed. The insured population is increasing more rapidly than the demand for labour. This, it appears, is due partly to administrative changes in the Unemployment Insurance Scheme which have led larger numbers of casual workers to continue registration at the Employment Exchanges; and partly to the increasing weekly and seasonal fluctuations in the demand for labour which are appearing in many branches of Distribution and tending to create more casual labour.

In the Electrical industries—Electrical Engineering; and Electric Cables, Wire, Flex, Lamps, etc.—the increase in employment has been large and continuous between 1923 and 1930, although some decline took place in 1931. Taken together, these two industries show an increase of 8,500 insured employed persons between 1923 and 1930; and this 40 per cent. expansion reveals their strength.‡

The rapid changes in methods of transport in the last decade have resulted in an almost threefold increase in insured employed persons in "Tram and Bus" between 1923 and 1931, from 7,020 to 20,100,§ an increase which far outstrips in rapidity that for the whole country and constitutes strong evidence of the improved transport facilities of the Region.

The Clothing industries, as a whole, have also shown development, although this has largely been confined to two sections, the

* See Part II, Chapter 13.

† See Part II, Chapter 10.

‡ See Part II, Chapter 6.

§ See Part II, Chapter 3.

manufacture of rainproofs and the manufacture of shirts and underclothing.* No detailed information is available of the expansion in the former but it is known to be very large. The numbers of insured employed in "Shirts and Underclothing" increased by 8,000 between 1923 and 1931, an expansion of 100 per cent., which might have been more rapid but for a shortage of labour in certain occupations.*

Many other similar examples of less important industries could be given. The numbers of insured employed increased, between 1923 and 1931, by 400 per cent. in Artificial Silk; by 350 per cent. in Artificial Stone; by 76 per cent. in Glass Bottle Manufacture; by 60 per cent. in Hosiery; by 55 per cent. in Laundries; by 40 per cent. in Bricks and Tiles; by 29 per cent. in Constructional Engineering; by 26 per cent. in Printing and Publishing; by 25 per cent. in Furniture; and by 17 per cent. in Wallpaper.

2. The Industrial Adaptability of the Region.

The growth of certain industries, since 1923, in the South of England, coinciding with some movement of insured population to that area, has led many to assume that northern districts, and particularly Lancashire, are rapidly declining in industrial importance, weakened by the dwindling of the staple industries and neglected by the newer.

The view that the Survey Region is not attracting the so-called "newer" and expanding industries is refuted by the fact that such industries have been growing as rapidly in the Region as in the whole of Great Britain. If the forty-two industries which expanded most rapidly in Great Britain and Northern Ireland be taken together,† the percentage increase in insured employed persons was about the same in the Survey Region as in Great Britain and Northern Ireland.

*Forty-Two "Expanding" Industries.
Insured Employed at June 1923, 29, 30 and 31 in Survey
Region and Great Britain and Northern Ireland.*

	Numbers.				1923=100.			
	1923.	1929.	1930.	1931.	1923.	1929.	1930.	1931.
Survey Region.	356,303	458,632	447,981	453,817	100	128·7	125·7	127·4
Gr. Britain and N. Ireland.	4,368,849	5,598,751	5,600,084	5,673,613	100	128·2	128·2	129·9

* See Part II, Chapter 8.

† Actually, this means all industries which showed at least a 10 per cent. increase in the number of insured employed persons in Great Britain and Northern Ireland between 1923 and 1929. See Part II, Chapter 3.

In total, these industries in the Region employed about 100,000 more insured persons in 1929, 1930 and 1931 than in 1923. Moreover, there are a number of industries (such as Brass and Copper, Cardboard Box Manufacture, Tanning and Currying) not included in the group above which show a much larger percentage increase of employment in the Survey Region than in Great Britain.

There are other indications of the industrial virility of the Region. The history of the boot and slipper industry of the Rossendale Valley provides an example of depression in a major industry being met by the establishment of a new, smaller industry. The boot and slipper industry, although established long before the War, is essentially the product of periods of depression in the cotton industry. Most of the factories now being used for making boots or shoes were originally cotton mills; many of these factories were turned over to the new type of production when times were hard in the cotton industry and the need for alternative forms of employment was urgent. It is true that in recent years the boot and shoe industry has experienced heavy unemployment, but even now it appears that a close measure of co-operation between the firms is mitigating the effects of depression.

The Survey Region also provides, in the case of the Trafford Park estate, near Manchester, one of the most remarkable illustrations in the country of the planned development of an entirely new industrial area, based on the abundant supply of labour in the district, and on the transport facilities of the Port of Manchester and its canal, railway, and road connections. More than 150 firms, many of them very large, and covering a wide range of activities, are now located there, employing 30-40,000 workers. Since the War, 64 new firms have taken sites and are now engaged in production, and, even in the past year, a number of new sites have been occupied.

It is not possible to maintain, therefore, that the Survey Region is not attracting "new" industries, for their growth has mitigated the effects of the depression in the staple industries. Certain less satisfactory aspects of the present position in the Region must not, however, be overlooked:—

(1) Although there are signs of growth and adaptability in the Survey Region as a whole, there are some areas which have not experienced such growth and which might be described without any straining of language, as threatening to become partially derelict. This is especially true of some of the weaving towns and villages in the north-east of the Region. They have in the past been almost wholly dependent upon cotton;* they lie some distance from the main centres of population in the county and off the main transport routes; and despite strenuous efforts they have not been successful in attracting many other industries since the end of the War. Whatever

* See Part II, Chapter 4.

results future efforts may have towards diversification of industries in these towns, it appears that this part of the Survey Region will never fully regain its former capacity for employment and will require to be dealt with by schemes for some labour transference.

(2) Whilst the electrification of the Survey Region is being pushed forward rapidly, and although the Region offers electric power for industry on terms which are not excelled in other parts of the country, an impression has been gained from a study of the electricity supply industry in the Region that the present organisation of the distribution of electricity is faulty at several points.* The completion of the "Grid" Scheme for the generation and transmission of electrical energy in the course of the next two or three years should bring about a satisfactory improvement in methods of production. But it seems certain that its success will be limited unless the distribution and "marketing" of electricity is subjected to a drastic measure of "regional planning" and unless all districts whole-heartedly embrace the most advanced expedients for stimulating industrial and domestic consumption. At the present time, the cost of distribution is too heavy in most districts; there is a lack of co-ordination between the numerous independent Supply Authorities in the determination of a selling policy; and industrial concerns and domestic consumers in some districts are labouring under a severe handicap by reason of the very great differences between the charges imposed by the various Authorities. There is scope for co-operation within the supply industry itself on the subject of distribution and, what is equally vital, for consultation between the supply industry as a whole and each important industry in the Region with a view to the scientific planning of the electrification of industrial plant as an essential condition of technical efficiency.

(3) Whatever alleviation in the labour market has resulted from the growth of the "newer" industries, this has not, and, at the present rate of growth, cannot wholly eliminate labour surplus in the Region. Two reasons may be given: (a) the "newer" industries started from very small beginnings in Lancashire after the War, and (b) measured in employment, the decline of the older industries has been much greater than the expansion of the newer. In 1929 the Survey Region contained 11.8 per cent. of the total insured population in Great Britain and Northern Ireland, 14 per cent. of the total insured employed in manufacturing industries, but only 8.2 per cent. of the insured employed in those industries which expanded more than 10 per cent. between 1923 and 1929. Lancashire, therefore, in the struggle for industrial

* See Part II, Chapter 11.

diversification had a bad starting position. Moreover, the increase of employment in the Region in those "expanding" industries between 1923 and 1929 amounted only to about 100,000, whilst the numbers of unemployed have never fallen much below 130,000.

(4) In 1930 and 1931, the forty-two "expanding" industries, referred to above, have shown a slight decline in the Survey Region which has no counterpart in the whole of Great Britain. This, however, may be attributed to the reactions on all industrial activity within the Region of the exceptionally severe depression in the cotton trade with its resultant effects on general purchasing power and consumption.

3. The Diversity of Industries in the Region.

Although the four aspects of the present position stated above are less satisfactory, they do not alter the general conclusion registered earlier, that smaller industries have been expanding in the Survey Region since 1923 and that the volume of employment available has been much increased in consequence. It would, indeed, have been extremely surprising if this growth had not taken place. The Survey Region is a highly concentrated area of industries of every kind.* In 1929, of the 101 industries in the Ministry of Labour classification, there were in the Region 58 "manufacturing" industries with more than 1,000 insured employed persons; 47 with more than 2,000; 34 with more than 5,000 and 15 with more than 10,000. This is in addition to the service industries engaged in transport and distribution of goods and the housing and amusement of the population. Twenty-six of these manufacturing industries contained at least 10 per cent. of the total insured employed persons in the corresponding national industry; and the Cotton, Glass, Glass Bottles, Wire and Wire Netting, Textile Finishing, Hats and Caps, Wallpaper and Rubber industries of the Survey Region each contained at least a quarter of the insured employed persons in the whole country.

It is, indeed, a mistake to attach too great importance to the part played in the Region by the staple industries—cotton, coalmining and engineering—for, in 1929, these accounted for only 56 per cent. of the total insured employed persons. Taking the Region as a whole it is much more "balanced" industrially than is commonly realised, although its dependence upon export trade makes it vulnerable at one point.

Because the Region has for long been the home of almost every type of industry and because it is concerned with both home and export trade, it has developed unique facilities in catering for every type of industrial activity. Excellent railway, road transport, canal and shipping facilities; banking and financial services

* See Part II, Chapter 3.

organised to meet a vast volume of home and foreign trade; subsidiary industries catering for the general needs of manufacturers; industrial power provided at prices which compare favourably with those in other parts of the country—these are advantages that slow and steady growth alone bring, and there can be no doubt of the suitability of the area as a centre for industrial expansion. Beyond that, the vast population in the Region constitutes a large market sufficient in itself to provide a powerful attraction for industries, particularly those which have been brought into existence in the last decade by the appearance of new wants and changes in tastes and methods of living. There is, then, little cause for surprise that, in the expansion of industries since the end of the War, the Region should have held its own.

4. The Alleged Handicaps of the Region.

Since there are, in fact, many smaller and expanding industries in Lancashire and since the county can give examples of areas developing perhaps as rapidly as any other in the country, it is only to be expected that many of the explanations which are put forward to account for Lancashire's inability to find new industries have to be regarded with caution.

(1) It is argued, for example, that local rates are so much higher in the Survey Region than in various parts of the South of England that industry inevitably gravitates southwards. An attempt has been made to examine this contention. It must be admitted that a statistical approach to this matter can never be conclusive because of the impossibility of allowing in any way for possible variations in bases of assessment in different parts of the country. From the information which has been obtained,* however, there can be no doubt at all that, since Derating, the advantages to be gained from lower rates by the movement of a factory from Lancashire to the South of England are small, and the actual reduction made possible in the total cost of production is infinitesimal. There are, indeed, a number of anomalies in the rating system which, whilst they have been mitigated by Derating and whilst they do not amount to a great deal in relation to total cost of production, act as irritants in areas suffering from heavy unemployment. The Survey Region has had to carry for a very long period the burden of the large amount of Public Assistance which Local Authorities have provided; and methods of determining the rates to be paid by industrial establishments when working short-time seem to require revision. But when every allowance has been made for such anomalies the broad conclusion still remains that local rates now normally constitute such a small proportion of the total selling value of products that they cannot possibly have any important effect upon the

* See Part II, Chapter 14.

localization of industry, unless business men are over-estimating the difference in the incidence of rates in different parts of the country.

(2) It is sometimes advanced that wages are so high in the Region that new industries are being kept away. It is not known upon what basis these statements are made. So far as it has been possible to determine it from a rough comparison of wage rates in a few occupations for which details are available, the Region is not at any disadvantage. Moreover, crude comparisons of wage rates are almost meaningless in this connection. An employer is concerned only with labour cost per unit of output, and, in this, the quality of the labour has to be taken into account along with the wages to be paid. Many private industrialists and public officials, who have dealt with labour in many parts of the country, affirm that, for industrial intelligence and application, the quality of the workers in the Region is always equal to, and often above, that found elsewhere. Sometimes, the "high wage" criticism takes the form that wages are so high in the cotton industry that it is almost impossible to obtain labour for other smaller industries which pay lower wages. But, it must not be overlooked that even if wage rates in the cotton industry be regarded as high, in relation to 1913 levels, the weekly earnings of many cotton operatives are seriously reduced by short-time or under-employment. It is hardly open to doubt that if other industries could offer full-time employment to cotton operatives in such towns as Burnley or Blackburn there would be no lack of applicants for employment at lower wages than could be earned on full-time employment in cotton.

(3) There is the argument that, apart from economic factors, Lancashire does not provide so attractive an environment for employers and employees in the working and leisure hours as certain parts of the South. This ignores the fact that the Lancashire industrial area is by no means completely built up. The south-western, western and northern parts of the Survey Region contain extensive tracts of land which are generously endowed with natural amenities and already are easily accessible by road and rail. Areas such as the semi-rural Wythenshawe estate, where Manchester is to build a satellite town, or the lower reaches of the Ribble Valley, are admirably suited for the establishment of light industries, and the application of modern ideas of factory lay-out. A further consideration often lost sight of by those who favour the development of industry in, say, the newer districts of Greater London, is that the traffic problem is much less acute in Lancashire; there is less congestion at the ports, and on the arterial roads. Moreover, the labour supply is likely to be found much nearer the factory, and the fatigue incurred in travelling presses less heavily on the worker. An expansion of new industrial territory in the Region, with its fixed equipment for industrial and residential purposes, would only be justified if it were clearly established that certain existing towns

and villages in the north-east and east cannot be preserved from depopulation and industrial decay. It is, however, patently incorrect to regard the whole of Lancashire as highly industrialised.

(4) It is suggested that labour is difficult to handle in the Region as the trade unions are strong and reactionary. This is largely a false conclusion drawn from the cotton industry with its rather set traditions. It does not appear that as between industries which are common to this Region and to other parts of the country there is much difference in the attitude of labour or in the character of trade union policy, so far as this is an influential factor. In many of the newer trades, even in districts with an old trade union tradition, labour organisation is weak. In those in which collective bargaining is on a national scale, or which fall under Trade Board regulation, the local divergences are hardly likely to be great.

5.—The Possibility of More Rapid Growth in the Expanding Industries.

Two facts emerge clearly from the preceding discussion: the growth of the smaller industries in the Survey Region has considerably improved the labour position, and yet that growth has not been rapid or large enough to absorb the surplus created by the decline of the staple industries. It is pertinent to ask, therefore, whether the expansion of the smaller industries can in any way be hastened.

In this connection the position in certain branches of the clothing industry* merits particular attention. Some branches have expanded considerably in the last eight years, but it appears that potential expansion is being held in check by the shortage of skilled female machinists. In a period of widespread unemployment this is a remarkable fact and it seems to be due to a number of combining elements. The clothing industry is concentrated almost wholly in Manchester, whilst the great bulk of surplus female labour is found in the northern weaving towns. Within Manchester, entry to the machining occupation is retarded by the seasonal nature of some of the trades; by a disinclination on the part of women to take up factory work, and by the rival attraction of clerical work. Great skill is required of machinists and it is difficult to train older persons. Moreover, the transfer of women from one occupation to another within the clothing industry is hampered by the rapidly increasing specialisation of processes; the operation of the Unemployment Insurance Scheme; and the present system of wage payment under the Trade Boards.

Some of these difficulties might be lessened. If it were possible to modify Trade Board rates in ways which are detailed elsewhere,* the flow of new entrants into machining might be stimulated and transference from one process to another in the industry

* See Part II, Chapter 8.

made easier. The unemployment which comes from increasing specialisation could perhaps be reduced if a wider training were given to machinists either under a scheme organised by the industry itself or by provision of technical education in Day or Evening Schools. The seasonal nature of demand in the industry might be met by a better organisation of the large amount of casual labour which is connected with it. Finally, if methods could be devised of encouraging the growth of the clothing industry in other parts of the Survey Region, particularly the northern weaving towns, some of the difficulties mentioned would probably be avoided and a direct attack made upon unemployment where it is heaviest. In the Blackburn, Burnley, Nelson and Colne area there is a plentiful supply of female labour which has no prejudice against factory work and is trained in factory routine. Clothing manufacturers assert that there are very many advantages obtained from location in Manchester. They are near to the wholesale dealer, and since the manufacturer is expected to maintain stocks and to meet orders at very short notice, this is an important consideration at the moment in the localization of the industry. It seems hard to believe, however, that in those branches of the industry in which changes in fashion do not play an important part, as for example, underclothing, the drawbacks of other parts of the county for the production of clothing are so great as to offset the advantage of a plentiful supply of female labour.

Recently, the view that Lancashire should actively foster the setting up of new plants has taken tangible form in the creation of such bodies as the Lancashire Industrial Development Council, charged with the task of expanding and co-ordinating propaganda concerning the industrial conveniences of the county. From a national point of view, there are two obvious directions in which the creation of such Development Councils in many parts of the country might produce beneficial results. In the first place, through research and the dissemination of information not formerly known to business men in this country, they might produce a more economic localization of industry. The greater the care with which business men study the location of the new plants they establish, and the greater the volume of information available to them for comparing the relative economic advantages of different areas, the greater will be the chance that the national industrial lay-out will be the best conceivable. It cannot be determined, of course, how far industries are, at the moment, uneconomically localized, but it seems that there are weaknesses of this kind which might be repaired by the work of such Councils. Secondly, it is argued that these bodies might produce a net increase in industrial activity and employment by encouraging foreign producers to establish their plants in Great Britain, but the extent to which success is likely to be attained in this direction it is impossible to estimate.

It is obvious, however, that the effect of the work of a Development Council in any one region is restricted by the fact that it

must compete with all such Councils in other regions. Presumably, if all Councils were equal in strength, their combined efforts would leave the localization of industry the same and any increase in employment could come only from the foreign concerns which decided to set up plants in this country.

It becomes pertinent to enquire, therefore, whether such bodies can engage constructively in the work of lessening unemployment unless, in certain areas which call for exceptional treatment, they are aided by special facilities for industrial expansion. Would it be expedient to attempt to deal with surplus labour not by transferring labour but by stimulating industrial expansion in the localities where the surplus is greatest and has proved most difficult to eradicate?

Such a policy, with all its difficulties, only merits consideration if transference of labour is considered inadequate and if local unemployment problems are of particular urgency. It would imply that certain parts of the country might benefit at the expense of others and that authoritative decisions would have to be made of the areas which, for the time being, should be made attractive for the "entrepreneur." It would involve some measure of national control over the location of industries in which considerations other than those which are usually entertained would carry weight.

Whilst it would be outside the scope of this Survey to discuss the general principles of some such scheme of national industrial planning, the investigations which have been carried out in the Survey Region point to the following broad conclusions:—

(1) It would be necessary to enquire, in the first place, whether a policy tending towards the equalising of unemployment throughout the country is economically desirable, or, to put it in concrete terms, whether on the whole it would be preferable to have 12 per cent. unemployment in one area and 6 per cent. in another, or 9 per cent. in each. There are a number of points which weigh in favour of the equalisation policy:—

(a) There are large areas in Lancashire which contain substantial surplus industrial population. Unless the staple industries in these areas expand beyond the 1929 level, which is unlikely, or unless Industrial Transference in the future is much more successful than it has been in the past, which is doubtful, it appears likely that the surplus will be permanent. If, therefore, the desirability of moving industry from one part of the country to another is ruled out, this amounts to the acceptance of conditions which will result in the slow degradation of large numbers of workers who, under happier circumstances, have shown themselves capable contributors to the national income.

(b) A very heavy rate of unemployment has serious reactions, not met with where unemployment is appreciable but not grave. In the first place, intense depression usually leads to permanent unemployment, with all its particularly demoralizing effects on mind and body. On this account it is perhaps fortunate that there has been short-time working and under-employment in the cotton industry, for it has helped to maintain industrial skill and individual independence, which are rapidly destroyed by continuous unemployment. Secondly, heavy unemployment, by making it impossible for the majority of younger persons to obtain adequate industrial training, strikes at the future efficiency, discipline, and balance of the industrial community. This is particularly the case in the main cotton areas, where the young people continue to crowd into an industry which offers them little chance of continuous training or employment. Thirdly, the absence of alternative employment weakens the power of Employment Exchanges in their placing work, and, by consequently eliminating the possibility of testing the willingness of the unemployed to accept work, tends to swell unduly the numbers receiving unemployment insurance benefit, to open the way for abuses, and to place a discount, in the minds of many, upon an honest search for work and self-reliance.

(2) It would be absurd to suggest that steps should be taken to keep any industrial area in existence which was patently unfitted for survival. But that cannot be said of the Survey Region. In the past ten years reconstruction has continued in the provision of power and transport facilities which could hardly have been more rapid even if the area had enjoyed a period of general prosperity. Under the "Grid" Scheme the co-ordination of electricity supply undertakings has been pushed forward rapidly; many Class I and Class II roads have been constructed or reconstructed since 1918. New houses have been built in all districts in the same period; the capital construction undertaken by County Boroughs is indicated by the fact that their net outstanding loan debt increased by over £40,000,000 between 1920 and 1929.

In consequence, it may seriously be questioned whether it will pay the nation in the future to allow the accumulation of capital invested in the Region in the form of factories, machines, roads, railways, power stations, buildings and houses to fall into disuse and to permit the duplication of this equipment elsewhere. Such items in the broad social profit and loss account can be described but cannot be measured, and the final balance which is struck is apt to be coloured by personal or local prejudice, but it is at least obvious that what may pay,

or seem to pay, an employer in establishing his factories in some formerly non-industrialized area does not necessarily justify such action when broader social considerations are taken into account.

(3) Finally, it appears that the present movements of British industry are duplicating industrial labour as well as capital equipment. It is impossible to be certain on this point, but what evidence there is suggests* that the growth of industries in the South-East of England is drawing into industry large numbers of people, particularly women, who formerly did not contemplate working outside the home. If this is the case, it must prolong the present maladjustment and disorganisation in the national labour market and make it more difficult for existing pools of surplus labour to be drained.

Many objections could be advanced against the policy under discussion. It would probably be argued that the present geographical lay-out of national industry is that which business men have found to be most efficient and that, in consequence, any attempt to change this arrangement would lead to a decrease in efficiency. But it is far from certain that a change in the location of many industries would necessarily have this result. Whilst there are certain forces—climate, accessibility to raw materials, power, labour or markets—which undoubtedly exert a long-term influence upon the location of industries, the degree to which those setting up new plants can assess the relative advantages of different areas is often so small that it is practicable for them to choose any one of a number of sites in different parts of the country. This conclusion is supported by the experience of Development Councils in recent months. Business men contemplating the establishment of a new plant make enquiries in widely distant parts of the country. Any important industrial locality would probably suit them, and the final choice seems often to turn upon small personal factors of no economic significance. It has to be admitted, of course, that where an industry is highly concentrated, new firms would inevitably be tied to the old location. Outside these cases, however, a substantial re-distribution of British industry could probably go on without any adverse effects being felt.

Secondly, it might be advanced that the proposed policy would confer privileges upon one part of the country as against another and mete out unequal treatment to industrialists. Even so, the principle of differential treatment has already been accepted under the Industrial Transference Scheme, where special areas have been scheduled as "Depressed" by the State and funds made available for re-training and transference of surplus labour. Even if a privilege were conferred upon a special area, such as Lancashire, for industrial development, that area might well claim that this

* See Appendix 10.

relief was something in return for the heavy burdens which it had borne for many years in the form of Public Assistance to large numbers of unemployed, whose support might legitimately have been regarded as the concern of the whole nation.

Thirdly, it might be put forward that the suggested policy would constitute an unfair interference with private enterprise. It would, of course, amount to State intervention in a new field, but this would not involve any large departure from existing principles. Every town has bye-laws regulating the location of industrial plants within its boundaries and the system of planning is being carried into wider fields by Regional Committees. It is no revolution in principle for the State to undertake the same kind of planning in order to deal with the urgent problem of unemployment.

Fourthly, it could be advanced that, under present conditions, the only practicable method of encouraging industries to set up in one area as against others would take the form, directly or indirectly, of subsidising one part of the community at the expense of the rest, and that the dangers inherent in subsidies would be as great here as elsewhere. Clearly, it would be necessary to devise any privileges granted to special localities in a form which would bring the inevitable dangers to a minimum.

Fifthly, it must be repeated that this scheme pre-supposes that different parts of the country show varying degrees of prosperity. It would obviously be unsuitable to the conditions of 1930 and 1931.

Apart from direct subsidy, three methods suggest themselves, by which certain areas could be rendered more attractive to industrialists :—

(1) A relief in regard to local rates. It might be possible through a more flexible working of Derating to give special relief to the scheduled areas. There is no doubt that in its present form Derating has relieved large numbers of extremely prosperous firms of burdens which they could well afford to bear and which have made very little difference to their costs of production. Whilst it is true that the incidence of rates upon industry is usually over-emphasised, yet this item in costs undoubtedly has a psychological effect much greater than its real incidence merits. Moreover, there are many industrial areas which might legitimately consider that the burden of Public Assistance which they have had to bear has been unfairly heavy.

(2) Special schemes for the training of workers. It should, of course, be the task of every industry to bear the full burden of the cost of training workers. But there may be cases where, through the absence of co-ordination between employers, the supply of new recruits is less than is normally required. Such a position appears to exist in the clothing industry in the Survey

Region. In such cases it may be worth while for the local or central authorities to step in and remedy the defects of the system.

(3) Arrangements whereby capital could be obtained at low rates by those concerns which were helping to meet the problem of intense localised unemployment. Such a method would appear to require the establishment of specialised financial institutions different from any already in existence.

Whether or not schemes of this kind are expedient in principle or possible in practice, it is undoubtedly true that the conception of dealing with unemployment by attracting industries to the badly affected areas logically leads to them. The work of Development Councils will, otherwise, be partly wasted in internal competition between the different parts of the country. If, however, any plan of this nature were applied to Lancashire it seems that it would best be framed with special regard to the following aspects of the labour problem in the Region :—

(1) The special difficulties of the North-Eastern weaving towns and villages. The surplus labour here is predominantly among cotton workers and is largely female. It has already been pointed out how badly this area has been hit by the depression in cotton and textile engineering, how few alternative occupations are making themselves available, and how difficult industrial transference would be in this locality.

(2) The position of the coalmining areas.* It ought not to be impossible, when the present intense depression passes, to deal with this partly by short-distance labour transference to other industries within the county. At the same time, the setting up of alternative industries within the South Lancashire coalmining belt would greatly assist the rapid absorption of the labour surplus and bring relief to a number of extremely distressed Local Authorities.

(3) Any plan for industrial expansion should devote attention to the possibility of enlarging the clothing industry and expanding it geographically.

CHAPTER 4.

THE EVENTS OF 1930-1931.

The estimates of surplus labour which have been made in various parts of this Report relate to conditions in 1929. Since then, notable changes have taken place in the volume of unemployment which, in a sense, make these estimates out of date and render it necessary to await a favourable turn of affairs before experimenting with some of the methods which have been suggested elsewhere to deal with the normal post-war labour surplus.

* See Part II, Chapter 7.

The events of the years 1930 and 1931 can best be studied in two sections. From the beginning of 1930 to September, 1931, there was an almost continuous increase in unemployment in practically all industries in the Survey Region. From September, 1931, to the end of the year, conditions seem to have improved.

1. The Depression. 1930—September, 1931.

The world depression of 1930 and 1931 raised unemployment in the industries of the Survey Region to unequalled levels and completely obliterated those features of the labour market which had come to be regarded as normal to the post-war period. The unemployment of insured persons in the Region rose from 12 per cent. in 1929 to 31 per cent. in the fourth quarter of 1930 and reached a slightly higher peak in the third quarter of 1931.* Practically every industry was affected to some degree and the major industries were all seriously hit. The numbers of unemployed*, between 1929 and the third quarter of 1931, increased more than threefold in Cotton, Electrical Engineering, and Shirts and Underclothing; and more than doubled in Distribution, General Engineering, Textile Finishing, Tailoring, Printing, Chemicals and Rubber. The increase in unemployment in the cotton industry was of particular severity, for, although there was some slight recovery in the early part of 1931, in the third quarter of that year there were seven insured persons unemployed for every two who had been unemployed in 1929.

The result was that the problem of unemployment in the Survey Region changed its nature and became even more unmanageable. The decline in production in the cotton industry meant that Lancashire's unemployment problem was, more than ever, associated with the cotton industry. Whereas 35 per cent. of the total insured unemployed persons were, in 1929, in cotton, that proportion in subsequent quarters rose to 50 per cent.† At the same time, the heavy unemployment prevalent in most industries and all districts of Great Britain closed the doors to schemes such as Industrial Transference. As matters stood in September, 1931, there was little that could be done except to await the developments which would make clear what part of this new phase of depression was permanent and what temporary.

2. September—December, 1931.

The departure of this country from the gold standard in September was followed by a fall in the numbers unemployed in Great Britain, the North-Western Division showing a very noticeable improvement. The table below shows that the total Live Register in the Division recorded a drop of 136,000 between September 14th and December 14th.

* See Appendix 11, Tables I and II.

† Appendix 11, Table III.

TABLE I.

Total Live Register—North-Western Division, 1931.

	<i>Men.</i>	<i>Boys.</i>	<i>Women.</i>	<i>Girls.</i>	<i>Total.</i>
Sept. 14th	425,412	17,538	237,348	16,016	696,314
" 21st	424,577	17,423	230,987	15,936	688,923
" 28th	419,475	16,824	221,572	15,243	673,114
Oct. 5th	410,921	16,452	210,615	14,399	652,387
" 12th	406,010	16,086	207,091	13,743	642,930
" 19th	402,383	15,497	201,276	13,199	632,355
" 26th	406,172	15,687	195,548	12,826	630,233
Nov. 2nd	398,901	15,304	191,120	12,189	617,514
" 9th	396,432	15,348	181,363	11,608	604,751
" 16th	397,314	14,727	173,052	11,282	596,375
" 23rd	389,277	14,066	163,948	10,662	577,953
" 30th	389,085	13,870	158,296	10,150	571,401
Dec. 7th	391,043	13,795	153,730	9,939	568,507
" 14th	389,448	13,013	148,136	9,428	560,025

Unfortunately, this movement took place whilst the Unemployment Insurance Scheme was under modification as a result of the Anomalies Act and the National Economy Act, and the numbers on the Live Register must have been affected. What part of the reduction in the Register is due to the operation of these two Acts it is not possible to determine exactly.* Since neither of the Acts operated before October 26th the decline up to this date in the Live Register (66,000) would be due to improvement in trade. Since that date large numbers of persons have ceased to register because they have been disallowed benefit under the Anomalies Act or refused Transitional Payment as a result of the Means Test. It is known that, between October 26th and December 7th, 10,000 men and 8,000 women, whose claims were rejected by the Public Assistance Committees, failed to continue registration. What numbers have dropped out through the working of the Anomalies Act is not known, but they must be large. Thus, at the Employment Exchanges of Ashton-under-Lyne, Blackburn, Bolton, Darwen, Liverpool and Manchester alone, it appears that, in the month 27th October—23rd November, about 6,000 women, whose claims were disallowed under the Anomalies Regulations, failed to maintain registration.

It seems, therefore, that whilst there has been a substantial reduction in unemployment since September in the Lancashire industrial area, the improvement is much less than the figures of the Live Register would suggest.

There is evidence to suggest that, whilst most parts of Lancashire have benefited, almost the whole of the improvement is to be found in the cotton industry. The decline in the numbers unemployed in the cotton and textile finishing industries since

* The figures of unemployment published by the Ministry of Labour will not, until January, 1932, reflect the recent legislative changes. Nevertheless, the percentage unemployment in the cotton industry of Great Britain fell from 46 in September to 29 in November and 27 in December.

September has been remarkable; and, although the following figures are subject to the same limitations as those of the Live Register, there can be little doubt that trading conditions in this quarter have been much better. (Table II.) In the weaving section of the cotton industry also it appears that, along with a fall in recorded unemployment, there has been a marked reduction in the under-employment by which a weaver operates less than her normal complement of looms. (Table III.)

TABLE II.

Numbers of Persons Unemployed in the Lancashire Cotton and Textile Finishing Industries at 66 Employment Exchanges.

1931.		Cotton Industry.*	Finishing Industry.†
September	14th ...	219,953	19,924
"	21st ...	208,969	20,115
"	28th ...	193,310	18,355
October	5th ...	176,709	19,376
"	12th ...	172,681	18,463
"	19th ...	161,130	17,651
"	26th ...	158,718	16,932
November	2nd ...	147,252	17,725
"	9th ...	139,677	17,266
"	16th ...	134,394	16,436
"	23rd ...	129,706	14,703
"	30th ...	122,856	15,234
December	7th ...	120,106	15,301
"	14th ...	117,483	13,606
"	21st ...	112,294	12,375

* Operatives in Card and Blowing Room; Spinning; Beaming, Winding and Warping; Weaving.

† Operatives in Bleaching, Printing, Dyeing, Finishing and Making-up.

TABLE III.

*Percentage Unemployment which would have existed among Weavers in Blackburn if Looms Running had all been operated by Weavers with Full Complement of Looms.**

1931.		
August	1st ...	32.3
August	29th ...	33.5
September	26th ...	30.1
October	31st ...	28.5
November	28th ...	18.9
December	26th ...	15.2

* For a description of the material embodied in this table, see p. 104.

It will be noticed that the reduction of numbers unemployed in cotton and textile finishing constitutes a very high proportion of the total reduction in the Live Register of the North-Western Division, suggesting that the expansion of trade in these industries is largely responsible for the encouraging improvement in the

Region. Further evidence in support of this is furnished by a special enquiry undertaken in 12* Employment Exchange areas in the Survey Region which showed that whereas the total number of persons unemployed fell by 52,067 between 21st September and 14th December, 1931, the reduction among those in the cotton industry† was 43,393, 83 per cent. of the total.

Whilst this turn of events in the Lancashire industrial area is much to be welcomed, it is necessary to see it in its right perspective.

1. The fall in unemployment since September still leaves the level much higher than it was in 1929. The number on the Live Register in the North-Western Division on 14th December, 1931, was still about 200,000 above that for the corresponding date of 1929. Unemployment in the cotton industry of Great Britain in December, 1931, was 27 per cent.‡ as against 14 per cent. for the corresponding month of 1929. Lancashire has much lee-way to make up even in the return to normal post-war conditions.

2. The improvement in the cotton industry should be viewed with caution. The monthly figures of the export of cotton piece goods have not yet shown any significant expansion. Whilst the departure from the gold standard undoubtedly gave some stimulus to export trade, the precarious nature of this advantage has been made evident by the similar step taken recently by Japan. It appears that Lancashire has been obtaining more trade in China, but this is generally attributed to the boycott of Japanese goods which may very well be temporary. There is, indeed, nothing in the minor boom of the last quarter of 1931 which should lead the industry to slacken the efforts which it has recently been making to restore stability and, by reducing costs, to hold or increase trade.

CHAPTER 5.

THE ECONOMIC AND SOCIAL STATISTICS OF THE SURVEY REGION.

It will be evident from the subject matter of this Report that statistical data of reliable character are indispensable to a proper study of the problems with which industrial Lancashire is now concerned. In the course of the Survey it has been necessary to rely largely upon such statistics relating to the Region as are already collected by public and private bodies, although, in some cases, such new data as could be rapidly compiled in the course of the Survey have been utilized.

* Bolton, Oldham, Rochdale, Burnley, Nelson, Colne, Blackburn, Preston, Darwen, Failsworth, Rawtenstall, Ashton-under-Lyne.

† In cardroom, spinning, winding, warping and weaving sections.

‡ It is only to be expected, however, that as cards in the "two months" file pass into the "dead" file this percentage will fall in the next few months.

Lancashire's difficulties are essentially of the type which calls for long-distance treatment and far-sighted planning, based upon intensive research of a continuing character, and the Survey has provided the opportunity for a critical examination of the existing statistical material and has revealed many serious gaps in the information which must be made available if continuous investigation is to yield the most useful results.

Statistics of the Central Authority.

The important suggestions relating to the collection of economic statistics made by the Committee on Finance and Industry (1931) will be supported by all those engaged in first-hand research into economic developments. The statistical work of the various State Departments is hampered in many cases by the fact that the collection of statistics is only incidental to other administrative duties. Whilst much information has been made available in this way, there is a strong case for compiling more frequently than at present statistical material the primary and chief value of which lies in its usefulness in the field of economic research. Increased funds devoted to the wider and more complete charting of the national economic system would be a sound investment, despite the urgent campaign for general economy.

During the course of the Survey, the force of the Macmillan Committee's plea for greater uniformity and comparability of the Regional statistics of the various Departments has been brought home strongly. In choosing the boundaries of the Survey Region we found it impossible to take any area which would enable us to use, on a comparable basis, the information provided by the Census of Production, the Census of Population, and the Unemployment statistics of the Ministry of Labour. If intensive studies of special industrial regions are to be carried out in the future, efforts should at once be made to establish uniformity in the Regional divisions chosen for the presentation of these three vital sources of information.

In particular, the appropriate Departments should be enabled to make the following changes in the method of collection or presentation of the statistics for which they are responsible :—

(a) There are numerous directions in which the work of the Board of Trade upon the Census of Production could profitably be extended :—

(i) The delay in publishing the results of the Census and the long interval between successive Censuses very much lessen their value. They should be more frequent (perhaps three-yearly) and the statistical departments concerned should be given facilities which would enable them to publish preliminary results within six months of the end of the period covered by the Census.

(ii) In view of the present industrial conditions in some areas, such as "Lancashire and parts of Cheshire and Derbyshire," the publication of the results of the 1930 Census for such areas should be expedited.

(iii) In future, the area " Lancashire and parts of Cheshire and Derbyshire " should not include, as it did in 1924, the counties of Cumberland and Westmorland.

(iv) An extension of the scope of the Census of Production to cover the distributive trades would throw a great deal of light upon one of the least understood branches of economic activity.

(v) The information which the Census amasses of the relation between production and exports for industries in the whole country should be extended to enable this relation to be determined by Regions. The relative importance of the home trade and the export trade in the main Lancashire industries is a question which is very obscure and one which merits a thorough scrutiny.

(vi) In future Censuses, a more detailed analysis might be made of the mechanical equipment in both the spinning and the weaving sections of the cotton industry. Important changes in the technical methods of production, through the introduction of high draft spinning, high speed warping and winding, and automatic loom weaving, are likely within the next decade and a start should be made in the measuring of them. It is also worthy of mention that the Census, has, as yet, provided no information of the quantity or nature of the equipment used in the processes—winding, beaming and warping—intermediate between spinning and weaving.

(b) It would be of great help in the continuous investigation of the Lancashire Survey Region, and presumably of other Regions presenting similar acute labour problems, if the preparation and publication of the material of the 1931 Census of Population could be hastened so that trends in population, industries and occupations in the last decade might be more clearly traced. It would also be of considerable help if, in addition, an industrial classification were given of occupied persons in the counties of Lancashire and Cheshire and in the local administrative areas within those counties. In the county volumes of the 1921 Census an occupational classification only was given.

(c) The great value of the Ministry of Labour's monthly figures of unemployment and its annual estimate of insured persons in 101 industries would be still further increased if the industrial list were extended and modified.

(i) The industry " Cotton " should be broken up into sections. What would be a practicable re-classification could, of course, be decided only by the Ministry but it seems that a distinction should be made between " Cotton Spinning," " Cotton Weaving " and " Cotton Winding, Warping and Beaming." The grouping together of these processes, as at present, obscures many important movements in each, and this will be particularly so if, in the future, the weaving section introduces new methods of production.

(ii) " Textile Engineering " might usefully be separated from " General Engineering." The problems of textile engineering in the Survey Region are peculiar and the industry is large enough to justify its being added to the present list.

(iii) The various clothing industries in the Ministry of Labour's classification cover many activities which cannot well be considered together. In particular, " Tailoring," includes retail and bespoke tailoring; raincoats; and waterproof manufacture—industries in the Region which vary widely in structure and trends. Sub-division here would be extremely useful.

Statistics of Local Authorities.

Local authorities are in a favourable position for collecting statistical data on many important economic problems and for undertaking those special social and economic investigations which can only be carried through adequately by persons possessing an intimate knowledge of local conditions and institutions. Already, many departments of municipal and public regional authorities in the Survey Region do make some use of their opportunities, even if they do not always publish their data regularly or keep records for the purpose of tracing long-period developments. But, broadly speaking, two factors prevent the social or economic investigator from making full use of the store of essential information which these authorities possess. In the first place, the statistics of each individual department of an authority are usually collected, recorded and disseminated by the department itself; rarely is it found that the statistical work of the several departments of an authority is co-ordinated by means of a statistical bureau, superintended by trained officials. This lack of organisation is sometimes accompanied by indifference to the importance of systematic and continuous statistical work, and there is reason for fearing that, in some districts, statistical enquiries will be among the first activities to be suspended or curtailed during a period of retrenchment. Secondly, the co-ordination of statistical work undertaken by public authorities throughout the country as a whole, or in defined regions within the country, is as yet very imperfect. A considerable volume of local data which if pooled and aggregated through regional or national "clearing-houses" would be extremely valuable, at present is accessible only to a limited local public and never crosses parochial boundaries. Much local data as it stands could not safely be aggregated because it is not collected in all areas in a standardised and comparable form. Certain instances may be cited. In the course of the Survey an attempt was made to obtain information from juvenile employment bureaux of the principal local authorities regarding the main industries entered by school-leavers. Of the authorities replying only seven or eight could supply a detailed industrial or occupational classification of entrants into industry; the years for which particulars could be given varied from one authority to another; no two authorities adopted the same classification of industries or occupations or the same methods of collecting the information. Another instance of unco-ordinated effort was found in the course of attempting to ascertain the amount of electricity supplied by authorised supply undertakings to the principal industries of the Region in recent years. It is impossible at the present time to give anything resembling a composite picture of the Region as a whole, because only six supply undertakings were able to make a detailed analysis of their industrial electric power sales in recent years. Moreover, the details for these undertakings are not usually published, and if they were published, could not safely be compared and aggregated since they are not based on a uniform industrial classification.

In order, therefore, that the valuable data in the hands of local authorities shall be fully mobilised, the following suggestion are made :—

(a) Each authority above a certain size (say, a population of 40,000), should be encouraged to establish a specialised department as a statistical and information bureau, whose functions should be to co-ordinate the statistical work undertaken by the several departments of the municipality and to make itself responsible for the keeping of records and publication of data and, where necessary, to carry through original local enquiries which might be delegated to it by the central authority. Regional statistical bureaux of this type are to be found in other countries, notably Italy and Germany, and apart from the special enquiries undertaken by them, their work is of great assistance to the Central Statistical Authority. Further, the necessary co-ordination of these local bureaux might be secured by setting up a central bureau for the whole country, or regional bureaux, each linking up the local bureaux in a defined region, such as Lancashire. The central or regional bureau might endeavour to procure the collection of data by the several local bureaux under its control on the standardised uniform basis which would be best suited to the needs of social and economic investigation. In its hands, statistics could be centralised. Nothing more than a rough outline of the nature of the structure, powers and duties of the proposed bureaux, or the relations between them and the established public statistical services, can be given here. But thorough consideration should be given to this proposal in view of the possibilities inherent in a more scientific treatment of local statistics.

(b) Apart from this long-distance suggestion, it is highly desirable that local authorities with their present resources should undertake certain work of immediate importance :

(1) It lies within the power of the local authorities of the Survey Region, through their Juvenile Employment Bureaux or otherwise, to ascertain year by year the number of school-leavers who enter each industry in their areas. As has been pointed out above, a few authorities already collect such information, but the results obviously cannot attain their highest value until every authority collects the information and, in doing so, adopts standard methods and a uniform classification of industries and occupations. These statistics would throw some light upon the employment of juveniles between leaving school and entering into Unemployment Insurance.*

* Increased information regarding the industries which children enter on leaving school would, of course, become available if, as is contemplated, the age of entry into Unemployment Insurance be reduced to 15 years when the school-leaving age is raised to this figure. This, however, appears very unlikely in the next few years, and meanwhile we are almost completely ignorant of one vital piece of information regarding the supply of labour—the industries being entered by the new supply of labour which the schools make available for industry each year.

(2) Local authorities might endeavour, by co-ordinated effort, to fill some of the serious gaps which now exist in the statistics of the electricity supply industry of the Survey Region. These gaps are referred to in detail in Chapter 11 of Part II of this Report. Local authority supply undertakers could do much to supplement the statistics published annually by the Electricity Commission and the results of the Census of Production, as, for instance, by analysing their power sales to industry in each year, and by ascertaining from time to time the amount of private electric generating plant and the degree of electrification of the industrial plant in their areas. Here, again, the adoption by all authorities of uniform methods of making such computations and analyses would enhance the value of the results.

(3) The enquiry which was made regarding the employment provided by Local Authorities and Joint Boards (see Part II, Chapter 13) produced such valuable results that this information should be kept up to date, collected on a comparable basis and published.

Private Industrial Statistics.

The statistics of output, sales, exports, output per head, etc., collected by industries themselves in the Survey Region are noticeably scarce. It was, perhaps, not to be expected that many industries not definitely localised in Lancashire would have information of this kind for this particular area. But, with one or two exceptions, even the industries highly concentrated in Lancashire pay little attention to composite statistics. In the majority of such cases, the Employers' Organisations do not pay sufficient regard to the collection of business statistics nor have they effective machinery for the conducting of original enquiries or a sufficient influence over their members to be sure of obtaining complete returns. In the case of most Trade Unions the position is similar. The result is that upon such vital matters as the flow of juvenile labour into industry or the probable reactions of technical changes upon the demand for labour, most industries are almost completely in the dark.

✓ In their own interests the industries of Lancashire, and above all the smaller and less well organised, should devote more attention to the collection of statistics :—

✓ (1) Employers' Organisations should devote resources to the setting up of departments similar to the Cotton Trade Statistical Bureau, in charge of trained statisticians.

(2) Trade Unions should establish statistical sections which might well devote themselves to the collection of data on such matters as short-time working and other forms of unrecorded unemployment; technical changes and the demand for labour; and the recruitment of labour into industry.

✓ (3) In the collection and dissemination of the material which would be collected by Trade Unions and Employers' Organisations, the closest collaboration should be maintained between the statistician and the technical expert. Many economic statistics are extremely misleading because of the lack of detailed technical knowledge on the part of the statistician. This co-operation would avoid the very elementary mistakes which are likely to be made through the use of averages and the broad generalisations for which the economist and the statistician constantly search.

PART II.

CHAPTER 1.

POPULATION AND INDUSTRY IN LANCASHIRE BEFORE 1921.

Most of the later chapters of this Survey will be concerned with the existing situation and with such changes as have taken place during the past ten years. The object of this preliminary chapter is to give a sketch of the chief trends of population, and especially of the occupied population, in Lancashire during the later decades of the nineteenth century and the first two decades of the twentieth century. Such a study may help to determine how far the problems that confront the county to-day are new, and how far they are deep-seated in the past. The statistical material available for pre-war years is generally of a character which does not allow of the isolation of the Survey Region from the rest of the county; and most of what will be said in this chapter will relate, therefore, to Lancashire as a whole.

I.

During the 120 years between the first census of 1801 and the fourteenth census of 1921 the population of the County Palatine increased more than sevenfold, while that of England and Wales increased little more than fourfold. In 1801 Lancashire held only 7.6 per cent. of the population of the country; in 1921 she held 13.0 per cent. This increase in the relative importance of Lancashire has not, however, been a continuous process. Between 1801 and 1891 the population of the county was growing more rapidly than that of the country as a whole; between 1891 and 1901 Lancashire just maintained her relative position; and since 1901 she has failed to hold her own as far as numbers are concerned.*

The increase in the population of any area may, of course, be due to either, or both, of two causes: an excess of births over deaths, or an excess of inward over outward migration. The first has operated in Lancashire throughout the period under consideration, the second only to 1901.† Whereas between 1891 and 1901 there was a net inflow of 40,951 persons to the Ancient County of Lancaster (an inflow equal to about 1.04 per cent. of the population in 1891), between 1901 and 1911 there was an outflow from the Administrative County of 97,191 persons (equal to about 2.2 per cent. of the population in 1901), and between 1911

* See Appendix 1, Table I.

† See Appendix 1, Table II.

and 1921 an outflow of 163,206 persons including war deaths which occurred outside of the county (equal to 3.4 per cent. of the population in 1911).*

During the nineteenth century important changes occurred in the distribution of population within the county. These were intimately connected with the growth or decline of particular industries, and, in the early part of the period, the rise and spread of cotton manufacture was the dominant factor. It is well known that this was first carried on mainly in the south-east corner of Lancashire, about Manchester. At first the various sections existed in close touch with one another. As the industry grew, however, the main processes, seeking scope for expansion, moved to the north and east. In particular, spinning and the preparatory processes spread along the valleys of the Irwell, the Irk, the Medlock and the Tame, and the manufacturing or weaving processes congregated about the Ribble and the Calder, as well as in the region of Rossendale.

The alterations made, from time to time, in the boundaries of registration areas make it exceedingly difficult to trace in detail the changes in the distribution of population. If, however, the areas selected for comparison are very large most of the transfers of population due to alteration of boundaries will be internal; and those from one area to another will form but a minute fraction of the population concerned. Thus it is possible to divide the greater part of the Survey Region into two parts, the boundaries of each of which have changed very little during the last seventy years. The one forms an arc of a circle to the north-east of Manchester; the other consists of the Manchester district itself, the districts about the middle Mersey, and a good deal of the central plain of Lancashire.† The one is very roughly coincident with the area in which cotton spinning and weaving are preponderant; the other covers the greater part of the coalfield and the centres where engineering, clothing, and merchanting are the dominant activities. Between them they include, throughout the period considered, approximately 70 per cent. of the population of the whole county, and therefore, a very much higher percentage of that of the Survey Region.

No attempt has been made to trace the magnitude of the population in these two areas for the first fifty years of the nineteenth century. But it seems probable that, in this period, the first was increasing quite as rapidly as the second. Of fifty-two leading

* Excluding war deaths the balance of outward migration was approximately 91,000 (or about 1.9 per cent. of the population in 1911).

† The first of these divisions consists of the registration districts of Preston, Blackburn, Burnley, Haslingden, Chorley, Bolton, Bury, Rochdale, Oldham and Ashton-under-Lyne; the second those of Wigan, Warrington, Leigh, Barton-upon-Irwell, Salford, Prestwich, Manchester and Chorlton. Together they cover the whole of the Survey Region with the exception of that included in the registration districts of Lunesdale, Lancaster, Garstang, Clitheroe, Fylde, Ormskirk, Prescott, and that part which falls within the counties of Cheshire and Derby.

towns in Lancashire and Cheshire seven registered their maximum increase between 1801 and 1811; but only two of these, Bolton (38 per cent. increase) and Colne (47 per cent. increase), were among what are now predominantly textile centres.* In the following decade, however, twelve towns reached their highest rate of increase; and, of these, six (Clitheroe 82 per cent., Burnley 52 per cent., Accrington 73 per cent., Haslingden 29 per cent., Over Darwen 52 per cent., and Blackburn 45 per cent.) were closely connected with cotton. Between 1821 and 1831, eighteen towns reached their peak of increase, and these included, besides Manchester (47 per cent.), eight important textile towns (Bury 42 per cent., Heywood 59 per cent., Rochdale 29 per cent., Oldham 49 per cent., Stalybridge 155 per cent., Hyde 113 per cent., Stockport 32 per cent., and Macclesfield 47 per cent.). Of the eight towns that showed their highest rate of increase between 1831 and 1841, five (Preston 50 per cent., Chorley 42 per cent., Radcliffe 31 per cent., Eccles 21 per cent. and Ashton-under-Lyne 38 per cent.) were cotton towns. And of the eight remaining towns the rate of growth of which culminated in the decade 1841 to 1851, two (Bacup 45 per cent., and Rawtenstall 42 per cent.) were connected with the staple industry of Lancashire.†

Broadly, it would appear that the weaving centres of the North expanded most rapidly between 1811 and 1821, the spinning centres of south-east Lancashire between 1821 and 1841, and the geographically intermediate area of the Rossendale Valley between 1841 and 1851. Throughout, however, the very high rates of increase of the leading textile centres suggest the probability that the first of the areas into which the Survey Region has been divided was growing in population more rapidly than the second.

This was true also of the decade 1851-1861, though the change of proportion was slight. Whereas in 1851 57.1 per cent. of the population was included in the registration districts of the North and East, in 1861 the percentage was 57.4. Thereafter the movement was steadily in the opposite direction: the percentage in the North and East showed a continuous decrease, as is shown by the following figures drawn from Table III, Appendix 1.

1861.	1871.	1881.	1891.	1901.	1911.	1921.
57.4	56.5	55.9	55.7	54.4	53.5	52.4

The decline in the importance of this part of the county was most marked in the periods 1861-71, 1891-1901, and 1911-21, each of

* If Leigh is counted among the textile towns the number must be raised to three. The high percentages of increase in this period are somewhat misleading. They are due to the very small population of the places in 1801; only one of the seven towns (Bolton) had, even in 1851, as many as ten thousand inhabitants.

† Danson and Welton: On the Population of Lancashire and Cheshire and its Local Distribution during the Fifty Years 1801-51. Trans. of the Historical Society of Lancashire and Cheshire, X, (1857-8).

which brought serious difficulties to the staple industry of Lancashire; for the first included the years of the Cotton Famine, the second the severe depression of the nineties, and the third the disaster of 1914-18. But the fact that even when the cotton industry was doing well the areas in which it is of prime importance were increasing less rapidly than others, suggests that, over the sixty years considered, cotton was playing a steadily smaller part in the economy of Lancashire.

In a later section it will be shown that the rise in the relative importance of what may, perhaps, be called Metropolitan Lancashire continued during the decade 1921-31. The process has thus persisted for seventy years and no signs of slackening are yet visible. The opening of the Manchester Ship Canal in 1894 brought a new range of industrial opportunities to the South and West of the Survey Region, and it is not surprising to find that, in the thirty years between 1891 and 1921, this area gained on that of the North and East at about double the pace of the preceding thirty years.

It is important to observe that until 1911 the decline of the North and East was not absolute, but was simply due to a slower growth of population in this area than in that of the South and West. Between 1911 and 1921, however, social anaemia had definitely set in: while the population of the South and West expanded by more than 40,000, that of the North and East showed an absolute decline of about 30,000 persons.

For the period between 1901 and 1921 it is worth considering the matter in somewhat closer detail. With this object the whole of the Survey Region (including the parts in Cheshire and Derbyshire) has been divided into thirteen districts, based on the Employment Exchange Areas. For simplicity the districts have been thrown into five main groups,* each of which may be described in terms of the dominant occupations. Of these the first covers broadly the weaving area of north-east Lancashire, the second the spinning area, the third the coal and chemicals area, the fourth the area of engineering, clothing, and other activities centring about Manchester,† and the fifth the holiday and residential area. It will be observed that the first two groups are broadly coincident with the region described as "North and East" in the previous table,‡ and the next two groups with that called "South and West",§ and that the secular trend already noticed is confirmed by these

* Appendix 1, Table IV.

† The Manchester district is, of course, also a cotton spinning and manufacturing centre. In 1921 there were 70 cotton firms, engaged in spinning, doubling and weaving in Manchester and Salford, and the number of textile workers in the two cities was 31,461.

‡ It includes, however, in the north, the areas covered by the registration districts of Lancaster and Lunesdale, and, in the south, parts of Cheshire and Derbyshire.

§ With the addition of the Prescot registration district in the west, and part of Cheshire in the south.

figures covering a wider area than those in Table III. If the last group (including Blackpool and Fleetwood) is excluded it will be seen that the percentage of the population in the region comprising the first two groups declined from 55.4 in 1901, to 54.4 in 1911, and to 53.5 in 1921.

Of the thirteen districts, that of Bacup, including the Rossendale Valley, is the only one that showed an absolute decline of population between 1901 and 1911; but in the following decade absolute declines were registered in all three districts—Bacup, Burnley and Blackburn—in the first group, as well as by the Bolton, Rochdale and Oldham districts in the second group. Of the districts that may be regarded as primarily concerned with textiles only those about Preston and Stalybridge showed an increase, and in both of these there are important metal and miscellaneous industries.*

Each of the remaining five districts, in none of which is the textile industry of prime importance, registered an increase of population in both decades. Between 1911 and 1921 growth was specially marked in the districts of St. Helens and Lancaster. In the former, Warrington increased its population by 6.4 per cent., St. Helens by 6.3 per cent., and Irlam by as much as 50.1 per cent.; while, in the latter, Blackpool and Fleetwood grew by 64.0 and 22.5 per cent. respectively.†

So far nothing has been said as to the manner in which the change in the geographical distribution of population came about. To what extent was it due to differences between areas in the natural rate of increase (excess of births over deaths) and to what extent to differences in the rate of migration?

For the earlier part of the period evidence is lacking, but the broad movements can be traced for the registration districts between 1891 and 1901 and 1901 and 1911. The figures are set forth in Appendix 1, Tables V and VI. In both decades there was an increase in the population of each of the eighteen registration districts, with the exception of Manchester. The exception is easy to understand, for large towns like Manchester reach at an early stage what has been called the point of saturation of population. The centre is required for business premises, warehouses and factories; slums and overcrowded houses are pulled down, and part of the population moves to residential areas outside the limits of the town. That the decrease was not due to falling prosperity is suggested by the rapid increase of population in both periods in

* Preston has actually far more weavers than spinners, and it might more appropriately have been put in the first group. But spinning is by no means negligible there, and the Census Authorities do not include the town among the weaving centres. Moreover the presence of a varied range of activities differentiates Preston from the places in the first group.

† The increase of Blackpool is, however, partly accounted for by an extension of boundaries during the intercensal period, and by the fact that the Census of 1921 was taken in June, when the holiday influx had already begun.

the neighbouring registration districts of Chorlton, Prestwich and Barton. Manchester workers have clearly followed the example of Manchester merchants of an earlier generation and have ceased to live in Manchester.

All registration districts show an excess of births over deaths, though the percentages vary considerably. But whereas some gained by migration others lost. Grouped together, those of the North and East lost by migration in both decades, while those of the South and West gained between 1891 and 1901, and lost between 1901 and 1911. But how small a part in altering the centre of gravity of population was played by emigrants, and how large a part by differences in the rates of natural increase in these periods is shown by the following percentages.

		1891-1901.		
		<i>Increase.</i>	<i>Natural Increase.</i>	<i>Gain (+) or loss (-) by migration.</i>
North and East	...	9.1	9.5	-0.4
South and West	...	14.7	12.9	+1.8
		1901-1911.		
North and East	...	6.7	8.4	-1.7
South and West	...	11.0	12.6	-1.6

In the following decade 1911-21 there is evidence of migration on a somewhat larger scale, but much of this must have been connected with the war. To determine its effect in altering the local distribution of the population, Table VII, Appendix 1, based on the Employment Exchange areas has been drawn up, and the results for the first four groups are shown below.*

Percentage Changes in Population, 1911-21.

Area.	Increase (+) or Decrease (-).	Natural Increase (+) or Decrease (-).	Gain (+) or loss (-) by migration.
Predominantly Weaving	-3.6	+ 3.4	-7.0
„ Spinning	+0.5	+ 5.0	-4.5
„ Coal and Chemicals	+3.8	+11.6	-7.8
„ Engineering and Dress.	+2.8	+ 7.4	-4.6
Aggregate ...	+1.1	+ 6.5	-5.4

In the Weaving area the decrease of population was due partly to an abnormally low rate of natural increase and partly to a high rate of outward migration. In the Spinning area where the

* Figures for the residential and holiday district covering Blackpool and Fleetwood show an increase of 33.1 per cent., accounted for by a natural increase of 3.3 per cent. and an inward migration of 29.8 per cent. But, as already mentioned, much of this inflow must have been merely of a seasonal character.

excess of births over deaths was also below the average the net outward migration was relatively slight and a fractional increase of population was recorded. In the Coal and Chemicals area, although the balance of outward migration was considerably higher than elsewhere in the Survey Region, so also was the excess of births over deaths, and the resultant was an increase of population above the average. The Engineering and Clothing area showed a relatively high rate of natural increase, and an outward migration rate below the average, so that, on balance, there was a more than average increase in population.

If the first two areas are taken together they exhibit a decrease of population of 0.6 per cent., accounted for by a natural increase of 4.6 per cent., less a net outflow of 5.2 per cent. The latter is slightly below that for the Region as a whole. It thus appears that, for the decade 1911-21, the decline of the North and East was due more to its low rate of natural increase than to migration from the area.

This relatively low rate of natural increase in the textile districts is no new phenomenon: it is reflected in the Census figures of the later decades of the nineteenth century. The cause does not lie in any deficiency of marriages, for the marriage rate is highest precisely in the textile districts. It is probably to be found in the fact that, in the textile areas, a woman's industrial career does not cease at marriage; and that married women in employment tend to have fewer children than do unoccupied women. It has been pointed out that, as early as 1881, births per 10,000 married women were lower in textile towns than in residential places, and very much lower than in colliery districts;* and Mr. D. Caradog Jones has shown that, in Lancashire, the birth rate is highest in the colliery areas, next highest in the metal areas, and lowest in the textile areas.† Again, infantile mortality tends to be somewhat higher in the textile than in the colliery towns and villages, and much higher than elsewhere; and this exercises a further check on the growth of population in the cotton centres.

When the second two groups, covering the Coal, Chemicals and Engineering districts, are considered together they show an increase of 3.1 per cent. This is the resultant of a natural increase of 8.8 per cent., less an outflow of 5.7 per cent. The migration from the South and West of the Survey Region was slightly more marked than that from the North and East. The growth of "Metropolitan Lancashire" is thus seen to have been due to the maintenance of a relatively high rate of natural increase. So far from having been due to inward migration, it took place in spite of a considerable net outflow of population to other parts of the country or overseas.

* Welton: *England's Recent Progress*, p. 84.

† *Trans. Manc. Statistical Society*, (1924-5), p. 26.

II.

It is not, however, so much the total population as the occupied or occupiable population with which this Survey is concerned. As an industrial area Lancashire may be expected to have a somewhat higher proportion of occupied, and a somewhat lower proportion of retired and unoccupied persons than the country as a whole. In 1891 Lancashire's percentage of the population of England and Wales, aged 10 years and over, was 13.6, whereas her percentage of *occupied* persons of the same age-groups was 14.8. Since then she has lost slightly in both respects: in 1921 only 13.1 per cent. of the whole population (12 years of age and over) and only 14.3 per cent. of the occupied persons were in the county.

This decline in the proportion of English workers living in Lancashire is found to exist for both males and females. But it is more marked for the former: for males the percentage fell, between 1891 and 1921, from 14.0 to 13.3, for females it fell only from 16.8 to 16.5.*

Lancashire is *par excellence* the county of female labour. It is one of the regions of England and Wales in which the ratio of females to males, occupied and unoccupied, is higher than the average: there were in the country as a whole in 1921, 1,096 females to every 1,000 males, but in Lancashire females outnumbered males in the proportion of 1,112 to 1,000. In several other counties this excess of females is more marked. But in respect of occupied females Lancashire is easily first: out of every 1,000 females in England and Wales, in 1921, 323 were described as "occupied"; out of every 1,000 in Lancashire 403 were so described. For the country as a whole there were 418 occupied females to 1,000 occupied males, for Lancashire 517 per thousand.

The following percentages show the increases in occupied population by sexes between 1891 and 1921.

	<i>Lancashire.</i>		<i>England and Wales.</i>	
	<i>Males.</i>	<i>Females.</i>	<i>Males.</i>	<i>Females.</i>
1891-1901 ...	12.6	2.8	14.6	3.9
1901-11 ...	10.3	14.1	12.8	15.8
1911-21 ...	4.9	5.3	5.8	4.9

In all three decades the expansion of male employment took place at a slower pace in Lancashire than in England and Wales. That of female employment was slower in the first two, but more rapid in the third decade. It is possible that, of the women who entered industry for the first time during the War, a bigger proportion of these in the County Palatine remained there when the Census of 1921 was taken. In so far as the present problem is one of finding employment for occupiable women this higher rate of growth between 1911 and 1921 makes the solution specially difficult for Lancashire.

* See Appendix 1, Tables VIII-XI.

Broadly speaking, the industries of the county are so distributed geographically as to allow of the employment of males and females in the same localities. For males the important industries are metal working and coalmining, and, in Lancashire, these are rarely found side by side, so that there is little competition between them for labour. For females the cotton and dress industries offer by far the largest volume of employment; and, though the two are frequently found in the same locality, the strongest concentrations of the dress trades are found in places other than those where spinning and weaving are the dominant activities. But both the cotton and dress industries exist on the coalfields, on the one hand, as at Wigan, Leigh and Burnley and in the engineering centres, on the other, as at Manchester, Salford, and Preston. Thus the men can work in the mines or engineering shops and their women-folk in the cotton mills or clothing factories. Under this arrangement the family earnings may reach a relatively high aggregate, though it is possible that the fact that women have opportunities of wage-earning may create local surpluses of male labour and so depress the wages offered to coal miners or engineers below the figures they would otherwise have reached.

It is not right, however, to treat the cotton industry as a purely female occupation, for although it employs over 300,000 women and girls it gives employment also to nearly 200,000 men and boys. And just as it has distributed itself geographically so as to obtain the larger number of females without leaving males unoccupied, so it has shown adaptability in varying the proportions of the two sexes to local conditions. Roughly it requires two males to every three females. But in Manchester, where the engineering trades exercise a demand for men and boys, the cotton industry satisfies itself with the lower ratio of less than 2 males to 5 females. In Blackburn where, again, there are large engineering works, the ratio is less than 1 to 2, and the same is broadly true of Salford and Bury. In Preston, where there are varied outlets for male labour, the cotton factories are staffed by some 17,000 females assisted by only 6,500 males, and about the same ratio is found at Leigh. More remarkable still are the proportions in Wigan and Warrington, where the coal and metal trades absorb the labour of males: in the cotton mills of each of these there are more than nine times as many females as males at work. On the other hand, in districts where there is no outstanding male occupation, men and boys in the cotton industry are nearly as numerous as women and girls. This is true, for example, of Rawtenstall and Bacup; and in Nelson the males employed are actually slightly in excess of the females.

A similar adjustment in the demand for labour of different types is made by the group of trades classified under the head of "Dress". For the county as a whole these employ slightly more than two females to every male. But in the chief centre, Manchester and Salford, where other varied employments are

open to men, there are only about 10,000 male workers to about 36,000 female workers. In the colliery town of Wigan the ratio is even lower (499 males to 1,928 females). But in Preston, on the other hand, the males in these trades are nearly as numerous as the females (1,065 to 1,296); and in Rawtenstall and Bacup, where the typically male employments are lacking, the slipper and shoe factories find work for more men and boys than women and girls.

The same compensatory local variation to the needs of the staple industry is made by the printing and paper trades. In these for the county as a whole males outnumber females in the ratio of almost 3 to 2. This is approximately the proportion found in Bury, where there were, in 1921, 786 male to 452 female employees. In Darwen, however, where the ratio of males to females in the cotton industry is low (about 1 to 2), the males found compensation in paper making, which employed 1,147 men and boys, but only 128 women and girls. In Warrington, on the other hand, where metal working is strongly developed, the position is reversed and the printing and paper trades employed only 205 male to 498 female workers.

Only in Widnes and St. Helens has no serious attempt at dovetailing of this kind been made. Here the staple trades offer little employment to women, and no industries of importance have arisen to offer work to the daughters and wives of the glass and chemical workers.

The Cotton Industry.

In Lancashire the textile industries hold pride of place, for though in 1921 there were 121 males per thousand in the metal trades as against 101 in textiles, for females the proportion in textiles was as high as 380 per thousand of those occupied. Among the textile occupations the spinning and weaving of cotton are of overwhelming importance. Their early history is one of steady concentration in the county, and by 1861 Lancashire held 78 per cent. of those engaged in these processes. Thereafter the proportion increased to 84.2 per cent. in 1891; and after a fall (to 82.5 per cent.) in 1901 it rose again (to 83.2 per cent.) in 1911.* Most of the cotton workers outside the county boundaries are in the neighbouring parts of Cheshire, Derbyshire and the West Riding of Yorkshire.

The characteristics of employment in the cotton industry are well known. As a factory occupation it arose largely out of the possibility of employing young children. But a series of Factory Acts gradually raised the age at which boys and girls might be engaged; and after 1844 children below the age of 13 years might be employed only as half-timers. In 1921 the half-time system was abolished and the age of entry (which had been fixed at 10

* See Appendix I, Table XII.

years in 1875, at 11 in 1893, and at 12 in 1899) was raised to 14. A study of the age-distribution of cotton workers over the past half century would show a steady rise of the average age, due partly to this legislation, partly to the rise of the average age of the population as a whole, and partly to an improvement in the standard of life of parents, and a growing reluctance to allow their children to enter industrial employment at an early age. To-day the personnel of the industry is predominantly adult. Those who fear that the postponement of the age of entry may lead to a decline of skill may find comfort in the reflection that the problem of juvenile recruitment is no new one, and that, in the past, the industry has been able to adjust itself without much trouble to the conditions imposed by legislation and social custom.

Important changes have also taken place in the ratio of the sexes employed. In 1861 there were about 132 females to every 100 males in cotton spinning and manufacturing; in 1911, the ratio had risen to 160, and in 1921 (according to the "Industry" Tables of the Census) there were 165 females to every 100 males. Normally the industry draws in more boys than girls; but not all boys recruited can find continuous employment in it as they grow in years, and there is an overflow of males to other occupations. Of the females 75 per cent. fall within the age groups between 15 and 35 years; but, although many women retire on marriage, the proportion of married women who continue in work is higher than that in the clothing trade, and probably in any other occupation.*

In periods when the industry is declining employment shrinks by a decrease of entrants at the lowest ages and by an increase in the number of exitants at all ages, especially in the case of males. When it is expanding it does so by taking in more boys and girls, and by retaining adults who would otherwise have left it. Expansion does not normally require the entrance of labour at any but the lowest ages.

During the past seventy years employment in cotton spinning and manufacturing has suffered many vicissitudes. Between 1861 and 1871 the numbers employed increased by 5.6 per cent. This figure, however, masks divergent movements in the numbers of the two sexes, for whereas the number of females increased by 12.1 per cent., that of males declined by 3.1 per cent. The number of males under 20 years of age was almost precisely the same in 1871 as in 1861, while that of females of the same age group had grown by over 9,000; men of 20 years and upward had decreased in number by over 4,000, while the number of women over 20 had increased by more than 15,500.†

The change in the proportion of the sexes may have been partly due to the substitution of power-looms, which could be worked by women, for hand-looms, which had been operated by men. But it

* Appendix 1, Table XIV.

† Appendix 1, Tables XII and XIII.

probably represents also a difference in reaction on the part of the two sexes to the disturbances of the period. Between 1861 and 1864 Lancashire passed through the darkest period of her history : when the Cotton Famine was at its worst, hundreds of mills were shut, and it was estimated that four-fifths of the operatives were in receipt of poor relief or private charity. In these circumstances many men emigrated or transferred their labour to other occupations, and when trade expanded between 1864 and 1867 they were no longer available for work in cotton spinning and manufacturing. Women, however, showed no such tendency to move. The result was that, whereas in 1861 there were 132 females to every 100 males in the Lancashire industry, by 1871 the proportion had increased to 153 per 100.

It is not possible to measure exactly the increase in the number of cotton workers during the next decade, for the figures of the Census of 1871 include those who described themselves as "retired," while those of the Census of 1881 refer only to persons still attached to the industry. If this difference is ignored the figures show an increase of 1.3 per cent. in male, against one of 9.9 per cent. in female employment. And even if the suggestion of the Census Authorities is followed, and the figures for 1871 are reduced by 2 per cent. to allow for the retired, it is clear that the number of males in the cotton industry was expanding at but a slow rate. It seems likely that, in this decade also, technical changes were producing a keener demand for female than for male labour. The introduction of the ring-frame in 1870 was perhaps largely responsible, for the ring-frame can be tended by women, whereas mule spinning requires the labour of men. But, again, a period of severe depression in 1878-9, resulting, as it did, in a fall of wages, probably led to an exodus of males from the industry. Whatever the cause, by 1881 the ratio of female to male labour had risen to 166 : 100.

On the whole the eighties were years of prosperity for cotton workers, though towards the end of the decade depression once more set in. Between 1881 and 1891 the imports of raw cotton increased by nearly 19 per cent. and the number of persons who found employment in the industry in England and Wales grew by nearly 12 per cent.* For Lancashire alone progress was even more rapid : those occupied expanded in numbers by 14.8 per cent. ; and it is worthy of note that the increase for males was almost as great as that for females, and the percentage increase (18.1 against 12.8) was considerably greater. Under the incentives of reduced hours and higher earnings boys entered the industry in large numbers, and men who would otherwise have moved to other employment continued to spin and manufacture cotton. The ratio was reduced to 158 females to every 100 males.

* Census of 1891, Vol. IV, General Report, p. 49.

The nineties were a period of almost unrelieved gloom, and for the first time since 1861 the Lancashire cotton industry showed an absolute shrinkage of its personnel. But, the number of females occupied in it fell by only 2.6 per cent., while that of males shrank by no less than 8.9 per cent. This time, however, the decline was not due to any marked exodus of adults. There was, indeed, in the cotton industry of England and Wales an actual increase in the number of females between the ages of 20 and 45 years, but this was outweighed by a fall of no less than 26.5 per cent. in the entrants at ages between 10 and 15 years. Similarly for males, the operatives in each decennial age group from 25 to 65 showed an increase, but this was more than offset by a cutting off of recruitment of boys and youths. For the country as a whole the number of males below 15 years of age fell, between 1891 and 1901, by as much as 34.4 per cent. and those between 15 and 20 years by 19 per cent.* The explanation given is the strong attraction offered to boys at this period by the growing opportunities of employment in the engineering and machine-making trades. In 1901 the proportion of females to males in the Lancashire cotton industry reached its maximum of 169 to 100.

During the three years following the Census of 1901 trade was poor, but in 1904 the revival began which was to lead to the boom of 1906-7; and the decade 1901-11 saw an expansion in the number of spindles and looms, in the imports of raw cotton, and in the export of yarn and piece-goods, greater than that of any other ten-year period here considered. In these years of phenomenal growth the employment of males increased by no less than 19.3 per cent. while that of females grew by 13.0 per cent.; and in 1911 the proportion of females to males had fallen to 160 : 100. Both rates of increase are considerably higher than that of the population of the county. For England and Wales the increase in the number of male cotton operatives was 36,482, of which less than a thousand was due to young people below the age of 15, and less than a thousand to those over 65; at the age group 15-20 the percentage increase was 27.7 (as against a percentage decrease of 19.0 in the previous decade) and at the age group 20-25, 18.0 (as against a decrease of 10.6 per cent. between 1891 and 1901). Clearly the drain of youths from the cotton to the metal trades had ceased to operate. Between the ages of 25 and 35 the percentage increase was small (6.8), which was only to be expected in view of the fact that those in this group were the survivors of a small draft of recruits of ages 15-25 in 1891-1901. But at all ages between 35 and 65 the rate of increase was high. Evidently the normal outflow of middle-aged men from the industry was arrested by the prosperity of trade, and it is possible that some who had previously gone to other occupations, or who had retired, were now returning.

* Appendix 1, Table XIV.

Notwithstanding this increase of middle-aged men, the cotton industry of 1911, as of earlier periods, employed more than its share of young, and less than its share of elderly, male workers. This is seen at a glance when the numbers of males in the occupation in Lancashire of each age-group are expressed as percentages of the total, and these are set alongside the corresponding percentages for all occupied males in Lancashire:—

Percentages at each age.

<i>Ages.</i>	10—	15—	20—	25—	35—	45—	55—	65—	75—
All Occupied Males...	3·8	13·3	12·9	24·8	20·4	14·1	7·8	2·5	0·3
Male Cotton Workers	10·7	19·6	14·0	20·9	16·6	11·4	5·2	1·3	0·1

At ages below 25 the proportion of males is far higher in the cotton industry than among all occupied males; above 25 all age-groups show a lower percentage of male cotton operatives.

For females the decade 1901-11 saw a small percentage decline in numbers at ages below 15 and only a small expansion in the age-groups to 25 years. Between 25 and 35 the percentage was, however, 20·7; between 35 and 45, 29·6; between 45 and 55, 47·3; between 55 and 65, 40·6; and between 65 and 75, 61·3. Commenting on these figures the Registrar-General observes:

“ Among females the most striking features are the great increase . . . at ages 25 and upwards, and the extent to which the rise at ages 25-45 among the married or widowed has exceeded that among the unmarried. In view of the general prosperity of the industry, as denoted by the increased numbers employed, the increase of married women may be due to a higher marriage-rate among the female operatives and to married women re-entering the industry in greater numbers. It is notorious that employers have been put to great straits for lack of hands and evidence of the extent to which all available labour has been drawn into the mills may be found in the remarkable rates of increase in the number of elderly spinsters employed. The younger un-married women were presumably employed as fully as possible already; so their numbers have not greatly increased, but older women who were not formerly employed to nearly the same extent seem now to have been called upon as a veteran reserve.”

As for males so for females the cotton industry continued, however, to draw its labour from the young, as is seen when the age distribution for female cotton operatives is set against that for all occupied females in the county:—

Percentages at each age.

<i>Ages.</i>	10—	15—	20—	25—	35—	45—	55—	65—	75—
All Occupied Females	5·8	22·9	20·7	23·5	13·2	8·2	4·1	1·4	0·2
Female Cotton Workers	9·9	25·2	20·6	24·3	12·3	5·7	1·7	0·3	0·0

At the age-group 20-25 the percentage of female cotton operatives was slightly lower than that of all occupied females; but with this exception, it is true to say that the cotton industry took a larger

proportion of females below 35 years of age, and a smaller proportion above that age, than did other occupations. And this in spite of the big influx of elderly women in the decade 1901-11, and the tendency, already noticed, for women to remain at work in the industry after marriage. Whereas not quite two-thirds of the male operatives were under 35, exactly four-fifths of the female operatives were under that age.

It is unfortunately impossible to state the exact movement of the numbers engaged in the Lancashire cotton industry between 1911 and 1921, for the only relevant figures given in the Tables of Occupations are for the larger area of "Lancashire with parts of Cheshire and Derbyshire." The county, however, includes such a high percentage of the total engaged in the industry in England and Wales that we may assume that what is true of the latter is also broadly true of Lancashire. Between 1911 and 1921 employment in the cotton industry shrank by 5 per cent.; but whereas the percentage decline for females was 2, that for males was 10. The decline in the number of females was, no doubt, due to a reduction in the demand for labour, and to the deflection of women, during the war, to work on munitions; that in the number of males was undoubtedly due mainly to recruitment in H.M. Forces.

This brief survey of the history of employment in cotton spinning and manufacturing (supplemented by the figures in Appendix 1, Table XIII) seems to justify the generalisation that male operatives are much more susceptible to the attractive forces of other occupations, and to the repulsive forces of depression in the industry than are female operatives. For obvious reasons men and boys have more industrial mobility than have women and girls.

The Dress Trades.

It is perhaps natural that the group of occupations classified under the heading of "Dress" should be closely associated geographically with the making of textile fabrics, and it is not surprising to find a strong concentration in Lancashire. Besides the manufacture of garments, the category includes the making of gloves, boots and shoes, and umbrellas, and if this had been excluded the proportion of persons employed in Lancashire to those in England and Wales would have been somewhat higher. As it is, in 1911 about 12 per cent. of the dress workers of the country were in Lancashire. An examination of the Industry Tables of the 1921 Census shows that Lancashire and the associated parts of Cheshire and Derbyshire contained no less than 79 per cent. of the persons engaged in making felt hats, 48.4 per cent. of those making cloth hats and caps, and 22 per cent. of those making other hats and caps. The area held 61 per cent. of the makers of clogs, 37 per cent. of the makers of underclothing, 19 per cent. of the makers of shirts, collars and overalls, 17 per cent. of the milliners, and 17 per cent. of the tailors.

The making of the diversified forms of dress is widely distributed throughout the county. There are naturally tailors and dressmakers in every town; but among the places in which the clothing industry shows a special development are Preston, Wigan, Blackburn and Bolton, while the making of boots and slippers is strongly localised in Rossendale, where discarded textile factories have been utilised for the purpose, especially in Rawtenstall and Bacup. It is, however, in Manchester and Salford that the industry is most strongly concentrated. About one-third of the male and nearly one-half of the female workers of the Lancashire industry are in these two boroughs, and Manchester is the greatest clothing centre in the country.

The distribution of employment between the sexes varies considerably from place to place. In Manchester there are four times as many females employed as males—and if the making and repair of boots and shoes were excluded the proportion would be still greater. The same is true of the neighbouring districts of Stretford, Eccles, and Swinton and Pendlebury. Again, in Wigan females outnumber males in the ratio of four to one. In Blackburn, Bolton and Burnley there are approximately two females to every male engaged in the industry; in Preston the numbers are about the same for the two sexes; and in the boot and slipper area of Rawtenstall and Bacup, the number of males employed is somewhat in excess of that of females. For Lancashire as a whole the proportion is slightly more than two females to every male.

The predominance of women in the dress industry is easy to understand. The occupations included in it have always, to some extent, been followed by women in their own homes for their own needs, and it is only in comparatively recent times that the making of clothes has become a factory industry. When it did it was but natural that the factories should be staffed by women and girls. If we can trust the Census figures, the number of males employed in the county in the dress trades grew between 1871 and 1911 by 17.4 per cent. This is but a slight pace of progress, and there is no evidence that it is quickening greatly at the present time. The industry, apparently, offers little scope for boys: of the males engaged in it in 1921 only about one-eighth were below 20 years of age, whereas in the textile trades about one-quarter of the males were under 20. Table XVI, Appendix 1, indicates that the expansion of male employment was greatest during the decade 1891-1901, when the cotton trade was suffering depression, but even then the increase was by no means great.

The growth of female employment, on the other hand, has been rapid: between 1871 and 1911 it increased, in Lancashire, by no less than 114 per cent. In 1871 there were already 115 females to every 100 males employed in the making of dress in the county; by 1911 the ratio had increased to 215 to 100. The rate of expansion for females appears to have been greatest in the years

1871-1881—a fact that may, perhaps, explain the slackening in the increase in females in the cotton industry in this decade. But, throughout the period considered, it was somewhat more rapid in Lancashire than in the whole of England and Wales. Whereas between 1871 and 1911 the fraction of the dress workers of the country who were Lancastrians increased for males from one-tenth to one-ninth, that for females increased from one-twelfth to one-eighth.

Like the female cotton operatives the female dress workers are relatively young; in 1921 more than half of them were under 25 years of age and more than three-quarters under 35. But, unlike the cotton operatives, relatively few of them were married. Of the female cotton workers no less than 28 per cent. were returned as married women, of the dress workers less than 13 per cent. There are indications that the dress trades of Lancashire have by no means reached the limit of their growth: if the past is any guide they may be expected in the future to offer work to single women and girls rather than to married women or men. If they continue to expand they may do something to relieve existing unemployment; but if they are to make an important contribution to the solution of the problem they must follow the course of the cotton industry at an earlier period and spread from Manchester to the north and east. Of such a movement there is no present indication.

Coalmining.

By far the most important coalfield in the Survey Region is that of Mid-Lancashire, extending from St. Helens north to Wigan and Chorley, and thence south-east by Bolton and Rochdale to Ashton-under-Lyne and Stockport. But there are also subsidiary fields about Burnley and Manchester.

The industries so far surveyed have been predominantly female in their personnel: in discussing coalmining it is hardly necessary to take account of women and girls. It is true that some are employed about Wigan, St. Helens, and Leigh in work at the pit-head, and that six-sevenths of all the women employed in the coalmining industry of the country are in Lancashire. But the absolute numbers are small; they increased steadily from 1871 to a maximum of 2,378 in 1911, and fell slightly, to 2,331, in 1921.*

Men and boys in the industry increased in numbers less rapidly than the total occupied male population of the county between 1861 and 1871; but in each of the two succeeding decades employment expanded by more than 30 per cent.† In the nineties the rate of increase fell off considerably, possible because of the depression in the cotton industry, which is a large consumer of locally produced coal. The number employed in coalmining grew by 11.7 per cent.

* Appendix 1, Table XVII.

† Appendix 1, Table XVIII.

only, as against an increase of 12.6 per cent. for all occupied males in Lancashire. Between 1901 and 1911, however, mining expanded its offer of employment considerably: there were 16.4 per cent. more coalminers in 1911 than in 1901, whereas male employment as a whole grew by only 10.3 per cent. The rate of expansion in the numbers employed in the industry was, in this decade, considerably greater than that in the output of coal, which was stationary or tending to fall slightly, owing, no doubt, to the working of deeper and less accessible supplies, as well as the operation, after 1909, of the Eight Hours Act. Between 1911 and 1921 the growth of employment in coalmining was slightly less (4.6 per cent.) than that for all male occupations in the country (4.9 per cent.).

In Lancashire the coal industry hardly competes for labour with the other staple occupations. It is true that cotton spinning and weaving are carried on in the heart of the colliery area at such places as Leigh and Wigan, and mining is a subsidiary occupation in typically textile areas like those of Bolton and Burnley. One has even heard of a collier forsaking the mine for the factory, but within a fortnight he returned to his old work, remarking simply, "You do know you are safe in the pit." The types of skill and strength required in the two occupations are so different that the labour supply of each must be largely independent of that of the other. For one thing, cotton spinning and weaving require more young people than does coalmining, as is shown by the following percentages calculated from the Census of 1911.

Percentages at each age.

Ages.	10—	15—	20—	25—	35—	45—	55—	65—	75—
All Occupied Males ...	3.8	13.3	12.9	24.8	20.4	14.1	7.8	2.6	0.3
Male Coal Miners ...	3.0	13.7	14.7	26.0	20.4	13.8	6.8	1.6	0.1
Male Cotton Operatives	10.8	19.6	14.0	20.9	16.6	11.4	5.2	1.3	0.1

Apart from a somewhat higher percentage at ages between 20 and 35, and a somewhat lower percentage above 65, employment in coalmining in Lancashire conforms closely to that of occupations in general; that in the cotton industry shows considerable divergence from it. It is possible that youths who have spent the early part of their industrial career in cotton mills may later transfer to coalmining, but as already suggested, it is unlikely that there is much going and coming between the two on the part of adults.

This impression is strengthened by a comparison of the rates of growth of the two occupations between 1861 and 1921:—

Percentage Increase or Decrease in Male Employment.

	1861-71.	1871-81.	1881-91.	1891-1901.	1901-11.	1911-21.
Coalmining ...	9.2	30.5	30.1	11.7	16.4	4.6
Cotton Spinning and Weaving.	-3.1	1.3	18.1	-8.9	19.3	-2.0

Employment in coalmining has been steadier in its development than that in cotton manufacture; but there is a distinct tendency for its rate to quicken when employment in cotton factories is expanding and to slacken when this is shrinking. An increase in cotton operatives does not mean a decrease in coal miners: it is associated with an increased demand for coal, and accordingly for those engaged in getting coal.

The seams of Lancashire are thin and broken and coal has now to be brought from considerable depths; it is therefore unlikely that any considerable expansion of mining will again be seen in the county. A further development of the glass and chemical industries may find employment for the collier population about St. Helens, but it is not easy to see what new industries will take the place of mining for the growing communities of Wigan and Leigh and the scattered villages of the coalfield.

The Metal Trades.

In Lancashire the metal trades are concerned less with the smelting and refining of crude materials than with the manufacture of engineering products. It is true that pig iron and steel are produced on a large scale at Barrow, and that there are iron-works at Wigan, Warrington, Darwen, and other centres. But the smelting, puddling, and rolling of iron and steel employed in 1921 only 1 per cent. of the occupied males in the Census area of Lancashire and parts of Cheshire and Derbyshire; and the founding and other secondary processes in metal working (including the manufacture of wire) only a further 1.3 per cent. General engineering, on the other hand, accounted for 7.6 per cent. of the occupied males, electrical engineering for 1.8 per cent., the building and repairing of vehicles for 2.3 per cent., ship-building and marine engineering for 2.7 per cent. and other metal industries for 1.5 per cent. Taken together this group of metal trades was responsible for the employment of 18.2 per cent. of the males of Lancashire, while the textile industries in all processes employed only 15.3 per cent.

The metal trades are widely distributed about the county, but it is a remarkable feature of Lancashire that they show slight development on the coalfields. Just as male textile workers and coal miners may be regarded as non-competing groups, so may metal workers and coal miners. The reason is probably to be found in the tendency, already discussed, to obtain such a distribution of occupations that both males and their women-folk can find employment in the same areas. The cotton industry, with its predominant demand for female labour, covers a wide field; it is convenient that in one part of this field men and boys should find work in the mines, and that in another part they should be employed in the elaboration of metals and the manufacture of engineering products.

Other, historical, influences have probably also helped to determine the present geographical distribution of the industry. In the eighteenth century the tool and wire trades had come to a lusty growth on the outskirts of the coalfield about Warrington and Prescott, as well as in Liverpool, and they are still carried on in these parts. Local supplies of iron-ore and facilities for transport by sea led to the rise of the smelting and refining of iron and steel, after 1858, at Barrow. The far more important engineering industry grew up earlier out of the need of the cotton spinners and manufacturers for machinery and power; it was the making of textile machinery (including steam engines) that brought the modern industry into being, after 1790; and the earliest firms were naturally set up in Manchester and Salford, and in such large textile centres as Oldham and Bolton. After the opening of the Manchester and Liverpool Railway there began a rapid growth of general engineering which was strongly localised in Manchester and Salford. And since the early eighties, when it was first introduced to Lancashire by Messrs. Mather and Platt, electrical engineering has concentrated in the same district, though there is a considerable development also about Preston.

The frequent changes that have taken place in the Census classes make it exceedingly difficult to trace the growth of the separate metal trades statistically. In Table XIX, Appendix 1, they are therefore aggregated and the figures there given relate to workers in engineering and machine making, to those engaged in the production of tools, arms, types, dies, surgical instruments, weighing machines, vehicles, and electrical apparatus, as well as to the large group of workers in the miscellaneous metal trades, including workers in tinsplate, copper, lead, and brass. Those engaged in the building and repair of ships have been omitted, for almost all of these must fall outside the boundaries of the Survey Region.

It has not been considered safe to attempt to present figures of employment in the metal trades before 1881. But it may be pointed out that the years 1871-81 saw an expansion in the number of makers of machines of no less than 28 per cent. for the country as a whole. Lancashire's share in this result must have been a large one, for the makers of spinning and weaving machinery had increased by approximately 100 per cent. in the decade, and nearly half of the workers concerned were in Lancashire. General engineering was certainly growing rapidly in the county during the same period, and in 1881 Lancashire easily took the lead among the counties in the numbers engaged in the making of engines and machines other than spinning, weaving, or agricultural.* It was probably this development that accounted for the low percentage increase, already noticed, in the number of male textile workers in this decade.

* Census of 1881. General Report, p. 39.

Between 1881 and 1911, the number of metal workers in Lancashire practically doubled. Between 1881 and 1891 the increase was 18.0 per cent.—a rate considerably greater than that of the whole occupied population of the county. But the period of phenomenal growth was between 1891 and 1901 when there took place an increase of no less than 32.0 per cent. in the number of males employed. Such a growth can have been made possible only by drawing on the potential labour supplies of other industries; and, as already pointed out, large numbers of males between the ages of 15 and 25 who would have found employment in cotton factories, had the cotton industry been prosperous, moved into the engineering and machine-making trades. How high a proportion of the workers in the metal trades as a whole (including ship-building) were between these ages in 1901 is indicated by the following figures:—

Percentage Age Distribution of Male Workers in Lancashire, 1901.

Ages.	10—	15—	20—	25—	35—	45—	55—	65—	75—
All Occupied Males ...	4.5	14.5	14.7	25.1	18.8	13.0	6.9	2.2	0.3
Male Metal Workers	2.7	16.9	15.4	25.1	17.7	13.1	7.0	1.9	0.2

The metal trades employed a small proportion of workers below 15 years of age, but those between 15 and 25 formed 32.3 per cent. of the whole, as against 29.2 per cent. for all occupied males of the same ages.

Between 1901 and 1911 the pace of development slackened; the percentage growth of males employed in the metal industries fell to 17.5, but even this was considerably in excess of that of all occupied males in the county, which was only 10.3 per cent. Alterations in the methods of return and classification between 1901 and 1911 make it impossible to compare the numbers employed at the time of the two Censuses in the various branches of the industry. But there is evidence of a positive decline of those engaged in the primary processes of iron and steel production—the number of iron-founders, for example, fell by 11 per cent.—and a considerable rise in those employed in general engineering and machine-making, where the numbers increased by 22.9 per cent. Lancashire was evidently increasing her specialisation in the working-up, as distinct from the production, of metals.

The expansion in employment in this group (of over 17,000 workers) was almost entirely due to an increase in the number of men over the age of 25 years, and in particular of those between 25 and 45 years of age. While it was still true that the average age of metal workers was below that of all occupied males, the divergence from the general distribution was less marked in 1911 than in 1901.

Percentage Age Distribution of Male Workers in Lancashire, 1911.

Ages.	10—	15—	20—	25—	35—	45—	55—	65—	75—
All Occupied Males ...	3.8	13.3	12.9	24.8	20.4	14.1	7.8	2.6	0.3
Male Metal Workers	2.1	14.4	14.3	26.2	20.0	13.2	7.4	2.2	0.2

The difference at ages 15-20 had narrowed considerably, and, though the differences at 20-25 and 25-35 had increased this was obviously due to the growing up of the large body of young recruits to the industry in the previous decade. The change in the age distribution can be seen at a glance from the following figures :—

Percentage Age Distribution of Male Metal Workers in Lancashire.

Ages.	10—	15—	20—	25—	35—	45—	55—	65—	75—	
1901	2.7	16.9	15.4	25.1	17.7	13.1	7.0	1.9	0.2
1911	2.1	14.4	14.3	26.2	20.0	13.2	7.4	2.2	0.2

Those of ages between 15 and 24 inclusive formed 32.3 per cent. in 1901, but only 28.7 per cent. in 1911. Men, 25 and over, formed 65 per cent. of the whole in 1901, but 69.2 per cent. in 1911. In the decade 1901-11 the prosperity of the cotton industry was attracting boys and youths in large numbers and the metal trades had to make shift with fewer entrants at the lowest ages.

One branch of the industry recorded exceptional progress during these years. From its tiny beginning about 1881, the making of electrical apparatus had grown to considerable importance. The numbers of workers returned for Lancashire were for 1881, 251; for 1891, 2,126; for 1901, 7,917; and for 1911, 15,761. The increase of nearly 8,000 in the last decade was greater than that in any other county, and in 1911 Lancashire was by far the greatest centre of the industry outside London. Considerable development was taking place in other branches also; in the construction of railway carriages and wagons, for example, Lancashire stood second only to the West Riding, and in the number of workers engaged in the making of cycles and motor cars she was exceeded only by Warwickshire, London, and Staffordshire.

It is unfortunately impossible to indicate even approximately the growth of the metal trades between 1911 and 1921; for neither the "Occupational" nor the "Industry" figures of the Census of 1921 are comparable with those of earlier Censuses. It is known, however, that under the stimulus of war-time demand the industry grew rapidly, and in 1921 it must have occupied a larger percentage of the population of the county than at any previous period. In particular there took place a considerable extension of the openings for women in engineering. Whereas of all metal workers in the county in 1911 only about 3 per cent. were females, in 1921 the proportion had grown to about 5 per cent.

Summary.

During the first half of the nineteenth century it appeared to superficial observers that England was destined to become the crowded workshop of the world. And long after this expectation had been stigmatised by Disraeli as "an arrogant aspiration" it was still possible for Lancastrians, with less presumption, to believe that their county was destined to become the workshop of England. That illusion, too, was to be shattered by the march of events.

Until the last decade of the century, it is true, the people in the county continued to increase in numbers more rapidly than those in the rest of England and Wales; but since 1891 the progress of population in Lancashire has flagged. As early as 1861 the period of rapid expansion of employment in the all-important occupation of spinning and weaving cotton had come to an end; for in the sixties and seventies, the industry extended its offer of work but slightly, and at no time since has its growth been comparable with what is known to have taken place in the first half of the century.

This retardation of progress in the cotton industry was, for a time, balanced by a growth of new enterprises. But these grew up largely outside the textile districts; and the result was a shifting of the centre of population (rather by a change in the natural rate of increase than by actual migration) from the North and East to the South and West of the Survey Region. The opening of the Manchester Ship Canal in the nineties accentuated this drift from the outlying parts of the area to what has been called Metropolitan Lancashire.

During the past forty years the economic life of the Region has rested on the cotton, coal, engineering, and dress industries. And though from time to time the structure might be buttressed by new industries (of which the paper and printing and the chemical trades are examples*) its safety depended fundamentally on the strength of these four corner-stones.

This architectural metaphor fails to reveal the organic relation in which the staple industries stood to one another. It has been shown that they had so arranged themselves that the joint supply of different kinds of labour offered by the fact of family life could be matched by a joint demand on the part of industrialists. Sometimes males and females, children and adults, could find employment in the same establishment. But it was probably more usual for the men and boys to enter the pit or the engineering works, and the women and girls the cotton mill or the clothing factory. The cotton and dress industries showed a remarkable readiness to accommodate themselves to the needs of other occupations by varying the proportions of males and females employed, not only between localities at any one time, but also, for the industries as a whole, between one time and another. They offered, in fact, an illustration not only of a joint demand, but also of an alternative demand, for the labour of the two sexes.

Generally, fluctuations in trade prosperity in each of the four staple industries tended to synchronise. An expansion of engineering or the manufacture of cotton was bound to increase the demand for coal. An increased rate of growth of the cotton and coal industries necessarily extended the demand for textile and mining machinery

* The progress of these is illustrated in Appendix 1, Tables XX and XXI.

and so brought prosperity to the engineering trade. A growth of the clothing trades was stimulating to the cotton industry which supplied much of their raw material. And an increase in the number of wage-earners in any of the others meant an increased demand for the products of the dress industry.

If it is true, however, that the staple industries of Lancashire are consumers of each other's products, it is also true they are competitors for labour: there is a substitutional as well as a complementary relationship between them. The two largest are intimately dependent on exports; and favourable or adverse conditions abroad affect their demand for labour, irrespective of conditions at home. It was lucky for Lancashire that when, in the sixties and seventies, the demand for labour in the cotton industry ceased to expand as rapidly as the number of potential operatives, the coal and dress industries were undergoing rapid expansion, and males could find an outlet in the one, and females in the other. It was Lancashire's good fortune that, when the textile trades were depressed in the nineties, the engineering industry should be experiencing its most rapid rate of increase. And, again, it was a happy coincidence that when the dress and engineering trades showed a slackening in progress between 1901 and 1911, the cotton and coal industries both saw a substantial revival of prosperity. It is tempting to make comparisons and to draw contrasts between these earlier experiences and those of the decade 1921 to 1931. But to do so would be to invade a field reserved for other investigators.

CHAPTER 2.

TRENDS IN POPULATION, EMPLOYMENT AND UNEMPLOYMENT SINCE 1921.

Employment in the Survey Region in the last ten years can only be seen in its right perspective against a background of changes in the size, nature and movements of the population. Unfortunately, the information available is not complete enough to lead to definite conclusions. Whilst the preliminary results of the 1931 Census are already published, the tables relating to age distribution and occupations will be issued, in the normal course of events, only in about two years' time. There are, indeed, strong reasons why preparation of the age and occupational material of the Census, particularly for the depressed industrial areas, should be hurried on as quickly as possible, for certain vital questions regarding changes in the size of the occupiable population can only be answered by a comparison of the 1921 and 1931 Censuses. A second serious gap is the absence of complete information of the industries and occupations entered by children leaving school between the ages of 14 and 16 years. It is true that the work of the Juvenile Employment Bureaux and Juvenile Advisory Committees covers

part of this field and certain Local Education Authorities have shown themselves more energetic than others in collecting statistics of this sort. But if in future a close watch is to be kept upon the position in the labour market, it will be essential to supplement the existing fragmentary knowledge with the results of more far-reaching enquiries than have yet been undertaken.*

Nevertheless, it is possible to make certain approximations regarding the labour market in the Survey Region and to indicate roughly how far the position has been the outcome of population changes since 1921, especially as the statistical work of the Ministry of Labour in connection with the Unemployment Insurance Scheme is rapidly building up an invaluable mass of detailed information.

1.—The Size of the Occupiable Population.

Between the 1921 and 1931 Censuses, the population of the whole of Lancashire increased by 106,000 persons, an increase of 2.2 per cent. ; the population of the Survey Region increased by 80,000, an increase of 1.9 per cent. The percentage increase of males and females in both areas was roughly the same.

TABLE I.
Population of Lancashire and the Survey Region.
1921-1931.

	Lancashire. Administrative County and Associated County Boroughs.			Survey Region.		
	Persons.	Males.	Females.	Persons.	Males.	Females.
1921	4,932,951	2,335,566	2,597,385	4,135,062	1,950,944	2,184,118
1931	5,039,097	2,384,442	2,654,655	4,214,809	1,990,909	2,223,900
Net Increase ...	106,146	48,876	57,270	79,747	39,965	39,782
Percentage Increase.	2.2	2.1	2.2	1.9	2.0	1.8

For present purposes the number of persons at occupiable ages is of greater moment than the size of the total population, since it is quite possible, through changes in the age distribution of the population, for total population and occupiable population to change at different rates. Unfortunately, there is no exact information of the present age distribution of the population, and in consequence a precise estimate of the numbers between the ages of 14 and 64 years cannot be made. It is extremely probable, however, that changes in age distribution have taken place of sufficient importance to have reactions upon the numbers available for occupation.

* See Part I, Chapter 5.

The Registrar-General each year publishes an estimate of the age distribution of the population for the whole of England and Wales and for certain large areas within the country, one of which is the "North".* The table below suggests that between 1921 and 1929 the age constitution of the population so changed that a higher proportion of the total population falls between the ages of 15 and 64 years now than in 1921.

TABLE II.

Estimated Proportion of Population between the ages of 15 and 64 years inclusive in England and Wales and the "North". 1921 and 1929.

	1921.			1929.		
	Males.	Females.	Total.	Males.	Females.	Total.
	Percent- age.	Percent- age.	Percent- age.	Percent- age.	Percent- age.	Percent- age.
England and Wales ...	65·3	67·1	66·2	67·6	69·2	68·5
"North"	65·9	67·4	66·6	68·5	69·7	69·1

The effect of this change in Lancashire cannot be determined exactly. But its order of importance can be shown by a very rough calculation. The population in Lancashire in 1921 was about 4,900,000. If it is assumed that between 1921 and 1929 the age distribution changed to the same degree in Lancashire as in the "North", this change in itself, without any increase in population, would have been sufficient to increase the numbers of persons between 15 and 64 years by roughly 120,000—60,000 males and 60,000 females. The increase in numbers thus occasioned in the occupiable population would depend, of course, upon the relation between total and occupiable population. If the relation between total and occupied population shown by the 1921 Census is taken, the net increase of persons occupiable would be about 60,000—40,000 males and 20,000 females. It is, therefore, extremely probable that the numbers available for employment in Lancashire have increased more rapidly than total population since 1921.

The statistics of the insured population in the Region tend to confirm these views. The number of insured persons has not, of course, any necessarily direct connection with the size of the total occupiable population. The number of insured persons may vary with changes in the law and administration of the Unemployment Insurance Scheme; it will reflect movements between insured and uninsured trades; in periods of extremely bad trade, large numbers of people may pass the age of 16 years, and, because

* The "North" comprises Lancashire, Cheshire, Yorkshire, Cumberland, Northumberland, Durham and Westmorland.

of continuous unemployment, not come within the insured population. Despite these limitations, however, the statistics are so comprehensive that great importance must be attached to them, and in the Survey Region the trends revealed are of great moment.

TABLE III.
Total Insured Population in Survey Region.† 1923-1931.*

	Males.		Females.		Total.	
	Actual.	1923=100.	Actual.	1923=100.	Actual.	1923=100.
1923 ...	881,617	100	496,734	100	1,378,351	100
1924 ...	880,903	100	514,808	104	1,395,711	101
1927 ...	901,417	102	530,244	107	1,431,661	104
1929 ...	922,310	105	543,300	109	1,465,610	106
1930 ...	926,380	105	562,130	113	1,488,510	108
1931 ...	939,030	107	572,670	115	1,511,700	110

It will be seen that the percentage increase in the insured population, both for males and for females, between 1923 and 1931 was much greater than the increase in total population 1921 to 1931. In particular, the rapid expansion in the insured female population far outstrips the population increase.

Many factors have contributed to the movements shown in Table III. Legislative and administrative changes in the conditions governing the receipt of benefit have very probably helped to swell the insured population. In the case of females particularly, the point is commonly made that the modifications which have been introduced into the operations of the Unemployment Insurance Scheme have led to an increase in insured population in Lancashire without any increase in the numbers willing and able to take up employment. On the other hand, it must not be overlooked that a period of widespread unemployment among married men naturally leads a higher number of women to offer themselves for employment. This is the case in the cotton industry where

* By virtue of the provisions of the Widows', Orphans', and Old Age Pensions Act, 1925, all persons aged 65 years and over ceased to be insurable under the Unemployment Insurance Acts from January, 1928. This involves a break in comparability between the statistics for the years 1923-27 and those for later years. In order to make allowance for this in the above table, adjustments have been made based upon the Ministry of Labour "Report on an Investigation into the Employment and Insurance History of a Sample of Persons Insured against Unemployment in Great Britain," 1927. This sample enquiry showed that in April, 1926, for the whole of the United Kingdom, 3.6 per cent. of the males and 0.8 per cent. of the females insured were 65 years or over. In the table, the figures for the earlier years 1923-27 have been made comparable by deducting from them the percentages given above. This assumes, of course, that the proportion of the insured population over 65 years of age was the same in industries of the Survey Region as in British industry as a whole and that what was true for 1927 was also true for 1923 and 1924.

† The Region includes the Employment Exchange areas named on the map facing p. iv.

female labour is so extensive. Widespread unemployment, accentuated by short-time working and under-employment among men, has made it necessary, for the maintenance of family income, for more women to seek work and for others to delay their retirement. It may well be, therefore, that this marked increase in the number of women anxious to find work is merely a reaction to the unemployment among men.

Nevertheless, there are certain strong suggestions that in recent years the number of women counted within the insured population has been abnormally swollen by changes in the law relating to, and the administration of, Unemployment Insurance.* Of these, the remarkable slowing-up of the rate at which women have been leaving industry is perhaps the most significant. This is dealt with in detail in a later section.†

2.—The Volume of Employment. 1923-1931.

Whilst the total, the occupiable, and the insured population in the Survey Region have been steadily increasing, the volume of employment has shown no similar expansion. Of this the only index is that of the insured employed population. But it is extremely important to realise the limitations of figures of insured employed persons, and, since such figures will be freely used in later chapters, their limitations must be explained in detail.

In the first place, the Insurance Scheme does not cover all workers. Juveniles under 16 years and persons above 65 years; persons employed otherwise than by way of manual labour at a rate of remuneration exceeding in value £250 per annum; persons engaged in agriculture and private domestic service; shore fishermen; outworkers; a number of those engaged by public local authorities, railways and certain public utility undertakings; nurses; members of the police and defence forces; persons with rights under a statutory superannuation scheme such as civil servants and teachers—all these are excluded from the scheme. Secondly, the Ministry of Labour statistics of unemployment based on "books lodged" do not take account of certain forms of under-employment which are of particular importance in the cotton industry.‡ Thirdly, and perhaps most important of all, it is essential to have a clear conception of unemployment as it is measured by the Ministry of Labour statistics. An unemployed person, within the meaning of the Unemployment Insurance Acts, is one who is not at work on a particular day when the count of "books lodged" is made. Consequently, the annual average number of persons

* This was written before the effects of later legislation became apparent. There cannot be any doubt that the modifications of the Unemployment Insurance Scheme since August, 1931, will reduce the size of the insured population, particularly among females.

† See p. 120.

‡ See p. 104.

unemployed, which is used in compiling the table below, is really an average of the numbers not at work on four days at quarterly intervals in that year. Fourthly, in the statistics that follow, no allowance is made for those who, whilst technically not unemployed, were absent from work through sickness, trade disputes or holidays.

The use of Ministry of Labour figures of unemployment introduces one serious difficulty: How far does the number of persons who are recorded as unemployed represent persons who are anxious to and able to work? How far have the various legal and administrative changes in the Unemployment Insurance Scheme rendered comparisons, between one period and another, invalid in some degree? These questions cannot, of course, be answered. They are bound up with immeasurable intentions and states of mind. The figure of "books lodged"* upon which the Ministry of Labour bases its unemployment statistics, represents all insured persons maintaining registration at Employment Exchanges, but, in turn, the number of persons who will think it worth while to maintain registration will mainly depend upon the conditions they must satisfy if they are to substantiate claims to benefit. It is, of course, certain that legal and administrative changes in the Unemployment Insurance Scheme can influence the numbers of insured and unemployed persons, particularly at periods and in regions of deep depression. And in certain cases the effects of such changes can be estimated.† But in general, and particularly for small areas of the country such as the Survey Region, the possibility remains that factors of this nature may, to some degree, invalidate the conclusions to be drawn from these statistics.

The use of statistics of insured employed persons avoids the difficulties connected with such administrative changes, since any abnormal accretions to the insured population will be added also to the numbers of the unemployed and will be eliminated by the deduction of the total unemployed from the total insured. There are some minor weaknesses, indeed, attached to the insured employed figures, the principal being that numbers of unemployed at different dates in the year are deducted from the estimated number insured in July.

Nevertheless, for the purpose of broad conclusions, the trend of the numbers of insured employed constitutes a fairly accurate guide to movements in employment.

In the table below the number of insured employed has been obtained by deducting from the estimate of the total insured popu-

* Together with the "two months" file.

† See, for example, "Memorandum on the Influence of Legislative and Administrative Changes in the Official Unemployment Statistics." Cmd. 2601.

lation in July the average unemployed in March, June, September and December of each year.*

TABLE IV.

Insured Employed Population in the Survey Region, 1923-1931.

	Males.		Females.		Total.	
	Actual.	1923=100.	Actual.	1923=100.	Actual.	1923=100.
1923 ...	765,515	100	419,021	100	1,184,536	100
1924 ...	779,330	101·8	452,045	107·9	1,231,375	104·0
1927 ...	807,042	105·4	490,747	117·1	1,297,789	109·6
1929 ...	805,478	105·2	480,508	114·7	1,285,986	108·6
1930 ...	709,414	92·7	387,395	92·5	1,096,809	92·6
1931 ...	679,319	88·7	386,145	92·2	1,065,464	89·9

It will be seen that employment in the years 1924, 1927, and 1929 was considerably above the level for the years 1923, 1930 and 1931. The year 1927, both for males and females, showed a peak, but to some degree this is attributable to temporary activity following the prolonged stoppages in 1926. If it is legitimate to take 1924, 1927 and 1929 as normal post-war years, then it appears that, within the Survey Region, employment could be found for 1,250,000-1,300,000 insured persons.

3.—The Inflow and Outflow of Labour.

The volume of occupiable labour in any area is continually subject to wastage through death, retirement, transfers to other areas, etc., and continually supplemented by new entrants into industry and transfers from other areas. Any change in the total volume, therefore, can only come about through some modification in the relative size of these outward and inward streams of labour.

At the moment there are two stages at which it is possible to measure approximately the numbers becoming available for occupation. In the first place, the number of children leaving school each year gives a fairly exact indication of the extent to which young persons become available for employment for the first time.

* In order to allow for the fact that the figures before 1927 included those above 65 years of age, the insured population has been taken as that shown in Table III. The quarterly average of numbers unemployed for the years 1923-27 has been reduced by the same percentages (3·6 for males and 0·8 for females). This assumes that the percentage unemployment among persons over 65 years is the same as that for all insured persons. It is extremely likely that the real percentage for this class is much higher than the average. To this extent, therefore, the figures of insured employed given in Table IV for the years 1923-27 are probably slightly too low. For 1923 the numbers of unemployed were available only for the last three quarters, and for 1931, for the first three quarters.

Secondly, the entrance of persons into insurance for the first time makes it possible to measure the strength of the flow at a later stage.*

Table V below shows the numbers of children leaving public elementary and secondary schools in the years 1920-1931. The area covered is the whole of Lancashire, but it is highly probable that the movements in the Survey Region have been similar.

TABLE V.

Lancashire.

Numbers of Children leaving Public Elementary and Secondary Schools. 1920-1931.

	<i>Elementary Schools.</i>	<i>Secondary Schools.</i>		<i>Elementary Schools.</i>	<i>Secondary Schools.</i>
1920-21 ...	95,688	8,075	1926-27 ...	91,143	8,768
1921-22 ...	85,599	8,916	1927-28 ...	96,105	9,560
1922-23 ...	84,710	9,562	1928-29 ...	101,144	9,405
1923-24 ...	92,062	9,518	1929-30 ...	76,565	9,117
1924-25 ...	96,679	9,263	1930-31 ...	76,446	—
1925-26 ...	95,202	9,059			

It will be seen that, up to 1929, the numbers of school-leavers tended to increase, but in 1929-30 and 1930-31, due to the abnormal decline in births from 1915 onwards, the numbers fell.

This alleviation of the employment situation is, however, not likely to be prolonged. In 1930, the National Advisory Council for Juvenile Employment made enquiries of the Local Committees for Juvenile Employment throughout the United Kingdom, and, among other information, obtained details of the numbers of boys and girls leaving school each year since 1926, and of the estimated numbers of school-leavers for each future year up to 1938. The details provided by the Local Committees in the Survey Region have been aggregated† and are shown in the table below. The figures for future years must be accepted with reserve. Apparently, in these estimates rough allowances have been made for reductions by death, but most committees appear to have made no attempt to adjust these figures for possible migration. Beyond this, the estimates were based on the assumption that the school-leaving age would be raised to 15 years as from April 1st, 1931. This very much influences the figures of school-leavers for 1931 and 1932, and to a slight degree affects the figures for subsequent years.

* But, in so far as children reach the age of 16 years and either do not find employment at all or became employed in an uninsured trade, the measurement is incomplete.

† i.e., by including all committees in Lancashire (with the exception of Barrow, Blackpool, Carnforth, Kirkham, Liverpool, Morecambe, Bootle, Ormskirk and Southport); and the following committees in Cheshire and Derbyshire: Altrincham, Ince, Glossop, New Mills, Runcorn, Stalybridge, Stockport, Bredbury and Romiley.

TABLE VI.

Estimated numbers of Boys and Girls Leaving School in the Survey Region 1926-1938, assuming raising of School-leaving Age to 15 years in April, 1931.

	<i>Boys.</i>	<i>Girls.</i>	<i>Total.</i>
1926	31,797	31,830	63,627
1927	31,047	30,441	61,488
1928	31,951	32,014	63,965
1929	33,472	32,845	66,317
1930	28,195	27,532	55,727
1931	27,069	26,375	53,444
1932	8,446	7,704	16,150
1933	24,793	24,122	48,915
1934	28,457	28,645	57,102
1935	35,563	35,078	70,641
1936	36,035	34,800	70,835
1937	33,174	32,817	65,991
1938	31,077	30,708	61,785

The table can probably be relied upon to show true general trends, assuming that no important change takes place in the migration rate up to 1938. It appears that the decline in the numbers leaving school brought some relief in the employment situation in 1930 and that this relief will continue until 1934, but that in the following years the annual flow of school-leavers into industry will be well up to the 1926-1929 level. Forecasts of this sort for any area so small as the Survey Region and for a period when rapid changes in the migration rate or important changes in the school-leaving age are possible, are naturally of limited value. But the information collected by the Local Committees for Juvenile Employment is sufficient to suggest strongly that, if all other factors remain the same, no long-period relief in the labour market can be expected from a decline in the number of those entering industry for the first time. Should, however, the school-leaving age be increased to 15, about 60,000 fewer children would leave school in the two subsequent years than did so in any two years between 1926 and 1930.

The second point at which the inflow of labour may be approximately measured is when persons enter Unemployment Insurance for the first time. The bulk of such entrants naturally consists of juveniles who have arrived at the insurable age, but some are older persons from uninsured occupations, or persons who have previously been in business on their own account or have been living abroad, or have been employed in non-manual occupations at a rate of remuneration exceeding £250 per annum. It will be seen from Table VII that the numbers of new entrants in the North-Western Administrative Division of the Ministry of Labour* (the

* In the remainder of the Report this Division will be referred to as the "North-Western Division."

TABLE VII.

*North-Western Division.**Numbers of New Entrants into Unemployment Insurance*

	<i>Period.</i>	<i>Men.</i>	<i>Boys.</i>	<i>Women.</i>	<i>Girls.</i>	<i>Total.</i>
Insurance Year	1923-4 ...	30,585	54,431	27,751	45,199	157,966
"	" 1924-5 ...	26,425	55,172	27,441	47,358	156,396
"	" 1925-6 ...	19,023	51,843	18,371	46,188	135,425
"	" 1926-7 ...	14,994	55,848	13,706	41,159	125,707
"	" 1927-8 ...	13,216	49,184	16,051	44,673	123,124
"	" 1928-9 ...	11,162	49,628	13,330	45,764	119,884
"	" 1929-30...	11,385	49,919	12,361	45,881	119,546
"	" 1930-31...	10,558	47,801	10,117	43,725	112,201

Whilst recruitment into the insured trades has been on the decline, the total number of insured persons† has failed to decline because the rate of exit or "wastage" from insurance has not been maintained. This "wastage" from insurance will frequently be referred to in later sections and may, therefore, be described in detail at this point. Each year the Ministry of Labour, by taking a count of cards in July, determines the number of insured persons in each industry and each Division. By adding to the numbers insured at any one July the numbers entering insurance for the first time during the following year and deducting from this aggregate the numbers insured at the following July, a figure of "wastage" from insurance during the year is obtained. In the case of statistics for the North-Western Division this wastage is the resultant of a number of counteracting movements. On the one hand, persons will fall out of insurance in the Division principally through death, retirement, emigration, movement into uninsured trades, or movement into other Divisions. On the other hand, this will be offset by movements of insured persons into the Division from other Divisions, and by the return into insurance of persons after having dropped out of it. The "wastage" therefore, combines a number of items which cannot be dissected. "Negative" wastage will result if the number falling out of insurance in the Division for any of the reasons stated above is more than offset by the number of insured persons moving into the Division *plus* the number of persons coming back into insurance after having fallen out.

* From January, 1925, onwards, the figures are exclusive of cases in which, as the result of systematic search, duplication of applications has been discovered.

† See Table III on p. 73.

Table VIII shows that, after 1927, there was a marked dwindling of wastage, which probably means that numbers of insured persons were deferring their exit from insurance and/or that numbers of persons were coming back into insurance after having dropped out of it.* Among men and women in the later years there was actually a negative wastage, which suggests that there was a large increase in the numbers who returned into insurance after having fallen out.

TABLE VIII.

*North-Western Division.**Wastage of Insured Persons from Insurance in all Industries.
1923-1931.*

<i>Year.</i>	<i>Men.</i>	<i>Total Males.</i>	<i>Women.</i>	<i>Total Females.</i>	<i>Total.</i>
1923-4 ...	62,775	118,626	21,051	66,240	184,866
1924-5 ...	— 6,705	46,697	10,281	55,209	101,906
1925-6 ...	— 3,177	46,966	16,971	64,559	111,525
1926-7 ...	63,584	121,282	18,586	59,735	181,017
1927-8 ...	16,446	67,880	6,221	51,434	119,314
1928-9 ...	— 1,918	45,330	6,960	49,254	94,584
1929-30 ...	—15,355	35,164	—23,419	21,992	57,156
1930-31 ...	—	—	—	—	71,091

These, then, have been the movements of the streams which determine the level of the pool of labour; a steady flow of new labour from the schools, weakened for several years after 1929, but likely to regain its volume, and in itself sufficient to increase the size of the population seeking work; at the same time a dwindling of new entrants into insured trades which is more than offset by a decline in the stream of exitants from insurance, leading to a continuous and substantial increase in the size of the insured population.

4.—Factors in Post-War Unemployment.

It now becomes possible to make a rough assessment of the normal post-war unemployment in the Survey Region; how far it is to be attributed to an actual decline in industry and trade which checked the growth in the demand for labour and how far it is due to the increase in population which has occurred in the last ten years. It must be repeated that the estimates which follow, based as they are upon the statistics in the preceding sections, necessarily suffer from whatever limitations attach to those statistics. Moreover, for the present purpose, we shall ignore the peculiar problems which have arisen since 1930, and which have

* It is extremely unlikely that large numbers of insured persons were coming into the N.W. Division from other Divisions.

forced unemployment levels to new heights. The assumption will be made that the depression in 1930-1931 is a temporary decline which has produced a volume of unemployment distinguishable from the normal post-war surplus.

It is proposed to take 1929 as the standard normal post-war year. This appears to be a legitimate assumption, for the volume of employment was approximately the same in the years 1924, 1927 and 1929. It is true that certain Lancashire industries, particularly coal and cotton, have shown since 1924 a disturbing continuous fall in production, of which more is said elsewhere. But other industries and occupations have to some degree taken up the slack created by these declines, and there is no reason to suppose that the maintenance of the normal post-war volume of employment necessarily implies that the older industries must retain their former relative importance.

The course of unemployment is shown in Table IX below. In actual numbers, males show higher figures than females. Taking the two sexes together, unemployment did not fall below 138,000 in the years for which we have information and there appears to have been a substantial increase between 1927 and 1929.

TABLE IX.

*Total Insured Unemployed Population, and Percentage Unemployment in the Survey Region, 1923-1931.**

(Percentages in Italics.)

	Males.			Females.			Total.
	Men.	Boys.	Total.	Women.	Girls.	Total.	
1923 ...	116,746 <i>13.7</i>	3,691 <i>6.2</i>	120,437 <i>13.2</i>	73,270 <i>16.4</i>	5,070 <i>9.4</i>	78,340 <i>15.6</i>	198,777 <i>14.0</i>
1924 ...	102,442 <i>12.1</i>	2,924 <i>4.5</i>	105,366 <i>11.5</i>	59,935 <i>13.1</i>	3,334 <i>5.5</i>	63,269 <i>12.2</i>	168,635 <i>11.8</i>
1927 ...	96,034 <i>11.0</i>	1,866 <i>3.2</i>	97,900 <i>10.5</i>	38,074 <i>7.9</i>	1,741 <i>3.2</i>	39,815 <i>7.4</i>	137,715 <i>9.4</i>
1929 ...	114,407 <i>13.2</i>	2,425 <i>4.2</i>	116,832 <i>12.7</i>	60,622 <i>12.4</i>	2,170 <i>4.0</i>	62,792 <i>11.6</i>	179,624 <i>12.3</i>
1930 ...	210,953 <i>24.3</i>	6,013 <i>10.5</i>	216,966 <i>23.4</i>	167,731 <i>33.1</i>	7,004 <i>12.7</i>	174,735 <i>31.1</i>	391,701 <i>26.3</i>
1931 ...	253,630 <i>28.7</i>	6,081 <i>10.9</i>	259,711 <i>27.7</i>	180,637 <i>34.8</i>	5,888 <i>10.9</i>	186,525 <i>32.6</i>	446,236 <i>29.5</i>

* Average taken of unemployment in June, September and December for 1923; March, June, September and December for 1924, 1927, 1929 and 1930; March, June and September for 1931. No allowance for exclusion of those 65 years and over in 1929, 1930, 1931.

The position revealed in the foregoing sections can now be summarised. Between 1921 and 1931 the total population of the Survey Region increased by about 2 per cent., but there is evidence that the population between 15 and 64 years of age increased at a more rapid rate. On the other hand, the insured population between 1923 and 1929 showed a 5 per cent. increase for males and a 9 per cent. increase for females, but the statistics of "wastage" from insurance suggest that part of this increase was spurious, arising from changes in the law and administration of the Unemployment Insurance Scheme. It is impossible to make an exact allowance for this factor, but the assumption will be made that the "real" increase in the number of females insured was not 9 per cent., but at the same rate as for males, 5 per cent. A broad estimate of the position in 1929 and the relation which existed, in that year, between the unemployment among insured persons and the increase of insured persons which occurred between 1923 and 1929, can now be put in tabular form.

Lancashire Survey Region, 1929.

	<i>Males.</i>	<i>Females.</i>	<i>Total.</i>
(1) "Real" Insured Population (i.e., assuming 5 per cent. increase in insured female population 1923-29).	922,000	522,000	1,444,000
(2) "Real" Unemployment among Insured ... (i.e., actual recorded unemployment, less females excluded under (1)).	117,000	41,000	158,000
(3) "Real" Increase of Insured Population 1923-29.	41,000	25,000	66,000
(4) Percentage: "Real" Increase to "Real" Unemployment.	35 per cent.	61 per cent.	42 per cent.

This estimate is only approximate. It makes no allowance for those in uninsured occupations,* those between the ages of 14 and 16 years, or those over 64 years, and it seems impossible to determine whether the situation among these groups is similar to that within the insured population. It might be urged that some deduction ought to be made from the increase of insured male population for the same reasons that a reduction was made in the case of females. On the other hand, it must be borne in mind

* Some idea of the relative importance of insured and uninsured persons may be gathered from the fact that in 1923 the insured population in the Survey Region was 1,378,351. The total population of this area in 1921 was 4,135,062. What proportion of this number was occupied is not known, but if we assume that the proportion was the same as that revealed for "Lancashire and parts of Cheshire and Derbyshire", by the Census of 1921, this would give a total occupied population of 2,042,721. That is to say that the insured population was 67.5 per cent. of the total occupied population.

that the volume of unemployment* is greater than is recorded in the Ministry of Labour Statistics of numbers unemployed. But if the assumptions which have been made above are roughly correct it appears that in 1929 about three-fifths of nearly 160,000 unemployed persons constituted the continuing surplus of labour which post-war conditions have created and two-fifths the increase in the numbers insured, which seems to be directly attributable to the growth of population. In the case of women a larger part of the surplus is due to the increase in the insured population than in the case of men.

The industrial and geographical distribution of unemployment is shown in Tables I and II in Appendix 2. Table II brings out quite clearly how unemployment has been concentrated in the cotton, coalmining, engineering and textile finishing industries. In 1929, 58.3 per cent. of the total insured unemployed population (52 per cent. of males and 70 per cent. of females) were found in these four industries. Cotton itself accounted for 34 per cent. of the total unemployed, 17 per cent. of males and 66 per cent. of females. On the other hand, it is a matter of some significance that 40 per cent. of the total unemployment was found in industries and occupations other than the four staples mentioned above.

Table I shows how widespread unemployment is in the county. It should be noted, however, that in 1929, 23.4 per cent. of the total unemployed (20.4 per cent. of males and 29.4 per cent. of females) were found in the weaving districts of Blackburn, Bacup, Burnley and Bury.

5.—The Mobility of Labour.

In view of the labour situation which has been revealed in the previous sections, it would be encouraging to find that large numbers of people have been leaving the Survey Region and seeking employment elsewhere. Far from this being the case, however, the population has shown itself to be extremely immobile. The factors which are responsible for this are connected with the special problems of the main industries in the area, and they are dealt with in detail elsewhere.

The general loss by migration as shown in the Censuses for 1921 and 1931 is as follows:—

* See p. 104.

TABLE X.

Estimated Net Loss by Migration from Lancashire, 1911-1921 and 1921-1931.

				<i>Numbers.</i>	<i>Percentage of Population.</i>
1911-21	...	...	...	163,000	3.4
1921-31	...	...	...	132,000	2.7

Even when allowance is made for the fact that the migration in 1911-1921 included large losses through war deaths which probably amounted to 40-50,000 the migration in the period 1921-31 appears very slight in the face of the continuous surplus of labour. The fact that in other depressed areas the migration rate has been much higher than in Lancashire throws into even sharper relief this failure of the population in Lancashire to adjust its size to industrial needs. Thus, in Durham and Northumberland the percentage migration in the period 1921-1931 was 9.3 per cent., and in Brecknock, Carmarthen, Glamorgan and Monmouth 12.3 per cent. To some extent the heavier migration from the North-East of England and from the Welsh coalfield must be due to the special efforts which have been made under the different Industrial Transference Schemes to reduce the surplus of labour in these areas. And, until 1930, the unemployment problem in Lancashire did not appear to be so serious, or the need for migration so marked, as in these two areas which were scheduled by the Ministry of Labour as "depressed areas" long before conditions became equally bad in Lancashire. Nevertheless, in the face of a situation in the Survey Region as serious as that shown in the previous sections, the immobility cannot be regarded as anything short of a breakdown of individual and family initiative.

There are, however, more encouraging signs in the events of the past two or three years. One is that the migration from Lancashire has apparently accelerated. Each year the Registrar-General publishes for each local administrative area the total births and deaths, together with an inter-censal estimate of the total population. It is possible, therefore—by deducting from the population of the base year and the excess of births over deaths in the period) the population as estimated by the Registrar-General—to obtain an estimate of migration. It need hardly be stressed that these estimates are liable to error, the chance of error becoming the greater as the size of the area taken becomes smaller, and as the census base year becomes more remote.* A comparison by this method of migration in the period 1921-1925 and in the period 1925-1929 shows that a very marked change has been taking place. In the earlier period, indeed, an inward migration into Lancashire is actually revealed, in the later a substantial outward movement.

* Thus the Registrar-General's estimate of the Lancashire population in 1929 was 5,089,580; the population as revealed by the 1931 Census was 5,039,097. It seems extremely unlikely that there was an actual decrease of population between 1929 and 1931.

TABLE XI.

Migration to and from Lancashire and the Survey Region.
1921-1925, 1925-1929.*

			<i>Lancashire.</i>	<i>Survey Region.</i>
1921-25	...	...	+ 18,319	+ 11,934
1925-29	...	...	- 41,532	- 12,213

* + represents a net inward, — a net outward movement.

It is more significant still to compare the total estimated migration 1921-29 with the migration 1921-31 revealed by the Census. The table above shows that the estimated net migration from Lancashire 1921-29 was about 23,000. The actual migration 1921-31 was 132,000. The suggestion is therefore strong that people were leaving the county in the years 1929-31 on a scale much more extensive than in the previous eight years.

Another encouraging sign is that, within the Region itself, there appears to have been a tendency for the decline in population, and presumably the net loss by migration, to be greatest in the case of those areas in which unemployment has been highest. In Table XII,† the various sections of the Survey Region are shown with a comparison of the average percentage unemployment 1923-30 among insured workers and the percentage change in the total population 1921-30. It will be seen that, generally speaking, the fall in population has been greatest in those areas where unemployment has been most severely felt. There are, however, some exceptions. The area covered by the Employment Exchanges of Stalybridge, Hyde, Ashton-under-Lyne, Glossop, Stockport, and New Mills, despite a high unemployment rate, has increased its population by 3.5 per cent.; but part of this may be due to an increase of the residential population and not the working population. The Chorley and Preston district provides another exception which is probably due to expansion in the Leyland district. On the whole, however, the population has been increasing most in those southern parts of the county in which unemployment has been lowest.

† The comparison can only be approximate for two reasons. In the first place, the Employment Exchange areas do not coincide with the Local Administration areas for which population figures are available, but an attempt has been made to obtain as exact a fit as possible. Secondly, for geographical comparisons of this kind, the Employment Exchange area is not a very suitable unit. Persons may live in one place and register as unemployed in another in which they work, or they may register as unemployed in an area in which they live but do not usually work. This factor has probably become of greater importance with the increased facilities for day travelling. But each area taken is probably large enough to eliminate most of this except in the margins between areas.

TABLE XII.

Average percentage unemployment of Insured Persons, 1923, 24, 27, 29, 30 and Changes in Population 1921-31 in Sections of the Survey Region.*

<i>Employment Exchange Areas.</i>	<i>Quarterly Average Percentage Unemployment, 1923-30.</i>	<i>Percentage Decline (-) or Increase (+) in Population, 1921-31.</i>
Oldham, Mossley, Shaw, Chadderton, Royton, Middleton, Failsworth.	22·6	- 2·9
Stalybridge, Hyde, Ashton - under - Lyne, Glossop, Stockport, New Mills.	18·8	+ 3·5
Blackburn, Great Harwood, Darwen, Accrington, Clitheroe.	17·9	- 2·9
Bolton, Leigh, Farnworth, Pendlebury ...	16·1	+ 0·6
Littleborough, Bury, Radcliffe, Heywood, Rochdale.	15·6	+ 0·1
Chorley, Preston	15·0	+ 5·0
Atherton and Tyldesley, Wigan, Horwich, Ashton-in-Makerfield, Hindley.	14·8	- 3·9
Burnley, Nelson, Colne	14·7	- 4·5
Bacup, Rawtenstall, Haslingden	14·2	- 1·9
St. Helens, Runcorn, Widnes, Earlstown, Warrington.	12·3	+ 6·6
Trafford Park, Eccles, Altrincham, Salford ...	12·1	+ 4·0
Manchester, Levenshulme, Denton, Openshaw, Newton Heath, Reddish.	10·9	+ 4·6
Lancaster, Blackpool, Fleetwood	9·3	+ 6·9

* Weaknesses are introduced into cols. (1) and (2) by certain changes in the areas covered by Employment Exchanges since 1923. Two of these changes are important:—(a) in October, 1923, Ashton-in-Makerfield assumed the status of an Employment Exchange; previous to this it had been a Branch Employment office of the St. Helens Exchange; (b) prior to 1924, Mossley was a Branch office of Stalybridge; after 1924, it became an independent Employment Exchange.

There can be little doubt that, as a result of these movements, the industrial centre of gravity in Lancashire is changing. The decline of the cotton industry has reduced the importance of the isolated north-eastern cotton towns and industry is again tending to concentrate around Manchester and along the line between Manchester and Liverpool. The population movements which accompanied industrial expansion in the nineteenth century are being reversed. In Table XIII, a comparison of insured employed for the years 1923, 1929 and 1930 in the different areas reveals this trend in a degree which is exaggerated by the abnormal unemployment in the cotton industry in 1930.

TABLE XIII.

Percentage Geographical Distribution of Insured Employed Persons 1923, 1929 and 1930.

<i>Area.</i>	<i>1923.</i>	<i>1929.</i>	<i>1930.</i>
Blackburn, etc.	8·9	8·3	6·8
Burnley, etc.	6·1	6·2	5·4
Rochdale, Bury, etc.	7·3	7·3	6·8
Bacup, etc.	2·2	2·0	1·9
Oldham, etc.	7·3	8·0	6·8
Preston and Chorley	5·2	5·0	5·3
Bolton, etc.	9·0	8·6	8·5
Wigan, Atherton, etc.	7·6	5·7	6·2
Stalybridge, etc.	7·3	7·1	6·4
Manchester, etc.	22·0	24·0	26·1
Trafford Park, etc.	7·6	8·2	9·1
St. Helens, Runcorn, etc.	6·4	6·3	6·8
Lancaster, Blackpool, etc.	3·1	3·3	3·9
Survey Region	100·0	100·0	100·0

6.—Summary.

To sum up regarding what may be termed the normal post-war problem of unemployment in the Survey Region up to 1929: two parts of the surplus labour in the area can be attributed to an increase in population and three parts to unemployment that would have existed even if the industrial population had not increased. A return to 1929 levels of activity would still leave unabsorbed about 160,000 insured persons and the figure might be substantially increased if allowance were made for certain forms of unrecorded unemployment. Unemployment is heavily concentrated in the cotton industry and those industries dependent upon it such as textile engineering and finishing, and in coalmining. Apart from industrial expansion beyond the 1929 level, a reduction in this surplus could come only through a fall in the numbers entering industry or through the transfer of labour to other centres. But, unless some change takes place in the school-leaving age, or in the rate of migration, no great permanent relief can be expected from a reduction in the number of children leaving school. Moreover, the population since 1921 has shown a disquieting immobility, probably unparalleled in any other depressed industrial area in the country, although there are signs that migration has been speeded up in the past year or two.

CHAPTER 3.

THE INDUSTRIES OF LANCASHIRE.

It is not easy to give in summary form any adequate impression of the concentration, diversity and complexity of the vast accumulation of industries within the Survey Region, and it is even more difficult to trace the numberless relations between the different forms of economic activity which are carried on. The following

description will be confined to making clear three characteristics of the Region which are not always recognised: first, the density of the industrial concentration within this small area; secondly, the immense variety in the nature of the manufacturing industries; and thirdly, the progress which many "new"* and small industries have been making since the end of the War.

1.—The Concentration of Industry.

In June, 1929, of the total insured employed population in Great Britain and Northern Ireland nearly 12 per cent. was found in the Survey Region, and, if manufacturing, building and mining industries alone are considered, the Region held 14 per cent. of the total.† The converse of this is found in the relative insignificance of agriculture, for, according to the 1921 Census, only 2 per cent. of the occupied population in "Lancashire and Parts of Cheshire and Derbyshire" was so engaged.

There is no exact information of the output of the Region, but, from the Census of Production, it appears that the larger area "Lancashire with North Cheshire and the Glossop and New Mills Districts of Derbyshire"‡ accounted in 1924 for 20 per cent. of the total employed persons, 22 per cent. of the gross output and 19 per cent. of the net output for the whole of the United Kingdom.§

2.—The Diversity of Industry.

The size and relative importance of certain staple industries in the Region—such as cotton, engineering and coalmining—have tended to focus attention upon these and throw into unmerited insignificance a host of extremely important industries of other types. If, for example, the Ministry of Labour classification of 101 industries be taken it is found that in the Survey Region in 1929 there were 58 "manufacturing" industries with more than 1,000; 47 with more than 2,000; 34 with more than 5,000; and 15 with more than

* This term "new" industry will be used throughout this chapter to mean, not an industry which is meeting an entirely "new" want, but one which has expanded considerably through changes in the volume and character of demand. It would, indeed, be very difficult to discover a "new" industry in the narrower meaning of the term. Even in such industries as electrical engineering, wireless and road transport, there has presumably been an "industry" catering for these needs for 30-40 years at least, but the modern industry in these cases is so different from that at the much earlier period that it is justifiable to assume that a radical change of economic significance has taken place. Similarly, of course, it might be argued that every industry is "new" in the sense that the kinds of things being produced are constantly changing. The distinction between "new" and "old" is therefore arbitrary, of degree and not of kind.

† Details will be found in Appendix 3, Table II.

‡ For the purposes of the Census of Production "Lancashire with North Cheshire and the Glossop and New Mills Districts of Derbyshire" includes the whole of Cumberland and Westmorland.

§ Details will be found in Appendix 3, Table III.

10,000 insured employed persons.* This, of course, is in addition to the service industries engaged in the transport of goods and the housing and amusement of the population.

Many of these industries in the Region are extremely important in relation to the national industry. The following 26 manufacturing industries had more than 10 per cent. of the total insured employed persons in Great Britain and Northern Ireland at July, 1929: Artificial Stone; Glass; Glass Bottles; Chemicals; Oil, Glue, Soap, etc.; Wire and Wire Netting; General Engineering; Electrical Engineering; Railway Carriages, etc.; Electric Cables; Cotton; Silk and Artificial Silk; Hemp, Rope, etc.; Miscellaneous Textiles; Textile Finishing; Tanning, etc.; Tailoring; Hats and Caps; Shirts, Underclothing; Bread, Cakes, etc.; Wood boxes, etc.; Paper and Paper Board; Cardboard boxes; Wallpaper; Rubber; Oilcloth, etc. Some of these are really national industries highly localized in Lancashire. Cotton in the Survey Region accounted in 1929 for 84 per cent. of the total for Great Britain and Northern Ireland; and other industries: Glass (37 per cent.), Glass Bottles (28 per cent.), Wire and Wire Netting (34 per cent.), Textile Finishing (43 per cent.), Hats and Caps (32 per cent.), Wallpaper (29 per cent.), Rubber (24 per cent.), and Oilcloth, etc. (36 per cent.), reveal impressive relative figures.† If the 1924 Census of Production figures are taken, a similar position is revealed in "Lancashire with North Cheshire and the Glossop and New Mills Districts of Derbyshire", for this area accounted for 43 per cent. of the net national output of Textiles; 29 per cent. of Chemicals; 26 per cent. of Leather Manufacture; 16 per cent. of Food Manufacture; 15 per cent. of the Iron and Steel Trades; 14 per cent. of Clothing; and 14 per cent. of Paper.‡

An important corollary emerges. Lancashire is not so wholly dependent upon its staple industries as is commonly imagined. It is impossible, of course, to deny the great influence which the fortunes of the cotton industry have upon general conditions in the Region, and the activities of this industry are closely intertwined with those of numerous subsidiary industries, such as textile finishing, textile engineering, and chemicals. But even if all those employed in cotton manufacture, textile finishing and textile engineering are grouped together, they probably accounted for no more than about 45 per cent. of those employed in manufacturing industries in the Region in 1929. Further, the insured employed in the three great staple Lancashire industries—cotton, engineering and coalmining—only comprised 56 per cent. of the total insured employed in all manufacturing industries in 1929. Industrial Lancashire is, therefore, not so specialised nor so "unbalanced" industrially as might be imagined. It is true that an

* See Appendix 3, Table I.

† See Appendix 3, Table I.

‡ See Appendix 3, Table III.

equal variety and range of occupations is not found in every part of the Region, for, as has already been shown,* certain sections of it are intensely specialised, and the industries other than cotton are largely grouped in the southern section. But, taking the Region as a whole, it includes, often on a large scale, almost every important branch of manufacturing activity, and the "other industries" find employment for almost as many workers as do cotton, coal and engineering.

From one angle, however, Lancashire industry may be regarded as vulnerable because of its dependence upon the export trade. It is, unfortunately, impossible to give any exact indication of the proportion of Lancashire's industrial products which is sold abroad, but it appears to be high. The cotton industry is sufficiently highly localised in the Survey Region to make the national figures indicative of conditions in the Region. According to the Census of Production, the factory value of the exports of cotton manufactures in 1924 was 70-72 per cent. of the value of the goods made, and this figure was only slightly lower than the corresponding one for 1907. Between 1924 and 1930 there appears to have been little change in the relative importance of the export trade. The collapse of foreign markets in 1931 probably increased the proportion of total output taken by the home market but this can perhaps legitimately be regarded as a temporary condition.

The coalmining industry of Lancashire and Cheshire has always been regarded as a non-exporting industry, largely because the collieries are often tied to concerns engaged in other industrial processes and because of the large home demand for industrial and domestic purposes. Whilst exports from many other coalfields are proportionately higher than those from Lancashire, yet there appear to be considerable exports from the county, particularly to the Irish Free State. The nearest statistical estimate that can be made is to show the relation between the production of the Lancashire and Cheshire coalfield and the exports of coal from Lancashire and Cheshire ports. In the years 1924-30, the exports of coal—bunkers and cargoes—from Lancashire and Cheshire ports were slightly over 20 per cent. of the total output of the Lancashire and Cheshire coalfield. Of course, some coal from other producing centres is included in these exports.

In textile engineering, for the whole of the United Kingdom, the Census of Production shows that in 1924, 60 per cent. of the total production, by value, was exported, and the figure is not likely to be very different for the Survey Region which contains the larger part of the country's textile engineering. In other branches of the general engineering industry, such as the production of machine tools, boilers, prime movers and locomotives, and in electrical engineering, there is considerable export, but it is not possible to give any quantitative estimate of it.

* See p. 13.

In clothing, the great bulk of the product is sold in the home market, although the export trade is expanding. In hat manufacture, however, there are very large exports, but the proportion of the total production sold abroad is lower than before the War.

It is impossible to measure the relative importance of production for export and production for the home market in the chemical and allied trades as a whole in the Region. No generalisation could hope to apply to all sections of such a heterogeneous group of industries and to all the items of their highly diversified product. It appears, however, that production *directly* for export is only a relatively small proportion of the total output, but that production of chemicals for use in the exporting industries of the Region—e.g., dyes, and textile “preparation” and finishing chemicals for the cotton industry—is a very important function of the chemical industry in the Region.

3.—The Expanding Industries.

It has become common to argue that new industries are not likely to develop in Lancashire because it is declining in industrial importance, because trade union restrictions are burdensome, because rates are high, or for other reasons, all of which imply that the Region has become unsuitable or inconvenient for these new and smaller industries which have developed in England since the end of the War, usually to cater for the home market, and which, for the most part, are dependent upon recent changes in tastes and habits of living. A depressing picture has been created of a region losing the support of its major industries and ignored by the newer and smaller industries.

Nothing could, however, be further from the truth so far as the new industries are concerned. In Table I* a comparison is made between the Survey Region and the whole of Great Britain and Northern Ireland, of the progress of all those industries which showed at least a 10 per cent. increase in the number of insured employed between June, 1923, and June, 1929, in Great Britain and Northern Ireland. It will be seen that, taking these 42 industries together, the expansion 1923-29 was 28.7 per cent. for the Survey Region and 28.2 per cent. for Great Britain, but the depression in 1930 and 1931 appears to have hit Lancashire rather harder than the whole country. It was only to be expected that in the “service” industries—transport, distribution, amusements, etc.—the growing population in the Region would require increasing numbers of persons to cater for the swelling demand. But even in Silk and Artificial Silk, Electrical Engineering, Electric Cables, Constructional Engineering, Hosiery and many others, the percentage increase in Lancashire has not fallen behind the national increase.

* See also Appendix 3, Table IV.

TABLE I.

*Forty-two " Expanding " Industries.**Insured Employed at June, 1923-29-30-31, in Survey Region
and in Great Britain and Northern Ireland.*

	Numbers.				1923=100.			
	1923.	1929.	1930.	1931.	1923.	1929.	1930.	1931.
Survey Region.	356,303	458,632	447,981	453,817	100	128·7	125·7	127·4
Gt. Britain and N. Ire- land.	4,368,849	5,598,751	5,600,084	5,673,613	100	128·2	128·2	129·6

It is misleading, therefore, to regard the Survey Region as one which has become unsuitable for employers seeking locations for their plants. But it would be equally misleading to ignore a further point which emerges from the same Table and which constitutes an important factor in the post-war difficulties of the Region. Whilst the expansion of these industries in the Region has on the whole kept pace with movements elsewhere, the relief provided has not been great, partly because all such industries are small in relation to the great exporting industries and partly because the Region, in 1923, had only a very small proportion of these industries.

To take these points in turn. The expanding industries are small in relation to the staple industries in the Region. Even in 1929 the growing industries only employed 35.6 per cent. of the total insured employed persons. Whilst the expansion in employment in them between 1923 and 1929 was 102,000, the numbers recorded as unemployed in all industries in the whole of the Survey Region never fell below 138,000. It is obvious, therefore, that the relief obtained in this way has not been sufficient to solve the unemployment problem. Secondly, it is extremely unfortunate that these expanding industries were, in 1923, relatively less important in Lancashire than in the rest of the country. In 1929 the Survey Region contained 11.8 per cent. of the total insured employed population of Great Britain and Northern Ireland, but only 8.2 per cent. of the insured employed persons in these expanding industries. The result has been that a large percentage increase in employment has not led to such an aggregate increase as would have occurred if these industries had been more strongly localised in the Survey Region.

A second fact which must be kept in mind in attaining the right perspective regarding the growth of new industries in the Region is that this growth is concentrated largely in the south of the Region and that there appears to have been little development in the northern cotton areas. Unfortunately, it has not been possible to

obtain sufficiently detailed statistics to measure the growth between 1923 and 1929 of the 42 "expanding industries" in the different parts of the Region. But in Table II, the percentage increase of insured employed in each sub-area, for all industries other than Cotton and Textile Finishing, is shown. It will be seen that by far the largest increase is to be found in the Manchester area. The Blackburn, Bacup and Bury districts show either a decline or only a slight increase in employment alternative to cotton. Of the northern areas only Burnley shows any important increase. Taken in conjunction with the extremely heavy unemployment in these northern districts,* this absence of expanding outlets for cotton workers is a matter of the greatest significance.

TABLE II.

Percentage Increase or Decrease between 1923 and 1929 of Insured Employed Persons in all Industries, other than Cotton and Textile Finishing, in each Sub-Area† of the Survey Region.‡

Blackburn, etc.	0.1
Bacup, etc.	4.6
Bury, etc.	1.4
Burnley, etc.	6.2
Stalybridge, Hyde, etc.	5.0
Bolton, Leigh	3.8
Oldham, etc.	9.9
Atherton, Wigan, etc.	25.1
St. Helens, etc.	2.7
Chorley, Preston, etc.	4.3
Lancaster, etc.	11.6
Trafford Park, etc.	14.4
Manchester	14.7
Survey Region	5.0

4.—Summary.

To sum up : the Lancashire industrial area has a more balanced industrial system than is apparent at first sight. The web of specialised services in transport, distribution, commerce and finance which has in large measure been provided to meet the needs of the staple industries has created an environment which other industries have found favourable for production, and these services, together with the market provided in the shape of the six million consumers in Lancashire and Cheshire, should continue to constitute a powerful magnet to industries. It is true that the dependence of the Region upon export trade is still great, though perhaps less than

* See p. 86.

† The Sub-Areas are shown in the map facing p. iv.

‡ The movements in certain of the areas can be explained by peculiar conditions. Thus, the decline in Atherton, Wigan, etc., must be due almost wholly to a shrinkage in the coal mining industry and this factor must also have operated in the Bolton and Leigh district.

formerly. Looking at the area as a whole, however, it constitutes a highly integrated system for varied industrial processes, which is exerting its attraction upon newer and smaller industries, not formerly important here, and which has embodied national wealth within it, in the shape of the semi-permanent equipment of society, so great that it would be wasteful, from a national point of view, to allow it to fall into disuse.

CHAPTER 4.

THE COTTON INDUSTRY.

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I.—Introduction.

It is not intended in this chapter to cover the whole range of industrial and labour problems relating to the cotton industry. Since the end of the War the industry has been subject to constant investigation, and certain facts have been established which are now beyond dispute relating to the extent of the depression in the industry; the markets in which trade has been lost; the competitors who have been responsible for the loss; and the changes in structure which the industry has, in consequence, undergone. On most of these matters continuous enquiries are undertaken by such bodies as the Cotton Trade Statistical Bureau and we could have nothing to add to the information which would be available from these sources. This chapter confines itself to the specific problem of labour surplus and the factors directly bearing upon it.

II.—The Nature of the Labour Force.

The labour force in the Lancashire cotton industry shows certain peculiarities in its sex, age and marital constitution which are widely recognised and frequently referred to, but which it will be convenient to summarise here since they react upon every

aspect of the present conditions in the labour market, and have particular bearing upon the question of the existing surplus of labour. These peculiarities may be grouped under three heads: the preponderance of female workers; the extent to which women continue in the industry after marriage; and the large number of families which rely upon a joint income to which the wife and other female members of the family are contributors.

Women very much outnumber men. Roughly speaking, there are seventeen insured women workers to every ten men in the cotton industry in Great Britain, whereas in all those industries which come under the Unemployment Insurance Acts, there are only four women to every ten men. This predominance of females is largely due to their outnumbering men in the weaving industry, but, according to the Census of 1921, they also surpass in number the males in the spinning section of the industry.*

The second marked characteristic is the frequency with which women continue in employment after marriage. The Census of 1921 shows that 28 per cent. of the females occupied in textiles in the Lancashire industrial area were married, whereas, for the whole of England and Wales, only 14 per cent. of females in all occupations were married.† There is some evidence that the depression since 1921 has resulted in a disproportionate increase in unemployment among married women workers.‡ But even if, in effect, the contraction of the industry is forcing large numbers of them permanently out of employment, it is certain that their numerical importance is still great. Their presence naturally raises serious issues. They make for labour immobility in a two-fold fashion, for, whilst they themselves are naturally attached to the home, they help to create the "family income" which acts as an anchor against labour transference. Since their employment coincides with widespread unemployment among men, the question is naturally raised as to how far a conscious policy could be justified of displacing them for the benefit of men, and this, in turn, is bound up with the adjustments in methods of production and payment of wages which would be necessary if the wages of men were to be raised to the point at which married women would no longer need to seek industrial employment.

The third peculiarity, the reliance on a joint income, is attributable to a number of overlapping factors all of which are related to the fact that many of the present standard occupations in the cotton industry are women's occupations. The industry, indeed, finds itself in economic surroundings and has adopted an internal structure which make the family income almost inevitable. The simplest case of this joint contribution to family income is where different members of the same family are engaged in the same

* The details will be found in Tables I and II of Appendix 4.

† See Table III of Appendix 4.

‡ See p. 120. The possible effects of future technical changes upon the employment of women is dealt with on p. 131 et seq.

occupation, e.g., weaving or spinning. But this is perhaps less common than is imagined, since weaving is principally a woman's occupation and spinning a man's.* In some cases, however, though these are probably declining in number, the "mixed" firm—both spinning and weaving—provides the opportunity for family employment. A further factor is the importance of the subsidiary and intermediate processes in the industry. It is erroneous to think of the workers in the cotton industry as consisting almost wholly of spinners and weavers, for the numbers engaged in subsidiary processes, which must be carried on with these two main processes, are very large, both relatively and absolutely. According to the Census of 1921,† less than one-half of the total males occupied in textiles in Lancashire were spinners, piecers or weavers, whilst only slightly more than one-half of the females were in these occupations. Among men, foremen and overlookers constituted 9 per cent. of the total, whilst among women, card, comb and frame tenters and box minders, and winders, reelers, beamers and warpers accounted for 12 per cent. and 17 per cent. respectively of the total. Now the great bulk of spinners and piecers are males, but preparatory to spinning are carding and other operations which mainly employ women.‡ The very important processes of winding, reeling, beaming and warping are carried out almost equally by spinning and weaving concerns, and since these processes are largely female occupations, this further increases the number of females employed in the spinning section of the industry. On the other hand, in the weaving section of the industry there are very large numbers of male overlookers, so that the balance between male and female workers in the weaving section is partially restored. The net effect is that the sharp geographical and technical specialisation of spinning and weaving, so often referred to, does not lead to one-sex employment in either area. Finally, this dovetailing of the occupations of men and women is made more complete through the relation between the cotton industry and other industries in the county. Coal and engineering both employ large numbers of workers who are mostly men. In certain areas, therefore, as in the Wigan and Leigh coal-mining district, or in the Preston district where men are employed in engineering, etc., the family income is the result of the coincidence of complementary industries.

Enough has been said to show how the family income has been made possible among workers in the cotton industry, and how the forces which produced it are embedded in the technical conditions of the industry.

The social results have naturally been marked, and they extend into fields which cannot be considered here. But one outstanding

* Although, of course, in ring spinning women are largely employed.

† See Table IV of Appendix 4.

‡ See Table V of Appendix 4.

economic result must be noticed : this joint family employment has made for extreme labour immobility. The problem of industrial transference, under such conditions, becomes one of encouraging the movement of families, in which some members may be employed and others unemployed. The impulse among young unmarried adults to move from a depressed area is considerably lessened since there is always the family to fall back upon. Further, the transference of young children from depressed areas to prosperous areas and industries through the movement of families is checked, and the conditions of depression are aggravated by the undiminished supply of new labour coming into the market.*

These, then, are the outstanding features of the labour force in the Lancashire cotton industry which developed as a result of pre-war conditions. With these in mind, the next step is to turn to the history of the past decade to enquire how far the depression has modified the volume and nature of this labour; how far unemployment can be attributed to these features; and to what extent those technical methods of production which, in the past, have demanded one type and volume of labour may be modified and consequently vary the nature and volume of labour required under new conditions.

III.—The Course of Production and Employment. 1923-1930.

Indices of production in the cotton industry suffer from many limitations.† They relate to the whole of the United Kingdom, and, although the Survey Region includes the great bulk of the cotton industry in the United Kingdom,‡ movements within it may have been different from movements outside. Beyond that, they are based upon the consumption of cotton—and so constitute indices for the spinning section of the industry rather than the weaving section. But, even for this purpose, they necessarily suffer from the drawback that no allowance can be made for changes in the quality of production, which is closely bound up with the amount of employment available per unit of output. It appears, however, that since 1924, there have been fluctuations with peaks in 1925 and 1927, but that these fluctuations have taken place along a slightly downward trend to the end of 1929, when, of course, the world depression caused a very sharp drop in 1930 and 1931.

* See p. 123 et seq.

† See p. 129.

‡ From time to time it will be necessary to draw conclusions regarding the cotton industry not from the industry in the Survey Region but from that in the North-Western Employment Exchange Division or in Great Britain as a whole. It is important, therefore, to notice what proportion of the industry falls within the Survey Region. In July, 1930, of a total of 564,000 insured persons in the cotton industry of Great Britain and Northern Ireland, 467,000 (82·8 per cent.) were found in the Survey Region. Of a total of 509,000 in the N.W. Division, 91·7 per cent. were in the Survey Region.

TABLE I.

Estimated Production of Cotton Yarn in the United Kingdom

<i>Million lbs. 1924=100.</i>			<i>Million lbs. 1924=100.</i>				
1924	...	1,350	100	1928	...	1,300	96
1925	...	1,520	113	1929	...	1,270	94
1926	...	1,290	96	1930	...	920	68
1927	...	1,430	106	1931	...	934	69

* Reproduced by permission of the Cotton Trade Statistical Bureau.

The statistics of employment of insured persons in the cotton industry of the Survey Region do not show quite the same movements as those of production. The year 1927 is still shown as a peak year, but whereas employment is shown as rather higher in 1929 than in 1924, production in 1929 is about 6 per cent. below that in 1924. No conclusion can be drawn from this divergence. The figures cover different areas and both series are subject to error, and it may be that changes in the quality of production have modified the relation between employment and output.

Table II shows that in the "normal" post-war years of 1924 and 1929, about 400,000 insured persons were employed—about 250,000 females and 150,000 males—whilst in the good year of 1927 the total figure was increased by 30,000. Again, the years 1930 and 1931 reveal a marked decline.

TABLE II.

*Numbers of Insured, Unemployed, and Employed Persons in the Cotton Industry in the Survey Region. 1923-24, 27, 29, 30 and 31.**

	Number of Persons Insured.			Number of Insured Persons Unemployed.†			Insured Employed Persons.		
	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.
1923 ..	166,481	293,203	459,684	28,848	69,811	88,659	137,633	233,392	371,025
1924 ..	165,887	300,114	466,001	22,145	43,246	65,391	143,742	258,668	400,610
1927 ..	170,840	301,147	471,987	14,761	25,468	40,229	156,079	275,679	431,758
1929 ..	170,370	296,820	467,190	20,718	42,292	63,010	149,652	254,528	404,180
1930 ..	166,450	303,710	470,160	65,330	133,695	199,025	101,120	170,005	271,125
1931 ..	162,780	300,850	463,630	65,413	135,494	200,907	97,367	165,356	262,723

* The methods adopted in determining the numbers of employed insured persons are those explained on page 74, and the limitations of these statistics, there referred to, must be borne in mind. In making allowance for the exclusion of persons over 65 years of age after 1927, use was made of the results of a Sample Enquiry carried through by the Ministry of Labour in 1926, which showed that 2.5 per cent. of the total male insured population and 0.7 per cent. of the total female insured population in cotton was above 65 years of age. Deductions for the years 1923-27 have correspondingly been made both from the total insured population, and the insured persons recorded as unemployed. It should also be remembered that juveniles (14-15 years) are excluded from the figures and no allowance is made for unrecorded under-employment.

† Average taken for June, Sept. and Dec. of 1923, for Mar., June, Sept., and Dec., of 1924, 27, 29 and 30, and for Mar., June and Sept., of 1931.

IV.—The Normal Post-War Surplus of Labour.

In the attempt to give a rough indication of the permanent surplus of labour in the cotton industry, the procedure followed in Chapter 2 will be adopted of taking the position in the year 1929 as typical of post-war conditions.

In this case, however, the year 1929 cannot be taken as "normal" with as much confidence as in Chapter 2, and it becomes necessary to consider how far any estimate based upon the conditions in that year truly represents anything permanent in the industry.

There appear to be certain indications that since 1924 the cotton industry has followed a slow downward trend, which, if it were continued through the present depression and into the revival which is expected ultimately, would render over-optimistic any estimates based on 1929. Reference has already been made to the course of production since 1924 with its minor peaks on a slightly falling level.* The year 1927 was one of recovery after the stoppages of 1926. But even in 1929 the movements of the numbers unemployed showed an ominous upward trend in relation to 1928.†

TABLE III.

Three-monthly Average of Numbers Unemployed among Insured Workers in the Cotton Industry in Great Britain and Northern Ireland. 1929 as a percentage of 1928.

				1928.	1929.
1st Quarter	...	...	...	100	123·4
2nd "	...	...	...	100	124·8
3rd "	...	...	...	100	90·8
4th "	...	...	...	100	108·4

Further, the cotton industry appears to be showing much less resiliency in the face of the depression than industry in general. It was only to be expected that the general depression would hit the industry severely. But it has done more than this. It has produced unemployment on a scale which amounts almost to the paralysis of the whole industry. The percentage unemployed in July, 1929, was 14.5 per cent.; by September, 1930, it had risen to 44.4 per cent., and rose still further in the first three-quarters of 1931. When this increase is compared with the movements in other staple industries the presumption is strong that the cotton industry ranks among those industries which have shown the most marked collapse during 1930-1931.‡

* See page 97.

† This cannot be attributed to an increase in the total of insured persons attached to the industry, for the total insured in Great Britain and Northern Ireland at July, 1929, was 554,790 as against 553,970 at July, 1928.

‡ It must be borne in mind, however, in comparing cotton and other industries that the impact of political conditions in China and India upon the cotton industry has been particularly severe. Moreover, there has been some improvement in cotton since this country went off the gold standard. See Part I, Chap. 4.

TABLE IV.

*Insured Employed Persons in the Cotton and Other Industries
in Great Britain 1928-1931.*

July 1928 = 100.

July.	Cotton.	Ship- building.	Wool and Worsted.	Coal- Mining.	Steel Melting, Rolling Mills, etc.	Building.	Chemicals	All In- dustries
1928	100	100	100	100	100	100	100	100
1929	99.4	107.8	96.0	106.6	103.0	102.7	105.2	103.0
1930	68.5	96.5	84.9	99.7	90.6	98.7	96.7	93.9
1931	67.9	57.6	74.8	81.8	62.6	95.5	85.0	94.9

There are so many imponderables involved in determining whether 1929 is or is not "normal" in relation to the future, that a mere recital of them is sufficient to show how futile it would be to do more than regard 1929 as normal in relation to what preceded it rather than what has followed or will follow.

It is often argued, for example, that the chief difficulties of the cotton industry in export markets are non-economic, such as the boycott in India or the political instability in China, and that these may disappear. These are questions on which it is quite impossible to speak with certainty. Again, it might be urged with some justification that the decline in output and employment has been due partly to the reluctance of the industry to curtail its machine capacity and adopt those methods of amalgamation, production, and management which would lead to lower costs, and that since the industry now has a clearer view of what is required in the present emergency and is on the point of adopting some of these remedies, the position will tend to improve.

There are, however, several factors which make it doubtful whether the industry will ever provide a larger volume of employment than it did in 1929. Firstly, amalgamation and elimination of surplus machine capacity will not, of itself, increase employment in the immediate future. Indeed, the process of reducing costs naturally looks to the elimination of short-time working by a large number of plants, and the full-time running of a smaller number, and whilst this need not reduce the real volume of employment it will throw more people completely out of work, and will translate forms of unemployment which are at present unrecorded into recorded forms.* In the long run, of course, the attainment of a measure of stability in the industry by means of the elimination of surplus capacity, the restoration of margins to a profitable level and the creation of large amalgamations may, through the commonly predicated

* See page 104.

economies of large-scale production, the increased capital available for mechanical re-equipment and the increased funds which may be devoted to scientific research, so increase efficiency that costs and prices will fall and output and employment increase. But the economies of large-scale production often tend to be exaggerated and the process of controlling surplus capacity may be often costly.

Secondly, it must not be overlooked that, serious as unemployment was in the industry up to the end of 1929, it would have been much heavier had goods always been sold at a profit. It is not possible to determine what proportion of the cotton goods sold in the years 1921-1929 was actually sold at a loss. It is obvious, however, that the intense internal competition within an industry suffering from perhaps 30 per cent. over-capacity has led to price cutting and so to a larger volume of employment than could have been provided on a profitable basis.

Finally, there is the influence which technical changes are likely to exert upon the number of workers required. A great deal of attention has been devoted to this question, and the results are described elsewhere.* Summarised, they amount to this. During the last ten years, technical changes have not been important enough to modify substantially the relation between output and employment. Still, experiments are being carried out very widely in the industry and some of the methods and machines now being tried will probably be adopted on a scale which will appreciably affect the output-employment relation and modify the nature and the volume of the labour required.

Whatever may be the truth in these matters, and for the most part this is not capable of determination by a statistical approach, it is necessary to make the point that there are immense and incalculable forces operating to determine the future of the cotton industry, and that any measurement at a point in time is, in consequence, a shot at a moving target.

(a) *The General Surplus in 1929.*

Between 1923 and 1931 the total number of insured persons in the cotton industry in the Survey Region did not change greatly, the numbers in 1931 being about 4,000 above those in 1923, although the number of females increased by nearly 8,000.† Changes in the numbers of insured employed persons have, therefore, largely been the outcome of changes in the recorded unemployed.

* See page 131.

† See Table II on page 98.

The difficulties innate in the interpretation of the Ministry of Labour statistics of numbers insured and unemployed have been referred to earlier*, but they are of particular importance in the cotton industry because of the prevalence of married women workers and the peculiar problems which arise in assessing their availability for and willingness to work.

In arriving at the estimate, given below, of the general surplus of labour in 1929, the figures of insured unemployed persons as given by the Ministry of Labour have been used. But one factor must be borne in mind which affects the validity of this estimate. From 1923 the rate of "wastage" from insurance of persons in the cotton industry fluctuated considerably, but, on the whole, up to 1928 it compared favourably with the rate in other industries.†

TABLE V.

Percentage "Wastage" from Insurance of Persons in the Cotton Industry. North-Western Division.

	<i>Males.</i>	<i>Females.</i>	<i>Total.</i>
1923-24	9.6	8.0	8.6
1924-25	1.8	5.5	4.2
1925-26	3.4	5.1	4.5
1926-27	9.5	7.0	7.9
1927-28	6.8	6.3	6.5
1928-29	2.9	5.3	4.4
1929-30	5.6	-0.03	2.0
1930-31	6.8	5.9	6.2

It will be seen, however, that in 1928-29 and 1929-30 there was a sudden drop in the percentage of insured persons passing out of insurance, which means either that an abnormally large number of persons came back into effective insurance‡ who had passed out of it, or that the numbers stepping out of insurance by starting businesses of their own, emigrating or moving out of the N.W. Division or (in the case of non-manual workers) passing beyond the £250 income limit were abnormally small. Whatever the cause and whatever the factors concerned, the net effect was to reduce the rate of exit from the industry. This slowing up of "wastage," in so far as it represents a slowing down of emigration, a decline in the number of private businesses set up, or the reduction of the numbers of non-manual workers passing the £250 limit, constitutes an increase in the insured population only to be expected in a period of trade depression. But, on the other hand, some part

* See page 74 et seq.

† See page 79, for an explanation of the term "wastage."

‡ i.e., lifted their Unemployment books from the "Dead File" or from Kew.

of this "banking up" of the insured population probably represents cases where changes in the conditions to be satisfied for the receipt of benefit brought back persons who, under the old conditions, had ceased to register for employment at the Exchanges. Such persons, of course, tend to swell the apparent volume of unemployment.

If, now, the position in 1929 be taken, the "surplus" of insured persons in the cotton industry of the Survey Region would be roughly :—

Males	...	...	21,000
Females	...	...	42,000
Total	...	...	<u>63,000*</u>

* These figures are derived from the Ministry of Labour statistics of unemployment in the industry which are summarised in Table II on p. 98. No allowance has been made for the artificial expansion of the apparent volume of unemployment due to the decline in the rate of wastage from insurance.

These figures do not represent the total unemployment in the industry. It is worth while repeating that they are based upon the average of the numbers of "books lodged" at four dates, one in each of the months March, June, September and December,† and that there is a number of types of unemployment which they do not pretend to include. In the first place, juveniles 14-15 years are omitted. The number of these is not likely to be large. The average number of unemployed juveniles 16-17 years in the cotton industry of the Survey Region in 1929 was only 1,900, although there is a tendency for this figure to be on the low side.‡ According to the 1921 Census, the total number of juveniles of 14-15 years, occupied in the cotton industry of England and Wales, was 47,813 as against 48,761 so occupied between the ages of 16 and 18 years. There is no reason to believe that the numbers unemployed in the lower age group will be greater than in the higher.

Secondly, some allowance should be made for those persons over 65 years who are unemployed. This number, too, will be small since insured persons on reaching 65 now receive Old Age Pensions. The 1926 Sample Enquiry showed that, of the total insured persons in the cotton industry, 2.5 per cent. of the males and 0.7 per cent. of the females were 65 years or over, and the 1921 Census that,

† For the Survey Region these are the only dates for which figures are available. They probably constitute, however, a satisfactory average for the whole year. Thus, if the whole of the cotton industry in Great Britain be taken, the average of the numbers unemployed at the four dates in March, June, September and December, 1929, was 72,361. The monthly average over the whole year was 72,965.

‡ See page 111.

of the total occupied in the cotton industry in England and Wales, 1.6 per cent. were above this age. The unemployment rate among these older persons is likely to be very high, but perhaps an addition of 2-3 per cent. to the total unemployment would probably cover this item. Thirdly, there would be some unemployment in the industry among non-manual workers who were above the £250 income limit and therefore were not insured, but it does not seem possible to make any calculation of its numerical importance. The number unemployed, however, cannot have been large. Finally, there appears to have been a good deal of unemployment in the cotton industry which did not take forms in which it would be recorded by the figures of "books lodged". This, however, is a question of sufficient importance and complexity to merit treatment in a separate section.

(b) Unrecorded Unemployment in the Cotton Industry.

Short-time in the cotton industry takes different forms in the different sections, and, although custom varies a great deal from one part of the county to another, certain generalisations can safely be made. In spinning, the normal procedure is that a firm which cannot keep the whole of its machinery running full-time will close down completely for several days in the week. Whilst the mill is open the whole of the machinery may be running but, in any case, all the operatives will be at work with their normal complement of machinery. Short-time in spinning, therefore, usually means full days of unemployment succeeded by full days of employment. In this case the Ministry of Labour's unemployment statistics, based on the figures of "books lodged" on a Monday in each month, may be expected to record real unemployment fairly accurately. The only doubt is whether Monday will be typical of the working days of the week. If Monday were a favourite day for mill stoppages then the recorded level would be higher than the real level, or if, from time to time, there was a change in the manner in which the days of stoppage were spread over the different days of the week then the course of recorded unemployment would give a false guide to the real course. But from enquiries which have been made of Employment Exchanges in the cotton area it appears that the discrepancies introduced in this way are not serious statistically. Moreover, since employers seem in most cases to have organised their short-time in order to fit the "continuity rule," the workers have usually been able to draw benefit for the days on which they were unemployed.

In the preparatory processes between spinning and weaving, such as winding, reeling, warping and beaming, whilst a good deal of short-time may be worked in the form adopted in spinning, there is, in addition, a great deal of intermittent and spasmodic unemployment. A worker will often be employed for half a day and then

be sent home or she may work a short day. This type of unemployment is not included in the existing statistics, since the Unemployment Insurance Scheme does not recognise anything less than a full day's unemployment, and persons not at work through short stoppages of this kind do not register at the Employment Exchange. In so far as this intermittent unemployment changes in relative importance to other and recorded forms, then not only the real level but the course of unemployment may be inaccurately pictured. It seems impossible, however, to determine how important this type of unemployment has been.

In weaving, under-employment which does not fall within the official statistics is more widespread, and in this case it is possible to make some assessment of its importance at various dates for limited samples. In weaving it is uncommon, though not unknown, for a mill to be working part of a week. If the mill is running at all, it will usually run 48 hours in the week. Reduction in output takes the form, in the majority of cases, of stopping a certain proportion of the looms in the mill, and usually this closing down is not done by dismissing a number of workers and throwing their looms out of production but by lessening the number of looms which each worker is operating.* In some cases the adoption of the latter method is a matter of choice, in others of necessity. In particular, it is a customary practice in weaving mills which are working at less than full capacity for the weavers who are actually retained to be given warps in rotation, assuming that their empty looms are suited to the type of warps available. This custom, and the intermittent flow and the variety of orders have the effect of periodically reducing the number of looms which each weaver at work is tending. It follows as a broad rule that the weaver may suffer from unemployment in either of two ways: he may be out of work for the whole week or he may be working the whole week but on less than his normal number of looms. In the latter case, he would not be recorded as unemployed in the official unemployment statistics.

One indication of the relative importance of this type of unrecorded unemployment is provided by the statistics of employment and weekly wages paid in the weaving section of the cotton industry which are published monthly in the Ministry of Labour Gazette. The sample of firms covered by this monthly enquiry is rather low, and in other ways the material is open to criticism, but when chain indices of employment and wages paid are calculated, and from these an index of weekly earnings per head is constructed, a very marked fluctuation in weekly earnings is to be noticed when comparing relatively good with relatively bad trading years.

* In March, 1930, a special enquiry was carried through by Employment Exchange Managers in the Cotton Area which showed that it is unusual for weaving mills to work part of the week, although in some cases an individual weaver may be unemployed during part of the week because he is "playing for warps" in respect of two or more of his looms.

TABLE VI.

*Index of the Movement of Weekly Earnings in the Weaving
Section of the Cotton industry.**

(1925=100).						
1924	96.4	1928	...	97.0
1925	100.0	1929	...	98.5
1926	92.8	1930	...	88.8
1927	95.7			

If, to take the extreme cases, 1925 be compared with 1926, when the coal stoppage led to a reduction of output, or with 1930, when the world depression hit the cotton industry very badly, average weekly earnings fell by 7 per cent. and 11 per cent. respectively. A part of this decline may be due to *some* unemployment consisting of full-day stoppages within a week when work was in progress on other days. But if the contention above as to the importance of under-employment in weaving is sound, then the greater part of this drop was the outcome of an increase in 1926 and 1930 of this type of unrecorded unemployment over the amount which existed in 1925.

Fortunately, it has become possible to support this presumption by access to the actual records of weaving mills. Through the kindness of a manufacturer we have records going back to 1927 for two mills, both producing fancy goods and both doing rather better than the average up to 1929, which enable us to indicate broadly the difference between the recorded and the total unemployment. In Table VII three columns are shown for each mill. The first column shows the average number of looms being operated by each weaver for comparison with the average number of looms operated normally on full capacity working. The second shows what would have been the percentage unemployment among weavers normally attached to these mills if, with the looms actually running, weavers had been working their full average complement of looms. This represents the true rate of unemployment among the workers. The third column shows the percentage of the total weavers who actually were not working at all, i.e., were not in the mill.† This represents the unemployment which would result in a person's

* The chain index, was, of course, constructed from month to month, but for convenience in presentation here a simple average of the months for each year was made. Further, there have been changes in piece rates, and these have been allowed for. It is impossible to make allowance for changes in weekly earnings which might well have come about, on the existing price lists, through improvements in the quality of the cotton goods being woven.

† One difficulty attaching to this column and the corresponding column in Table VIII is that it is assumed that a certain number of weavers are attached to a mill and that when they are not working at this mill they will not find work elsewhere. But even if there has been some migration of this sort, it cannot invalidate the comparison which we are making between the second and third columns in each of the Tables VII and VIII, because our failure to allow for migration causes the percentage unemployment in *both* columns to be slightly higher than it would be if migration were taken into account.

registering at the Employment Exchange and coming within the purview of the unemployment statistics.

TABLE VII.
Under-Employment in Two Weaving Mills.

Date.	MILL A.			MILL B.		
	Average No. [*] of Looms being operated by each Weaver. Normal=3.67	Percentage Unemployment among Weavers if Looms running had been worked 3.67 Looms to Weaver.	Actual† Percentage Unemployment among Weavers.	Average No. [*] of Looms being operated by each Weaver. Normal=3.67	Percentage Unemployment among Weavers if Looms running had been worked 3.67 Looms to Weaver.	Actual† Percentage Unemployment among Weavers.
<i>1928.</i>						
Jan. 28 ...	3.48	11	7	3.76	1	3
Mar. 31 ...	3.65	5	4	3.74	0	2
May 26 ...	3.61	5	3	3.78	0	3
July 28 ...	3.60	8	7	3.22	18	7
Sept. 29 ...	2.84	26	5	3.53	5	1
Nov. 24 ...	3.33	13	4	3.46	8	2
<i>1929.</i>						
Jan. 26 ...	3.55	8	5	3.71	0	1
Mar. 30 ...	3.93	0	7	3.78	0	3
May 25 ...	3.54	9	6	3.47	6	1
July 20 ...	2.86	26	6	2.50	39	11
Sept. 28 ...	2.60	39	13	2.89	24	4
Nov. 30 ...	2.47	45	19	2.77	26	2
<i>1930.</i>						
Jan. 25 ...	2.03	51	12	3.05	21	5
Mar. 29 ...	2.48	43	16	2.31	52	24
May 31 ...	2.19	60	34	2.38	48	20
July 19 ...	2.73	73	63	2.77	38	18
Sept. 27 ...	3.17	55	48	2.79	41	22
Nov. 29 ...	2.33	68	50	3.53	11	8
<i>1931.</i>						
Jan. 17 ...	2.72	40	19	2.43	39	8
Mar. 28 ...	2.88	30	10	3.48	5	0
April 24 ...	3.00	22	4	3.43	7	0
May 29 ...	2.69	43	23	2.89	21	0
June 30 ...	2.98	42	28	3.10	18	3

* By using an average figure of looms per weaver some error may be introduced since there are different kinds of looms, different numbers of these are worked per weaver, and the calculation above is based upon the assumption that all the looms are of the same type and that each worker is attached to an equal number of these.

† In determining the number of weavers actually not in the mill at certain dates use had to be made of the number of National Health Insurance stamps purchased by the employed. The result was to show a larger percentage unemployment than was actually the case. This, however, merely strengthens the deductions drawn from the table.

Two conclusions are apparent from this sample. Firstly, real unemployment, measured by the extent to which the worker's capacity for effort is left untouched or in relation to the wages which he can earn on piece work, can rise greatly without this necessarily reacting upon the numbers registering at the Exchanges. And, secondly, the relation between recorded and unrecorded unemployment fluctuates widely from time to time, depending upon such factors, in the individual mill, as the sorts of cloth being produced, the size and frequency of orders for particular sorts of cloth, and the extent to which more than one type of loom is run by the same weaver.

A second sample covers a larger number of mills, but only extends over seven months* in the very abnormal conditions of 1931. This sample covers the mills working in the Blackburn area, and the information obtained from them makes it possible to construct a table similar to that given above. The general results are the same.

TABLE VIII.

Date.	Normal Average No. of Looms per Weaver on Full Running.†	Actual Average No. of Looms Running per Weaver.	Percentage Unemployment among Weavers if Looms Running had all been Operated by Weavers with full complement of looms.	Actual Percentage Unemployment.
<i>1931.</i>				
May 30 ...	3·60	3·30	22·9	15·8
June 27 ...	3·64	3·29	22·3	14·1
Aug. 1 ...	3·56	2·99	32·3	19·3
Sept. 28 ...	3·63	3·17	30·1	18·5
Oct. 31 ...	3·63	3·19	28·5	18·6
Nov. 28 ...	3·67	3·44	18·9	13·4

† It should be noted that there is always a certain number of weavers in a mill (chiefly young weavers) who operate only two or three looms, even when the mill is working at full capacity, and that the proportion which they bear to the total weavers employed may vary from period to period, and from mill to mill in the same period. This accounts mainly for the variation in the first column in the normal average number of looms per weaver recorded at different dates. See also note (*) on p. 107.

This statistical evidence is scrappy and in detail perhaps not absolutely accurate. But there can be little doubt that it reveals conditions of which the working population in the great weaving towns of Lancashire is only too keenly aware. Certain practical corollaries seem to follow:—

* The information was obtained for the last Saturday of each month. The number of firms covered comprised about 25,000 looms and 7,000 weavers.

(1) A great deal has been made in recent months of the "anomalies" which exist in the working of the Unemployment Insurance Scheme. Here, however, is a case which runs against the usual tide of discussion. A weaver working two or three looms instead of four is regarded as fully employed; he pays a full contribution to the Unemployment Insurance Fund. Yet his wage may only be one-half of the normal earnings for full capacity running. And in bad times a large proportion of the workers in the weaving section may be affected in this way. Repercussions upon family income are serious, and there can be little doubt that some married women, whose husbands' earnings have been depleted by this form of under-employment, have been compelled to re-enter the labour force available for employment in cotton weaving and have consequently registered at the Employment Exchanges.

(2) The poll tax upon employment imposed in the form of the employers' contribution to the Unemployment Insurance Fund naturally becomes proportionately heavier when under-employment is common.

(3) There can be little doubt that this under-employment has been one of the influences making for the immobility of the labour in the cotton industry. By spreading work over a larger number of employees it has tended to keep a larger volume of labour attached to each mill than could ever be fully employed again.

(4) For our immediate purpose, however, the important conclusion to be drawn from these figures is that the estimate of surplus given above for 1929 may be much too low. To what extent it falls short of the real surplus cannot be determined even approximately; the available information is incomplete. But it appears that an addition of 10,000 to 15,000 to the previous figure would not over-emphasise the importance of this item.

V.—The Characteristics of the Labour Surplus.

Although the gravity of the situation arising from the presence of a labour surplus depends largely upon the size of that surplus, it is also related to its nature, for it is the sort of labour which is not needed which determines whether effective steps can be taken to drain away the surplus, and whether the chronic unemployment is seriously depreciating national assets by undermining the morale and diminishing the industrial skill of the population. It is obviously a matter of moment whether unemployment occurs amongst males or females, whether it is concentrated in the lower or higher age groups, whether it falls predominantly upon married

or single persons, whether the surplus consists of skilled or unskilled workers and whether it exists in areas where other industries are common or is concentrated in isolated areas depending largely upon one staple trade.

In outlining the features of the labour surplus in the cotton industry it will be necessary in many cases to consider not the industry in the Survey Region but the industry in the North-Western Division or even in Great Britain and Northern Ireland. There is no great danger, however, that false conclusions will be drawn in this way since the cotton industry is highly concentrated in the Survey Region.

One initial difficulty must be touched upon. It is now a platitude that the body of unemployed workers is not a standing army, even when the volume of unemployment is constant; its personnel is constantly changing. It is not possible to determine the "rate of turnover" among the unemployed in the cotton industry or what proportion of the workers has remained constantly in employment. But there are indications that the "rate of turnover" is high, as we might expect from the prevalence of short-time working. The percentage of "temporary stoppages" in cotton is higher than in industry generally and in many staple industries.

TABLE IX.

Percentage of Persons Temporarily Stopped to Total Persons Unemployed, among Insured Persons in the Cotton and Other Industries.

Great Britain and Northern Ireland.

Year. (July)	Cotton.	Coal Mining.	Chemicals.	General Engineering.	Ship- building.	Wool and Worsted.	All Industries.
1926 ...	85·8	—	34·5	39·5	3·7	80·4	38·5
1927 ...	70·5	48·7	11·9	23·8	2·5	66·9	28·3
1928 ...	67·3	44·8	14·0	29·6	5·3	74·8	30·4
1929 ...	55·8	37·9	11·9	29·8	3·4	70·5	25·2
1930 ...	61·7	49·7	15·1	36·4	6·6	59·7	32·1
1931 ...	38·3	48·5	12·7	32·5	5·2	60·3	26·1

A recent special enquiry in the North-Western Division leads to the same conclusion, for it shows that in four Employment Exchange areas in which cotton is the predominant industry an extremely high proportion of the insured population made claims for benefit at some time or other in the year ending December 20th, 1930.*

* See evidence of Mr. Stanley Warrington before Royal Commission on Unemployment Insurance, Jan. 16th, 1931, page 228.

TABLE X.

Percentage of Insured Population making claims within the twelve months ending December 20th, 1930.

	<i>Exchange.</i>	<i>Men.</i>	<i>Women.</i>	<i>Total.</i>
Blackburn	70	87	78
Burnley	67	88	77
Darwen	63	92	77
Oldham	74	84	78

The percentage unemployment in these areas over the same period was about 45 per cent., so that there must have been a fairly wide distribution of unemployment if only about 30 per cent. of the men and 10-15 per cent. of the women failed to make claims at some time during the year.

(a) Age Distribution.

No exact and comprehensive statistics exist of the incidence of unemployment among workers under 16 years of age; for those of 16-17 years unemployment at first sight might seem to be much lower than in higher age groups.

TABLE XI.

*Percentage Unemployment of Insured Persons in the Cotton Industry in the Survey Region.**

Year.	Males.		Females.	
	Men.	Boys (16-17 years).	Women.	Girls (16-17 years).
1923	18·0	10·7	21·1	13·5
1924	14·0	7·3	15·1	8·1
1927	9·1	3·1	8·9	3·5
1929	12·7	5·8	15·1	4·8
1930	40·5	23·0	45·9	21·2
1931	41·7	18·4	47·1	17·3

But complete reliance cannot be placed upon these figures, since a relatively high proportion of juveniles out of work does not register at the Exchanges. Persons below 18 years of age must obtain insurable employment in 30 weeks after attaining the age of 16 years before they qualify for benefit. For this reason, in the case of those aged under at least 16 years 30 weeks the only inducement to register their names at the Exchanges or Bureaux is the additional opportunity of obtaining employment, and numbers certainly do not register when unemployed. Nevertheless, it is probably true that the percentage unemployment among juveniles is lower than for the whole body of workers in the industry.

* No allowance has been made for the exclusion of those above 65 years of age in 1929 and 1930.

Recent sample enquiries by the Ministry of Labour on this question cover the whole range of ages and bring out several significant conclusions.

TABLE XII

Numbers and Percentage of Insured Persons Unemployed in Various Age Groups in the Cotton Industry.

Great Britain.

Age Group.	Males.				Females.			
	1927 April.		1931 February.		1927 April.		1931 February.	
	Estimated No.	Percentage.	Estimated No.	Percentage.	Estimated No.	Percentage.	Estimated No.	Percentage.
16-17 ...	227	1·4	2,608	18·9	561	1·7	4,378	15·2
18-20 ...	3,296	6·7	8,726	40·4	5,559	5·1	15,221	31·0
21-24 ...	2,743	6·5	12,051	44·8	5,321	5·3	24,677	38·2
25-29 ...			16,327	34·3			26,422	43·6
30-34 ...			20,082	42·1				
35-39 ...			16,014	47·9			16,790	47·7
40-44 ...	2,044	5·6	13,891	45·1	1,641	4·4	12,106	41·6
45-49 ...							11,292	55·9
50-54 ...							8,303	43·7
55-64 ...	2,044	10·7	12,287	55·1	818	4·7	6,450	50·0
Total ...	12,074	6·0	81,904	41·7	16,592	4·6	145,721	42·5

The numbers unemployed in the lowest age groups are extremely small in relation to total unemployment, but again the statistics may be misleading for the reasons already given. The most significant point which arises, however, is the extremely high numbers unemployed among young people between 18 and 24 years of age. The 18-24 group accounted for over a quarter of the total unemployed males and females in 1927 and 1931. In both years there were many more unemployed, both males and females, in the seven-year age group, 18-24 years, than in any of the other ten-year age groups, with the solitary exception of one group in the case of females in 1931. Unemployment in the cotton industry is, therefore, to a large degree, unemployment among young adults.

It would have been extremely valuable to have continued this analysis further and determined, for example, whether this mass of unemployment among young adults was evenly spread over the whole group, or whether the "rate of turnover" was low; for the social and economic effects will depend on whether there is a large group of workers unemployed all the time, or whether most of the people in this class are merely out of work some of the time.

But, unfortunately, it has not been possible to throw light upon this.

Nevertheless, it is not possible to over-emphasise the seriousness of the situation as revealed. It means that the future level of industrial skill among the working population is being lowered by periods of enforced idleness at ages when skill is most rapidly acquired and adaptability in greatest evidence, and it points to a disturbing lack of mobility among those who are least encumbered and should move from one place or industry to another with the greatest freedom. Normally, if labour is to have any mobility it must be found to the greatest extent among these young workers who, whilst they have reached the stage at which they will receive adults' wages, have not usually taken up family responsibility. The difficulty involved in the movement of a whole family is great, for housing problems and the factor of the family income enter into it, and much friction in consequence is set up. But if that section of the working population among which family claims are the least tying cannot help itself and meet unemployment by migration, then migration of labour as a solution of the existing surplus must be ruled out.

It is not easy to assign any reasons to this disturbing concentration of unemployment within the lower age groups, but certain causes can be suggested.

It is important to notice that in this respect the cotton industry is not peculiar, for the same disturbing feature is to be seen in industry as a whole,* and presumably there are certain common factors operating throughout industry which are responsible for it. One of them probably is that all the workers up to 24 years of age now have come into industry since 1921, and in the last ten years the chance of acquiring industrial skill by continuous employment has been lessened by the continuous depression in British industry. A further general factor is that a very high proportion of the insured population in industry as a whole falls into the 18-24 year age group; this in itself, if the rate of unemployment were as high in the 18-24 year age group as in the higher groups, would suffice to produce an undue concentration of unemployment within the lower age group. But from certain points of view the position in the cotton industry is even more serious than in industry as a whole. In the table below, the results of the sample enquiries carried through by the Ministry of Labour have been made use of to show the percentage age distribution of the unemployed in 1927 and 1931. It will be seen that unemployment among women is even more highly concentrated in the 18-24 year age-group for

* See the evidence of Mr. John Hilton before the Royal Commission on Unemployment Insurance, July 3rd, p. 1175.

the whole of insured industry than for cotton, but this is only to be expected since the continued employment of women in the cotton industry after marriage results in a higher proportion of the female workers falling into the higher age-groups. For men, however, both in 1927 and 1931, the percentage of the total unemployed who fell in the 18-24 year age-group was higher, and in 1927 considerably higher, in cotton than in all industries. It seems likely, therefore, that some special causes are operating in the cotton industry to produce this vicious position.

TABLE XIII.

Percentage Age Distribution of Unemployed Persons among Insured Population of the Cotton Industry and of all Industries.

Age Group.	Males.				Females.			
	April, 1927.		Feb., 1931.		April, 1927.		Feb., 1931.	
	Cotton.	All Industries.	Cotton.	All Industries.	Cotton.	All Industries.	Cotton.	All Industries.
16-17... ..	1.9	1.5	3.2	1.8	3.4	6.3	3.0	4.1
18-24... ..	27.3	21.4	25.3	22.3	33.5	47.5	27.4	36.7
25-29... ..	22.7	14.7	19.9	13.5	32.1	15.5	18.1	17.5
30-34... ..		10.8		11.0		8.8	13.8	12.2
35-39... ..	16.9	9.7	19.6	9.5	16.2	6.8	11.5	9.0
40-44... ..		8.9		9.0		4.8	8.3	7.1
45-49... ..	14.3	9.4	16.9	9.0	9.9	3.9	7.7	5.3
50-54... ..		9.1		9.0		3.1	5.7	3.9
55-59... ..	16.9	8.0	15.0	8.3	4.9	1.9	4.4	2.7
60-64... ..		6.6		6.7		1.3	1.5	1.5
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Three possible causes suggest themselves for examination.

(a) It is only to be expected that, if labour continues to enter an already over-crowded industry, as is shown in later sections to be the case in cotton,* then heavy unemployment is bound to create a large surplus of young workers, particularly in an industry in which seniority still plays an important role. This would be a convincing enough explanation were it not for the fact that it should

* See p. 123.

result in equally heavy unemployment among those between 14 and 17 years of age and yet it seems that the unemployment here is not high.

Nevertheless, this "banking-up" of young labour is undoubtedly going on. In the spinning process the assistants to the spinner ("big" piecers and "little" piecers) find that promotion to the rank of spinner does not now come so early, and, becoming dissatisfied, they may throw up their jobs and find themselves unable to regain employment. In weaving, the young weaver is not so readily promoted to four looms and, when workers are being discharged, his lack of experience may result in his being dismissed before older and more experienced operatives.*

(b) If it were the case that the wages of workers over 18 years were higher than those of younger workers then it might be expected, particularly in unskilled occupations, that the employer would be inclined to dismiss employees reaching the age at which the higher wage was payable and, taking advantage of the plentiful supply of labour, engage younger people. This cannot, however, be important in the cotton industry. The great bulk of cotton operatives are on piece rates which do not vary with the age of the worker, and even in the occupations paid by time (e.g., among assistants in the spinning process, such as "big" or "little" piecers, "big" or "little" tenters) the wage does not fluctuate with age.

(c) It was suggested that, in some spinning occupations where Trade Union Unemployment benefit was paid in addition to the State benefit, the financial position of the operative when out of work compared very favourably with that when he was employed, and that, in consequence, the inclination to find or keep work was reduced. In the table below representative cases for August, 1931 are given. It will be seen that in some cases the total weekly income during unemployment approximates closely to the weekly wage, and that the relative position of the unemployed persons over 18 years is much better than that of those under 18 years. If details had been taken for married workers instead of single, these points would have emerged even more strongly. It appears that the tendency for young workers to continue longer in the relatively lowly paid occupations, together with the varying rates of unemployment benefit as between those under and those over 18 years, has tended to accentuate the rates of unemployment among those above 18 years in these particular spinning occupations.

* In this connection an enquiry which was made in 1931 among a small sample of 108 weavers belonging to two mills is of interest. It showed that among 31 weavers who were between 22 and 26 years of age at April, 1931, all except two had worked four looms before reaching the age of 19 years. On the other hand, of 77 weavers between the ages of 14 and 23 years 19 were working on four looms but nine of these had only been promoted to them after reaching the age of 19 years.

TABLE XIV*

Occupation.	Average Wage.	Unemployment Insurance Benefit (single worker).	Union Benefit.	Total Weekly Income of Unemployed.
		s. d.	s. d.	s. d.
<i>Little Piecers (Male)—</i>				
Under 18	20s. to 25s.	7 6	6 0	13 6
Over 18	20s. ,, 25s.	17 0	6 0	23 0
The vast majority of little piecers are between the ages of 14 and 20.				
<i>Big Piecers (Male)—</i>				
Under 18	30s. to 35s.	7 6	6 0	13 6
Over 18	30s. ,, 35s.	17 0	6 0	23 0
The vast majority of big piecers are between the ages of 18 and 30.				
<i>Little Tenters—</i>				
<i>(Back Tenters, female).</i>				
Under 18	15s. to 20s.	6 0	5 0	11 0
Over 18	15s. ,, 20s.	15 0	5 0	20 0
The majority of back tenters (i.e., little tenters) are between the ages of 14 and 19 or 20.				
<i>Big Tenters—</i>				
<i>(Frame Tenters, female).</i>				
Under 18	25s. to 38s.	6 0	7 0	13 0
Over 18	25s. ,, 38s.	15 0	7 0	22 0
Very few frame tenters under 18.				

This factor does not appear to have operated so strongly in the weaving section of the industry where Union Unemployment benefit is not so commonly paid.

* The details refer to August, 1931.

(b) *Occupational Distribution.*

The statistics of the Ministry of Labour regarding unemployment in insured industries are broken up into an 101 industries classification. Unfortunately, the cotton industry is taken as a whole and, since no division is made between spinning and weaving, a gap exists in our current statistical information, which it would be of great value to fill and to which reference is made elsewhere.

A number of Exchanges in the cotton area have, however, for a considerable period prepared special weekly returns of the numbers of unemployed workpeople in the main occupations in the cotton industry.*

* The weekly returns are supplied to the Cotton Trade Statistical Bureau. They include Males and Females on the Wholly Unemployed File, the Temporary Stoppage File and Live "B" Cards of non-claimants. The returns have included juveniles as well as adults since November, 1930. The group of occupations covered is:—

- 314 and L.314—Card and Blowing Room Operatives and Labourers.
- 315 and L.315—Spinning, Piecing and Doubling, etc., and Labourers.
- 316 and L.316—Beaming, Warping, Winding, etc., and Labourers.
- 317 and L.317—Weaving, etc., and Labourers.

Since the grouping of the special returns is on an occupational basis and a few occupations are excluded, the total numbers do not correspond with the numbers recorded as unemployed in the "cotton industry" under the industrial classification. Nevertheless, on 22nd December, 1931, the only date for which it has been possible to make a comparison, the two sets of figures appear to be in close agreement, when allowance is made for persons within the industry but outside Occupations 314-317 and L.314-L.317 and therefore excluded from the special return, and for the fact that the unemployment figures for the "cotton industry," as registered by "books lodged," include persons about whom definite information is lacking but whose books are retained in a special file for a period of two months from the date on which they were last in touch with the Employment Exchange. Such persons are not included in the special return.

Unemployed cotton workers on the registers of the Employment Exchanges in the principal cotton trade centres. 22nd December, 1930.

	<i>Males.</i>	<i>Females.</i>	<i>Total.</i>
Total on Wholly Unemployed and Temporary Stoppage Files and Live "B" Cards of non-claimants* in Occupations 314-317 and L.314-L.317.	69,427	154,705	224,132
Unemployment in "Cotton Industry" as registered by "Books Lodged."	80,281	156,909	237,190

* The "occupation" of a non-claimant is that in which he desires to be registered. The "occupation" of a claimant to benefit is that for which he appears to be best suited.

It seems, therefore, that the occupational statistics given in the special returns will enable a comparison of the extent of unemployment in the main occupational groups in the industry for persons between 16 and 64 years of age to be made without any great error.

An analysis of the occupational statistics since September, 1929, shows that there is a remarkable uniformity in the percentage distribution of the unemployed workers over the different occupations. The proportion which the numbers in each occupational class bear to the total numbers unemployed remains roughly constant, for both males and females, and the relation between the numbers of males and females in each class shows no serious divergences between one date and another. If there is any trend at all, it is in the Weaving and the Beaming, Warping and Winding groups, where, particularly for females, the proportion of Weavers, etc., is rising and that of Beamers, Warpers, Winders, etc., is falling.

Upon the basis of the tables which are given in Appendix 4, Tables VI-VIII, it appears that, through the various phases of the depression since the end of 1929, there have been more than twice as many women as men out of work. Among unemployed males, nearly one-tenth are engaged in card and blowing room operations,

around one-half in spinning, rather more than one-tenth in winding, beaming and warping, and about one-third in weaving. Among females, the corresponding proportions are about one-fifth, rather less than one-fifth, a quarter, and two-fifths. Among card and blowing room workers, less than one-fifth of the unemployed are males, in spinning about one-half, in weaving rather more than one-fifth, and in winding, beaming and warping, less than one-fifth.

It is also possible to estimate roughly what proportion of the persons unemployed is skilled, provided that the distinction between the ordinary occupations and the "labouring" occupations made by the Ministry of Labour be accepted as generally dividing skilled persons from unskilled. In this case, however, juveniles under 18 years are not included in the returns. The tables are given in Appendix 4 and they support the following conclusions. An overwhelming majority of unemployed cotton workers over 18 years of age are skilled workers; the "labouring" classes accounted in 1931 for only about 6 per cent. of the total. The proportions vary from process to process. Among males, the unskilled workers are much more important relatively, particularly in the card and blowing room operations, in spinning and in weaving. Among women, the proportion of unskilled is extremely small in all occupations. If all workers in the industry were included the percentage of unskilled might well be raised considerably. Nevertheless, at least 8 out of every 10 applicants for employment have had specialised industrial training.

(c) Geographical Distribution.

When the cotton industry was developing in the nineteenth century it shot out great industrial arms northwards and eastwards from Manchester and brought into prominence such towns as Blackburn, Burnley, Accrington, Nelson and Colne, remote from the main centres of population and for the most part isolated from industries other than cotton. It was to be expected that the serious shrinkage of the cotton industry would create in these industrial outposts pools of surplus labour, the draining of which would present considerable difficulty. Such, in effect, has been the course of events. So far as the distribution of employment is concerned the different cotton centres show no important relative change between 1923 and 1930, although there has been a decline in the cotton area immediately outside Manchester and an increase in the Bolton area attributable very probably to the relative prosperity of fine spinning until 1929.*

Rather striking results emerge from the table showing the distribution of the unemployed.† In 1923 and again in 1927, over

* See Appendix 4, Table XIII.

† See Appendix 4, Table XIV

a quarter of the unemployed was concentrated in the northern weaving towns grouped around Burnley and Blackburn, and in 1930, this proportion had risen to more than one-third. This can perhaps partially be explained by the fact that it is in the weaving areas, largely employing female labour, that the greatest increases in the number of insured arising out of administrative changes in the Unemployment Insurance have taken place. But, from the point of view of industrial transference, it is a serious matter that there is such a high proportion of the unemployed in towns which, broadly speaking, can offer no alternative forms of employment, and which are far removed from the areas in the county in which industry is expanding. The two large spinning areas, the towns around Oldham and Bolton, account for a further quarter of the unemployment, and the Bolton region shows a significant percentage increase between 1923 and 1930 which, in view of the actual increase in employment mentioned earlier, must be due to the increase in the number of insured persons from 54,000 in 1923 to 61,000 in 1930.

The gravity of the position is made apparent when it is realised how dependent the northern weaving areas are upon the cotton industry. Table XV shows that in the Blackburn area 60 per cent. and in the Burnley area 70 per cent. of the insured population is attached to the cotton industry, the proportion being very much higher among women than among men. Elsewhere in Lancashire, with the exception of the Oldham area, the proportions are much lower.

TABLE XV.

Percentage which Insured Persons in the Cotton Industry bear to Insured Persons in all Industries in each of the Sub-Areas of the Survey Region, 1923 and 1930.

Sub-area.*	1923.			1930.		
	Males.	Females.	Total.	Males.	Females.	Total.
Blackburn, etc. ...	37.6	89.5	61.3	34.9	87.2	59.7
Bacup, etc. ...	35.6	71.6	50.7	33.1	66.9	47.7
Oldham, etc. ...	46.6	86.9	61.7	47.2	82.8	61.7
Bury, etc. ...	28.3	71.5	45.8	27.3	68.6	44.6
Stalybridge, Hyde, etc. ...	24.9	71.4	43.8	23.9	65.4	41.1
Bolton, etc. ...	24.5	77.6	43.9	26.5	74.2	45.6
Atherton, Wigan, etc. ...	3.7	60.4	16.3	5.5	54.4	18.8
Chorley, Preston ...	28.3	80.7	51.6	23.1	71.4	44.3
Trafford Park, etc. ...	3.0	23.0	8.3	2.3	20.1	7.4
Lancaster, etc. ...	1.7	10.7	4.1	1.8	8.6	4.0
Burnley, Nelson, Colne ...	56.6	91.9	72.1	54.3	88.3	69.7
Manchester, etc. ...	3.2	13.4	6.8	3.7	13.1	7.2

* For the exact content of each Sub-area in terms of Employment Exchange Areas, see map facing p. iv.

*(d) The Special Case of Married Women.**

Discussions concerning the presence of large numbers of married women workers in the cotton industry centre around two principal points: how far have married women been returning to, or staying longer in, the cotton industry, and to what degree has unemployment been thrown disproportionately upon married women, or, to put this in another way, are married women being replaced by single women or by men?

These two questions are inextricably bound together since the statistics available for their answer have a basic relation. The number of insured persons unemployed in any industry is obviously related to the total of the insured persons in it. The total of insured persons will in turn depend upon how quickly people come into insurance and how quickly they leave, but the speed of entry and the speed of exit are influenced by such factors as changes in the administration of the Unemployment Insurance Scheme which make the qualifications for the receipt of benefit more or less rigorous: or changes in the personal circumstances of a potential worker—for example, in the case of a married woman, whether her husband can find work or not. If, for example, through some administrative change, large numbers of elderly married women remain in insurance who are no longer really seeking work and would normally have passed out of insurance and industry, then the relative increase in unemployment among married women might be due, not to the tendency for single women or men to displace married women, but to the increase in the numbers of insured persons regarded as attached to the industry. Or if, through heavy unemployment among married men, the normal age at which their wives retire from industrial employment rises, an increase in unemployment among married women might be due to an increase in the numbers seeking work.

There is no adequate information of the marital distribution of unemployment among females. The nearest approach that can be made to it is through two enquiries, made in 1929 and 1931, into the constitution of the live register covering *all* females in those Employment Exchange areas in Lancashire in which the cotton industry provides the great bulk of the employment for women. These show that, at the two dates, the great majority of women registering as applicants for employment were married.

* It is extremely probable that the position outlined in this section will be substantially modified as a result of the Anomalies Act. It seemed worth while, however, to study the causes leading up to the situation in the middle of 1931.

Percentage Marital Distribution of Females on the Live Register at 44 Employment Exchanges in Cotton Areas.

Date.	Numbers.			Percentage.		
	Total Live Register.	Married.	Single.	Total.	Married.	Single.
11th Nov., 1929...	53,438	32,237	21,201	100	60.3	39.7
20th July, 1931 ...	157,790	87,630	70,160	100	55.5	44.5

It will be seen that well over one-half of the persons applying for work were married. Now the 1921 Census showed that only about 28 per cent. of the total occupied females in textiles and 19 per cent. of them in all occupations in Lancashire and parts of Cheshire and Derbyshire were married. An impression is created, therefore, from a superficial examination, that there is a disproportionate incidence of unemployment upon married women.

This impression is heightened by a classification between the different types of unemployment. Among married women on the register at the two dates mentioned above about 70 per cent. were wholly unemployed and 30 per cent. temporarily stopped, whilst the corresponding proportions for single women were 40-50 per cent. and 50-60 per cent.

Distribution between " Wholly Unemployed " and " Temporary Stoppages " of Married and Single Females on Live Register, at 44 Employment Exchanges in Cotton Areas.

Date.	Married.			Single.		
	Wholly Un-employed.	Temporarily Stopped.	Total.	Wholly Un-employed.	Temporarily Stopped.	Total.
11th Nov., 1929	65.4	34.6	100	36.2	63.8	100
20th July, 1931	75.6	24.4	100	52.3	47.7	100

The question still remains, however, how far this heavy incidence of recorded unemployment upon married women is due to some abnormal increase in the numbers insured, arising either through their remaining longer in the industry than formerly, or through their coming back into the insured population after having dropped out for a period. No direct evidence is available on this point, but there are certain indirect suggestions that, in fact, married women have been delaying considerably their exit from

insurance.* The number of persons who drop out of insurance each year can be estimated.

Wastage from Insurance of Women in the Cotton Industry of the North-Western Division, 1923-1931.†

	<i>Women.</i>		<i>Women.</i>
1923-24	6,777	1927-28	4,807
1924-25	4,144	1928-29	3,251
1925-26	— 65	1929-30	—14,794
1926-27	9,820	1930-31	5,933

The table shows that for females over 18 years, among whom the greater proportion of married women is to be found, the numbers dropping out of insurance have shown a marked decline since 1926-27, and in 1929-30 actually showed a substantial "negative" wastage.‡

Consequently, it would seem that the abnormal incidence of unemployment upon married women cannot definitely be written down as a sign that married women are being displaced in the cotton industry. It is more probably due to an exceptional increase in the numbers insured arising out of a decline in the rate of exit from the industry. This conclusion accords with the general opinion of the Employment Exchange managers in the area, for, in a special enquiry that was made among them in March, 1930, a very large majority stated that there was no tendency for unemployment to be concentrated on married women,§ although when they ceased work for special reasons, such as maternity, they found it difficult to regain their jobs.

It seems, therefore, that if the surplus labour in the industry appears to consist disproportionately of married women, this is largely due to conditions which have attached an abnormally large number of workers of this class to the industry.

* The smaller proportion of "temporary stoppages" among married women than among single women as revealed by the enquiries of 1929 and 1931 does, in fact, indirectly lend some support to the view that many married women have been delaying their departure from insurance while others have been returning into insurance who had previously dropped out.

† Women are insured persons aged 18-64 years inclusive. From 1925 onwards the figures are exclusive of cases in which, as the result of systematic search, duplication of applications has been discovered. Before this date, a small number of such duplications will therefore be included.

‡ See p. 79 for an explanation of the expression "negative wastage."

§ This is further supported by the events since September, 1931, for it appears that the improved trade in the cotton industry has led to many married women regaining employment.

VI.—Factors Connected with the Labour Surplus.

(a) *The Inflow and Outflow of Labour.*

The continued depression has naturally led to a fall in the number of entrants into the cotton industry, but whilst this decline has been substantial, very large numbers still enter the industry each year. The table below shows, that, even in 1929-30, 20,000 persons in the cotton industry of the North-Western Division entered insurance for the first time; that the decline in the number of new entrants has been concentrated mainly on adults; and that the numbers of boys and girls (i.e., those between 16 and 18 years) entering insurance in the industry have not fallen to the same extent.

North-Western Division.

New Entrants into Unemployment Insurance in the Cotton Industry, 1923-30.

<i>Year.</i>	<i>Men.</i>	<i>Boys.</i>	<i>Women.</i>	<i>Girls.</i>	<i>Total.</i>
1923-24	941	9,361	6,897	16,247	33,446
1924-25	1,110	8,880	7,151	16,085	33,226
1925-26	885	8,079	3,635	14,567	27,166
1926-27	1,588	9,728	2,640	12,537	26,493
1927-28	321	7,626	2,027	14,038	24,012
1928-29	202	7,443	1,121	13,501	22,267
1929-30	222	6,709	756	12,739	20,426
1930-31	305	5,382	283	10,924	16,894

But although entry has declined, the cotton industry is still absorbing a very large proportion of the supply of new labour which becomes available for occupation in the Division. Of the total new entrants into insurance in all industries in the Division in 1929-30, cotton still accounted for 17 per cent., the proportion having fallen from 21 per cent. in 1923-24. The proportion of the boy entrants absorbed by the cotton industry was 17 per cent. in 1923-24 and 13 per cent. in 1929-30; in the case of girl entrants, as many as 36 per cent. in 1923-24 and 28 per cent. in 1929-30. In certain areas, apparently, the cotton industry is still absorbing nearly one-half of the school-leavers. In the table below, information has been drawn together which was collected from a number of Local Education Authorities regarding the industries which children first entered on leaving school. No great reliance can be placed upon the details, but there is strong support for the view that, although the proportion of children entering the cotton industry is falling in areas where the surplus of cotton workers is great, they still continue to enter in great numbers.

Numbers of Children Entering the Cotton Industry as Percentage of All School-leavers.

Year.	Oldham.			Bolton.			Salford.			Chadderton.			Burnley.			Stockport.			Blackburn.
	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Boys.	Girls.	Total.	Total.
1920-21	58.2	80.8	70.4	—	—	—	5.7	10.7	8.3	—	—	—	52.7	73.5	63.1	35.2	43.4	39.2	—
1921-22	46.1	71.1	58.9	—	—	—	5.9	10.3	8.1	—	—	—	—	—	—	24.1	33.6	28.7	75.3
1922-23	32.5	62.9	48.2	—	—	—	4.8	9.9	7.3	—	—	—	—	—	—	—	—	—	49.1
1923-24	34.8	66.5	50.9	56.5	74.3	65.3	4.4	12.0	8.1	—	—	—	—	—	—	—	—	—	51.4
1924-25	39.7	66.7	53.1	44.0	69.0	56.5	3.3	12.1	7.6	—	—	—	—	—	—	—	—	—	55.3
1925-26	38.9	62.1	50.4	54.4	75.7	65.4	3.9	11.7	7.8	63.5	79.2	72.0	—	—	—	22.0	37.7	29.6	—
1926-27	34.2	59.1	46.9	57.1	78.3	67.9	5.1	11.2	8.1	51.4	75.9	64.4	—	—	—	22.5	37.7	30.2	—
1927-28	32.4	56.7	44.8	42.8	70.4	57.4	3.6	9.7	6.6	59.1	71.4	65.6	—	—	—	24.5	35.9	30.2	58.4
1928-29	30.5	55.9	42.9	—	—	—	3.3	9.5	6.3	46.6	69.8	58.4	—	—	—	21.4	32.7	27.0	47.3
1929-30	—	—	—	—	—	—	3.1	8.1	5.5	43.3	57.3	49.9	—	—	—	17.9	29.3	23.5	50.4
1930-31	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	35.4

The decline in the numbers entering the industry has not led to any marked reduction in the total insured persons since there has been an equal and counteracting reduction in the numbers leaving the industry. The "wastage" from insurance is shown below. Between 1927 and 1930, there was a continuous drop in the numbers going out of insurance.

North-Western Division.

"Wastage" from Unemployment Insurance in the Cotton Industry, 1923-1931.

			<i>Males.</i>	<i>Females.</i>	<i>Total.</i>
1923-24	...	...	18,382	26,114	44,496
1924-25	...	...	3,340	17,806	21,146
1925-26	...	...	6,524	16,642	23,166
1926-27	...	...	18,276	23,077	41,353
1927-28	...	...	12,587	20,275	32,862
1928-29	...	...	5,285	16,672	21,957
1929-30	...	...	10,101	-105	9,996
1930-31	...	...	12,287	19,327	31,614

It is patent that an extremely unhealthy position has developed in which labour is continuing to flow into an already overcrowded industry. The forces which maintain this inward flow can well be imagined. The percentage unemployment among juveniles has probably been lower than among adults since 1923. Moreover, in some of the cotton areas which show a serious surplus of adult workers, particularly those in the north-eastern parts of the Region, there are no other important industries which can afford alternative employment on a large scale to juveniles. It appears, indeed, that in these areas, in recent years, the lack of alternative occupations has virtually compelled many to enter the cotton industry who were reluctant to do so. An interesting instance of such a locality is the Borough of Nelson. A recent enquiry conducted by the Juvenile Employment Bureau of Nelson has revealed that up to September, 1931, 20 per cent. of the boys and 45 per cent. of the girls who left school during the year ending June, 1931, had been absorbed in cotton trade occupations.

Number and Percentage of School-leavers in Nelson, 1930-31, obtaining employment up to September, 1931.

<i>Occupation.</i>	<i>Number of Boys.</i>	<i>Percentage.</i>	<i>Number of Girls.</i>	<i>Percentage.</i>
<i>Occupations in Cotton Industry.</i>	31	20	74	45
<i>Shop Assistants ...</i>	17	11	18	11
<i>Other occupations ...</i>	43	27	28	17
<i>Unemployed ...</i>	65	42	44	27
<i>Total ...</i>	156	100	164	100

Of the trades other than cotton, only the distributive trades found work for more than 3 per cent. of the school-leavers, and a very high proportion (42 per cent. of the boys and 27 per cent. of the girls) had not found work at all up to September. Moreover, it appears that many of each sex were obliged to take employment in the cotton industry who desired to enter occupations in other trades. Whilst, however, the action of the individual can well be understood, there seem grounds for controlling a system which is perpetuating unemployment and gathering around a shrinking industry further supplies of semi-trained and semi-employed juvenile workers.

(b) *The Mobility of Labour.*

The immobility of the labour force associated with the Lancashire cotton industry is so obvious even to the casual observer that it has not been considered necessary to make any up-to-date statistical study of it. Earlier investigations* have shown that there has been very little movement of labour between the exceptionally depressed and the relatively prosperous cotton areas or between the cotton and other industries. And the slowing up of "wastage" from insurance in the cotton industry of the North-Western Division in the past two or three years, together with the slight migration from the county between 1921 and 1931, made it unnecessary to support further by statistics a fact that is perfectly clear.

It would indeed be a matter of great surprise if numbers of persons large enough to affect substantially the surplus of labour had withdrawn from the cotton industry since 1923, for there exists here a combination of factors all converging upon the creation of labour immobility, factors which those not closely acquainted with the industry might find almost incredible. The industry is one in which the small firm predominates, particularly in weaving, and with this has gone a personal relationship between employer and worker in which the former acknowledges a responsibility to find, and the latter assumes the right to have the offer of, work. Cases have been found during these enquiries in which, in isolated villages, a manufacturer has retained the full complement of workers even after introducing labour-saving machinery which would have enabled him to dispense with a part of them. Production has been carried on at a loss merely to provide employment. Mills have been re-started partly with capital provided by the workers themselves. In the aggregate, perhaps, such cases are not important in relation to the whole industry, but they have added further friction operating against the ruthless revelation and elimination of surplus labour, and, indeed, surplus machinery.

* See "Mobility of Labour in the Cotton Industry," Jewkes and Campion, *Economic Journal*, March, 1928, and "Report on an Investigation into the Employment and Insurance History of a Sample of Insured Persons, 1927," Ministry of Labour.

In the main, this disturbing immobility is attributable to three causes; firstly, the nature of the labour and its geographical distribution; secondly, the prevalence of the family income; and thirdly, the cloaking of the true position in the labour market by the working of short-time and the under-employment of workers.

The great bulk of workers in the cotton industry are specialised; they cannot move out quickly to other skilled work without preparatory training. Round about five-eighths of the surplus of labour in 1929 appear to have been female workers, of whom large numbers were married. The general difficulties incidental to the movement of women workers are well recognised. In particular it is found that the relative independence of an industrial life makes the women workers averse from entering domestic service and similar occupations. The majority of workers are living in towns in which alternative occupations are not numerous and which are often fairly long distances from the big centres of population where a great variety of industries is the normal thing. Especially is this true of women workers, for the cotton industry has attracted exceptionally large numbers of women into industrial employment in towns which provide scarcely any alternative occupations for them in other industries or services apart from retail distribution. Further, the very thrift which characterised the industrial population before the War may now be an added hindrance. Houses which have been bought cannot be sold; workers are loath to leave the neighbourhood in which their dwindling capital remains locked up in the local cotton concerns.

The family income has had the effect of lessening the hardships of unemployment and, in particular, of weakening the drive for younger workers to seek new fields.

Finally, and this is a factor to which sufficient importance has not been attributed, the forces making for migration have been weakened because the true nature and volume of the permanent surplus of labour have been masked by short-time working and under-employment. Short-time working is not peculiar to the cotton industry, but it is much more frequently met with here than elsewhere, and it reveals itself in much more varied forms.*

Until 1929, it was broadly true to say that the decline in output had resulted, not so much in the elimination of firms from the cotton industry, but in the reduction of output of each firm. Before the War, cotton workers particularly in weaving were accustomed to regard themselves as attached to one firm and even to one particular set of machinery in that firm, and this practice has passed over into a period when depression has not been a temporary set-back but a permanent condition demanding a radical reduction in numbers. Short-time working and under-employment, therefore, have meant that the hundreds of firms in the industry have continued since

* See p. 104 et seq., where an account is given of the forms which short-time and under-employment take in the cotton industry.

1921 to maintain a hold upon a body of workers which is too large ever to be fully employed, the surplus has never been made clearly evident, and most firms have been agents in the creation of semi-casual employment.

The Industrial Transference Scheme, with its scheduling of "depressed areas" for special treatment, was not applied to Lancashire cotton districts until June, 1930, when the general depression made transference extremely difficult. The results shown for men from depressed cotton areas admitted to Training Centres since that date, however, have not been encouraging. Of about 1,000 men trainees, 480 were placed by the Exchanges and another 78 found work for themselves, but 189, after completing the course, returned home, and 247 were either discharged from the centres or left them before the completion of the training period.

These facts concerning the immobility of cotton workers are now well recognised. The important question is what remedies can now be adopted to deal with the abnormal position. Obviously, if any scheme of industrial transference of cotton labour either to new industries or to new areas be contemplated, these difficulties which arise from the characteristics of the workers, their geographical distribution or the family income must be taken as they are found. They cannot be modified quickly or substantially. But the influence of short-time running and under-employment can and should be eliminated. This can only be done by a process of amalgamation of concerns or curtailment of capacity in such a way that those who are employed shall be continuously employed, and those who cannot be employed shall know it definitely. It may be argued that, at the moment, no alternative employment can be found for the surplus. The answer is that there is even less chance of the surplus becoming re-absorbed in industry if its existence is never made obvious. Or it might be advanced that in the case of the largest amalgamation in spinning, the Lancashire Cotton Corporation, the same intermittent running and short-time are to be found as in the industry generally. Nevertheless, it still remains true that curtailment of capacity, through amalgamation or otherwise, is the only line which opens up even the possibility of eliminating short-time working and under-employment, and that, by helping to outline clearly the labour problems to be faced, the schemes of re-organisation at present being discussed both in spinning and in weaving have much to be said for them on this score.

(c) Technical Changes and the Relation between Employment and Output.

Statistics of physical output per head in the cotton industry are so unreliable as to be almost meaningless. If the normal procedure is followed and changes in output per head are determined

by comparing the movements of an index of production with those of an index of employment, a very substantial fall in output per head since 1923 is shown.

*Output, Employment, and Output per Head in the Cotton Industry of Great Britain, 1924-1930.**

<i>Year.</i>	<i>Output.</i>	<i>Employment.</i>	<i>Output per Head.</i>
1924	100	100	100
1925	113	109.6	102.7
1926	96	98.5	97.5
1927	106	107.2	98.9
1928	96	102.1	94.0
1929	94	101.0	93.1
1930	68	72.7	93.5

An index of this sort, however, is subject to many possible errors. The index of production is one for yarn produced; any unequal degree of activity between spinning and weaving would therefore throw the index out of the true for the industry as a whole. On the other hand, the employment index may not faithfully record changes in the number of hours worked or changes in the intensity of work, for, as has been shown above, the recorded figures of unemployment in the weaving section of the industry give no exact indication of the amount of under-employment which may exist.

The most serious weakness of this type of index is that it cannot reflect changes in the quality of goods produced or in the sort of work required of the operative, and in the cotton industry these changes have been extremely important. In many cases since 1921, the intense competition has led employers to supply the operative with inferior material and this in itself would be sufficient to cut down output. But more important than this has been the general change in the type of goods produced. Up to 1929 the decline in exports was concentrated in those sections which were engaged upon the coarser types of product. As the industry moves from coarser to finer goods, the hourly physical output of each worker naturally declines, the work to be performed in producing a lb. of yarn is greater, the operations to be carried through in the weaving of a yard of cloth are prolonged, and, of course, the value of each physical unit of output is augmented. In order to portray how important changes in the quality of output may be in relation to output per head measured in lbs. or yards, we show below, estimates of the output per spindle per hour of Mule Spindles running under normal conditions for different counts of yarn.

* The output index is that prepared by the Cotton Trade Statistical Bureau and here reproduced by their permission. It takes the form of an estimate of yarn produced based on cotton consumed. The Employment Index is constructed by deducting from the number of insured persons a monthly average of the insured persons recorded as unemployed. An allowance has been made for the exclusion of persons over 65 years of age after January 2nd, 1928.

Counts of Yarn.	Pounds per Spindle per Hour.	Counts of Yarn.	Pounds per Spindle per Hour.
10's ... ..	.685	70's	.048
30's ... ..	.195	90's	.035
50's ... ..	.102	100's	.029

Similarly, if a group of cloths of different types, qualities and degrees of fineness be taken, the time required under normal conditions to weave one yard fluctuates very widely.

Type of Cloth.	Time required to weave one yard.	Type of Cloth.	Time required to weave one yard.
	Mins.		Mins.
Plain Printer	11.6	Warp Sateen	17.3
Plain Bleacher	15.6	Poplin	16.1
Plain Voile	13.3	Brocade	15.2
Plain Viscose Dress Cloth (Crepe)	15.4	Velveteen	55.5
Sateen	29.4	Towel (Terry)	15.2

Under the circumstances, with statistics which may provide a hopelessly inaccurate picture of the real position as to the relation between employment and output, it is preferable to rely upon common observation. Enquiries have been made in a large number of representative spinning and weaving mills in the area, and the findings may be summarised in the following manner. Output per head has not fallen to the degree which the statistics would suggest, for there has been a marked change in the quality of the output. Some inefficiency has crept in during the depression since firms have been so anxious to obtain orders that they have often been willing to accept them, even when it involved quite costly adaptations of the machinery. But, generally speaking, the urgency to cut costs and eliminate waste and the retention of the best workers when large dismissals have been taking place will have been sufficient to maintain average output per head substantially. On the other hand, it is apparent that, up to the moment, no widespread introduction of new technical methods has taken place sufficient to increase output per head, over the industry as a whole, or to displace large bodies of labour through rationalisation. It would, however, be a mistake to assume that the industry is not interested in technical changes. On the contrary, numerous experiments have been made, devised to test out the possibilities of new systems of production, which are likely to have important reactions in the future upon the demand for labour. These are considered in the chapter which follows.

CHAPTER 5.

**TECHNICAL CHANGES AND THE DEMAND FOR LABOUR
IN THE COTTON INDUSTRY.**

In the preceding chapter it has been pointed out that the technical changes which have been introduced since the end of the War in the Lancashire cotton industry have not been sufficient to influence output per head appreciably, but that widespread experiments are being carried out with new methods which in the future may have important reactions upon the demand for labour. In this chapter indications are given of the probable order of magnitude of the labour displacement which may follow upon the adoption of these new methods.

The conclusions arrived at must necessarily be provisional and approximate. The total amount of labour displaced by the reorganisation of, or the use of new technical devices in, any manufacturing process naturally depends upon the speed and extent of the change, and it is impossible to make any forecast of these. Moreover, where new methods are adopted, lower costs and prices might well be expected, and the consequent expansion of the market would lessen the actual displacement of labour. No one can estimate, however, the exact reduction in costs which would follow the introduction of the new methods, or the degree to which demand would expand as a result of a given fall in price. Further, the rapid turnover of labour often greatly reduces the displacement arising out of technical changes. Industries are constantly losing labour through death, retirement, transfers, etc., and this in itself, provided that new entrants be reduced in number, may make it unnecessary to dismiss any of those attached to the industries.

Minor changes in the methods of production are constantly being made in all branches of the cotton industry, but the following probably have the most important influence upon the demand for labour :—

- (1) The introduction of high draft spinning.
- (2) The use of high speed winding and warping machinery.
- (3) The replacement of ordinary looms by automatic looms.
- (4) The reorganisation of the weaving process, by which each weaver tends a larger number of looms.

Whilst it is true that many examples of each of these forms of reorganisation can be found in the cotton industry, particular attention has been devoted to the "more looms" system, for there changes in the demand for labour are likely to appear earlier and on a more extensive scale than in the other cases, where many obstacles prevent the rapid replacement of the old methods by the new.

I.—High Draft Spinning.

In the production of cotton yarn, after the raw cotton has been cleaned, the cotton fibres are arranged into approximately parallel order. The fibres are then drawn together into a thick rope known as a "sliver." Before the final spinning process is carried out, the sliver must be regularised and elongated. This elongation, known as drafting, is commenced in the card room and continued in the spinning room.

The system of drafting which has been universally practised until quite recent years involves elongation of the sliver by a series of stages requiring the use of machines known as the slubber, the intermediate, and the rover, frames. Following upon these stages comes the final spinning process.

This established system of "low draft" spinning is costly. The triplicating of labour charges at the card room stages accounts for a substantial proportion of the cost of converting raw cotton into yarn, and, in addition, there are the charges for interest, depreciation, and floor space for the machines through which the material has to pass.

It is claimed for "high draft" spinning that it will considerably cheapen the cost of converting raw cotton into yarn, the principal economies being found in the elimination of one or more of the processes in the card room and in the use of inferior cotton for the production of the same quality yarn.

Whatever substance there may be in these claims, high draft spinning is not being rapidly adopted in this country and is much less common here than in many other countries.* There are, indeed, many factors which must militate against the rapid turnover from the old spinning system to the new in England.

1. In the English cotton industry about three-quarters of the spindles are mules, and, whilst ring spinning is becoming more common, it is not nearly so important relatively as in the cotton industries in many other countries. Certain advantages are claimed for the mule. The chief is that it produces better quality yarn, and this is of great importance in the manufacture of the speciality goods which constitute a high proportion of the English trade. Whatever may be the correct view of the relative efficiency of mules and rings there can be little doubt that the majority of spinners in England still consider that mule spinning is superior for their purposes. Now, it appears that high draft spinning can be more cheaply and more advantageously adapted to ring spinning than to mule spinning. It is true that there are some cases in England of high drafting being adapted to mule spindles but this does not seem to be nearly so common as its use with ring spindles.

2. If the prevalence of mule spinning in England is to impede high drafting in this way, a second factor, likely to prevent the

* See Appendix 5, Table I.

rapid adoption of ring spinning, must be borne in mind. A substantial change over from mule spinning to ring spinning would demand considerable changes in the distribution of the intermediate processes between spinning and weaving—winding, warping and beaming. In the case of "warp" yarn produced on rings, the yarn must be wound from wood or paper tubes on to "beams" at, or near, the spinning plant for transport to the weaver in order to reduce freight charges, whereas mule warp yarn spun on the bare spindle can be transported easily and economically in the form of "cops". For warp yarn, therefore, because of the predominance of mule spinning, it does not matter where the intermediate processes are carried out, and in practice, in Lancashire they appear to be carried on about equally by spinning and weaving firms. But if warp yarn produced on rings were more commonly used, it would become essential to carry out the winding and beaming at the spinning plant and the weaving firms would lose much of the preparatory work they now perform. An important technical re-arrangement of the industry would obviously be necessary.

With ring weft yarn there would be the same technical difficulties in an even more intense form. The winding of the yarn into beam, ball or hank form would again have to be carried through in connection with spinning and this would involve additional capital outlay at the spinning plant and the installation of weft re-winding plant at the weaving shed.

3. Whatever may be the advantages of high draft spinning, there can be no doubt that the shortage of capital since 1921, occasioned by the disinclination of investors to take risks in an unprofitable industry, has made it impossible for the great majority of concerns to purchase new machinery.

These, then, are the important factors which have made the extent of the introduction of high draft spinning in Lancashire insignificant in the past ten years. Whether the Lancashire spinner is following the right policy in retaining mule spinning is not the question at issue here. But there is reason to think that these same factors will continue to operate in the future to make the introduction of high drafting slow.

If, however, high drafting were introduced on a substantial scale it would have important reactions upon the character and volume of labour required for a given output, and it has been found possible to make direct investigations of certain mills, where the change-over has been made, which throw light upon these reactions.

It is important to distinguish between three main types of conversion from low draft to high draft spinning since the effects upon output per head and demand for labour will depend upon what class of conversion is being considered. These distinctions arise from the fact that the two types of spinning—ring and mule spinning—are based upon different mechanical processes and require different kinds of labour.

(1) A mill with mule spindles may adopt high drafting with its original mules. As is pointed out earlier, this method is not yet generally favoured.

(2) A mill with mule spindles may entirely scrap its mules and instal high draft ring spindles.

(3) A mill with low draft ring spindles may adopt high drafting.

An increase in physical output per head is a marked feature of the conversion to high draft spinning, particularly where the change is made from mules to high draft rings. But, along with the change in numbers employed for a given output, goes also an important change in the character of the labour required, depending largely upon the nature of the conversion effected. In ring spinning there is a more equal distribution between males and females. For example, one of the mills investigated, with mule plant, had 187 male operatives and 123 female operatives, whilst another mill with ring plant, producing roughly the same quantity and counts of yarn, had only 41 males but 241 females. Therefore, in the case of a mule mill which changes over by scrapping its mule plant and adopting high draft ring spinning, a demand is created for female labour in the spinning room and male mule spinners become redundant. In other types of conversion, the only important changes would be in the card room, where females would be displaced. Where yarn has been spun on low draft rings there is no important spinning room labour change on conversion to high draft.

These points are brought out clearly by the details of mills which have been investigated. Mill A is one which changed over from mule spinning to high draft ring spinning.* The labour required under the old and the new spinning systems is shown below. The serious reduction in the demand for labour is patent.

MILL A.

Summary of Labour Requirements in Card and Spinning Rooms for Given Output.

				<i>Old System.</i>	<i>New System.</i>
Men	...	...	...	76	34
Women	...	...	...	90	169
Youths	...	...	...	50	—
Boys	...	...	...	54	—
Girls	...	...	...	30	37
Total	...	...	...	300	240

There is, then, a substantial reduction of male labour and a smaller increase in the demand for females. But a more detailed analysis

* Details given in Appendix 5, Table II.

of these figures shows that there is an actual reduction of female labour in the card room, the details being :—

	<i>Old System.</i>		<i>New System.</i>	
	<i>Males.</i>	<i>Females.</i>	<i>Males.</i>	<i>Females.</i>
Card Room	20	115	20	83
Spinning Room	150	—	4	122
Subsidiary	10	5	10	1

In the case of Mill B, which had converted from low draft ring to high draft ring spinning, it was not possible to obtain full details, and the case is complicated by the fact that some of the labour which would normally have been displaced was re-absorbed by plant extension. From the information available, however, it was made clear that normally there would have been substantial displacement of labour, but that it was less, proportionately, than that shown above.

It was extremely difficult to obtain other examples giving the same amount of detail, but in other sets of costings it was found that the reduction of workpeople for a given output was 42 per cent. in one case, 50 per cent. in another,* and 56 per cent. in a third.†

To summarise: the changes in the demand for labour arising from the introduction of high draft spinning depend upon the type of conversion adopted. If, as has been most common, mule spindles are entirely replaced by high draft ring plant then females will almost wholly replace males in spinning. If, however, what is much less common, high drafting is applied to mule spinning, then the male mule spinners will be retained but females displaced in the card room. If high drafting is applied to an existing ring installation, again the only change will be in the card room where females will be displaced.‡

II.—High Speed Winding and Warping.

After spinning and before being arranged at the back of the loom for weaving, the warp yarn must normally be wound on to a large beam and then sized. The winding plant may be in the spinning mill or in the weaving shed, although a ring spinning mill almost invariably prepares its yarn in beam form before delivering it to

* See Appendix 5, Table III.

† See Appendix 5, Table IV.

‡ The fact that females are displaced in the card room in any case, whatever the type of conversion effected, makes it possible to give a very rough estimate of the total displacement of this kind that would take place if high drafting were universally adopted and output remained the same. Thus, if we take the coarse spinning area (Oldham, Ashton, Rochdale, Bury, Manchester and Wigan) and make use of the 1921 Census of Population material and our own samples of displacement in individual concerns, the number of females displaced in the card room would be between 12,000 and 15,000.

the weaver. The complete process can conveniently be termed "preparation" and is composed of two complementary operations:—

(a) Winding the yarn from the mule cop or ring bobbin on to a larger package.

(b) Warping or beaming, by which the yarn from a number of packages prepared by the above process is transferred on to a beam.

Before the last decade, the two processes of "winding" and "beaming" had been regarded as relatively unimportant, the preparation stage being seen as a necessary and expensive operation coming between spinning and weaving. Technical research, however, has brought to light various harmful effects of the older methods of preparation upon the quality of the yarn, principally a loss of yarn elasticity which has serious consequences during the sizing and weaving processes. Moreover, it was found that the factors causing this evil were also operating to lessen the efficiency of the machines used in preparation. Attempts to modify the system have led to the high speed winding and warping plant. The new system takes three main forms:—

(a) Winding on to parallel cheeses (i.e., packages of yarn in the shape of a cheese) and warping from the side.

(b) Winding on to cones, and warping from the nose.

(c) Winding on to bottle bobbins and warping from the nose.

The different forms of the new system have been widely adopted in some other countries, particularly the United States, but they have not gained much foothold in this country.* Indeed, there does not appear to have been one installation in Lancashire of the Barber-Colman system—the latest and most efficient of the forms of high speed winding and warping. Some of the reasons for this have already been referred to when dealing with high drafting. The new methods have been perfected in a period when the depression in the Lancashire cotton industry made owners reluctant to invest new capital in concerns which were not making profits. Moreover, the new systems only yield their greatest advantages under conditions of mass production which have not been found in Lancashire since 1921, due to the nature of the goods produced, and the prevalent hand-to-mouth buying and manufacture.

If, as appears likely, these obstacles to the use of the new devices continue to operate, and since the numbers of workers engaged in the preparatory processes are much smaller than those engaged

* Statistics are extremely scanty, but it appears that there are at least 2,500,000 winding spindles of different types engaged in the preparation of warps and hosiery yarns in Lancashire. Of these there would seem to be only 10–12,000 high speed spindles.

actually in spinning or weaving, it does not seem that any substantial displacement of labour will be created here. Wherever the new methods are introduced, however, output per head usually increases, and unless a larger output is required, labour is displaced, particularly with the Barber-Colman system. In two mills investigated, one producing 100,000 lbs. of warp per week, and the other 48,000 lbs., the labour required under the new and the old systems is as shown below. It will be noticed that only in one case was there a reduction of the number of employees.

	<i>Old System.</i>		<i>New System.</i>	
	<i>Mill C.</i>	<i>Mill D.</i>	<i>Mill C.</i>	<i>Mill D.</i>
Women and Girls	187	87	196	56

It is possible to make fairly accurate estimates of the amount of labour which would be required in winding and beaming in a typical mill with a standard weekly output for each of five different systems of preparation. These are shown below, the systems running from the less to the more modern.*

	<i>System.</i>	<i>Winders.</i>	<i>Beamers.</i>	<i>Creelers.</i>	<i>Mechanics.</i>	<i>Total.</i>
1	...	45	11	—	—	56
2	...	45	4	3	—	52
3	...	36	4	1	—	41
4	...	28	2	2	—	32
5	...	8	3	2	1	14

It appears, therefore, that important reductions in the demand for labour will come only with system 4 (High Speed Cone) and system 5 (Barber-Colman), and that the reduction will be very much greater with the latter.

III.—The “ More Looms per Weaver ” System.

In the preceding sections dealing with high draft spinning and high speed winding and warping it has been suggested that the introduction of the new methods is not likely to be rapid, unless, indeed, radical changes in the structure of the industry take place, and that, in consequence, the labour problems raised will not be of very great importance. In the case of the “ more looms per weaver ” system, however, there is reason to believe that there will be changes in weaving practice in the near future and that, as a result, important issues connected with surplus labour may present themselves.

The non-automatic looms in Lancashire can be divided in accordance with the structure of the cloths they are intended to weave. The main classes are plain tappet looms, motion looms, dobby looms, and Jacquard looms. The first type is only capable of weaving cloths of simple structure. The last three types are modifications of the plain tappet loom, and the plain tappet loom, at little expense, may be converted to weave the cloths which the

* See Appendix 5, Table V.

other types are designed to weave.* All four types have this feature in common, however, that they can weave plain cloth.

The bulk of the cloths produced in Lancashire before and since the War have been woven on looms of the plain tappet or motion types. The "variety trade" has been catered for by dobbie and Jacquard looms and by the plain tappet and motion looms in association with the textile printing and dyeing processes.

It is customary to give four non-automatic looms to an operative on certain Lancashire standard cloths of a simple and light structure, such as printers, bleachers, poplins, twills, and jeans. But the number of looms that a weaver is capable of tending depends upon numerous factors, of which the following are most important—type of cloth; width of loom; time spent on re-shuttling; time spent on extraneous duties; warp breakage rate; mechanical condition and speed of looms; efficiency of operative. A weaver may be unable to attend to as many as four looms weaving cloths of complicated or wide structure. Very frequently the amount of re-shuttling (i.e., the replenishing of the weft supply package) called for where the coarseness of the weft restricts the length of yarn on the package, may reduce the number of looms which a weaver can control.

Under the "more looms per weaver" system on non-automatic looms, the attention of the weaver is confined to skilled duties at and for the loom—such as finding and repairing broken warp ends, re-shuttling, taking up slack warp ends and attending to the warp tension weights—and all subsidiary duties—such as weft and cloth carrying and sweeping, oiling, and cleaning of looms—are delegated to less skilled and cheaper labour.† Under these systems, production per loom is not increased, but a higher production per weaver and lower weaving costs are obtained, whilst the weekly earnings of the weaver are maintained or slightly increased.

During the last three years, close attention has been directed to the economies of the various forms that the system may take. Whilst, up to the present time, it has made little progress, the history of the negotiations which have proceeded between employers and the weavers' trade unions, and of the experiments which have already been conducted, makes it possible to detect the leading elements in the problem of its introduction.

At the end of November, 1928, the Burnley Cotton Employers' Association and the Burnley Weavers' Association commenced a

* Thus, a dobbie loom merely consists of a plain tappet loom with the addition of a "dobbie machine" which permits the weaving of a restricted range of figured goods. Again, a Jacquard loom is merely a plain tappet loom converted to receive a complex "Jacquard machine" which permits the weaving of an unrestricted range of figured goods.

† In many cases warp stop motions have been applied to ordinary looms in order to alleviate mental strain involved in watching for broken warp ends. Other expedients for assisting the weaver have been the running of looms at a lower speed, and the provision of larger shuttles and bobbins with re-wound weft.

series of discussions on the running of eight looms per weaver, which resulted, toward the end of April, 1929, in the launching of an experiment at the mills of about a dozen firms in the Burnley district.* A condition of the experiment was that weavers would be relieved of the duties of sweeping, cleaning and oiling the looms, and of weft and cloth carrying. Some of the firms used large cops with a view to reducing the amount of re-shuttling. All the firms reduced the speed of their looms, some more than others.

This experiment proved that the introduction of the eight looms system, weaving the Burnley "Printer" and other similar cloths, would effect a saving in weaving wages of from 20 per cent. to 30 per cent., which, in association with the cost of the raw material and overhead charges, would reduce the cost of production of cloth by from 2 per cent. to 7 per cent.†

In the course of the negotiations which followed this experiment, the contentions of each side were made fairly clear. The employers' organisations desired that a "County" agreement on "more looms" should be arrived at, in order that the system might be introduced by orderly and controlled stages. It was feared that, in the absence of such an agreement, individual concerns which were outside, or disloyal to, these organisations would adopt the system and thereby gain an unfair advantage. The trades unions' criticisms were directed mainly against the wage proposals of the employers and the displacement of labour which the system would produce. They demanded not only a higher level of weekly earnings than the employers had suggested, but also (1) a "minimum" wage for running looms as a safeguard against a lowering of the standard and quality of yarn, and (2) a "fall-back" wage to counteract under-employment (i.e., the employment of weavers on fewer than eight looms, but at the lower piece rates adopted for the eight looms system). In reply, the employers re-asserted their view that the process of displacement of labour could be controlled so as to minimise the hardships to those affected, and reminded the workers that unless drastic measures were taken to reduce weaving costs it might be that still further loss of business would cause a greater volume of unemployment than would follow from the introduction of the "more looms" system. Repeated attempts

* The experiment was confined to 4 per cent. of the looms at these mills. At first, a fixed wage of 50s. per week per weaver on eight looms was paid. The average wage of a Burnley weaver engaged on four looms weaving plain cloth is about 40s. per week.

† At the present level of weaving wage rates, the weaving labour cost for four looms on a standard Lancashire cloth such as the Burnley "Printer," is about 24 per cent. of the conversion cost of weaving, the cost of the raw material alone being about 64 per cent. Of course, the weaving labour cost as a percentage figure will oscillate more or less inversely as the price of the yarn.

of the representatives of employers and operatives to settle the problem have so far yielded no tangible result.*

The only other event at all comparable in importance with the Burnley experiment has been the conclusion recently of an agreement between Messrs. James Nelson Ltd. of Nelson, and the Amalgamated Weavers' Association, which has permitted the firm mentioned to commence experiments at their mills in Nelson and Colne on the production of certain standard and speciality cloths on "more looms" systems, the quota of looms per operative not to exceed eight. While the scheme has not yet been running long enough to make a study of comparative costings useful, it is of interest to note the leading features of the experiment as disclosed by the terms of the above-mentioned agreement:—

1. The firm, being desirous of instituting an experiment in the Nelson and Colne districts, on the production of cotton cloths such as Twills, Sateens (50 ins. to 60 ins. wide), Gaberdines, Poptins, Venetians, Dobbies and Jacquards, and different classes of silk and artificial silk goods on not more than eight ordinary Lancashire looms to a weaver, with warp and weft stop motions, hereby undertake to pay a wage of not less than 58s. per week of 48 hours for the production of the above-named classes of cotton piece goods, irrespective of the number of looms (up to a maximum of eight) run during the experimental period; and 60s. per week on all classes of silk, artificial silk, and artificial silk and cotton mixture cloths.

2. Under "silk and artificial silk," it is understood that the term covers silk warp and cotton weft, cotton warp and silk weft, or any mixtures of the two together; whatever the percentage of silk is either in weft or warp, it is to be classified as silk.

3. An agreed bonus system shall be at once instituted which will increase the earnings of the weavers above 58s. and 60s. per week.

4. The speed of the looms will be determined by experience and reports will be presented by outside investigators. The firm are prepared to accept inspectors either from the Shirley Institute or the Industrial Fatigue Research Board to investigate and examine conditions at the mills, and make independent reports to the Association either weekly, fortnightly, or monthly.

5. That all silk and artificial silk weft supplied to the weavers shall be re-wound, and that the two and three-fold cotton weft shall be supplied to the weavers from the process which the firm have in operation.

6. That on singles cotton counts the firm shall provide large cops, but that where the weft is coarse and imposes hardship and strain upon the weavers, consideration shall be given, on approach being made to the firm, for this material to be re-wound. The counts on which the re-wound weft shall be provided to be determined by joint consultation.

7. Yarns will be carefully selected and prepared, in order to reduce breakage to a minimum. The firm will supply all ancillary labour for sweeping, cleaning, oiling, cut and weft carrying. New preparatory machinery will be required, and the displaced labour, if any, in the weaving sheds, will be given the first available opportunity of these alternative employments. The wages and conditions for these operatives to be subject to further consideration and arranged to the satisfaction of both sides.

* One lamentable event in the protracted controversy was the lock-out of the whole weaving section in January and February, 1931, in support of several Burnley employers whose operatives had been called out on strike by the Weavers' Amalgamation in an attempt to compel those employers to discontinue the eight looms system. The immediate result was the general resumption of weaving on the old system in February.

8. At the end of whatever period is required to complete the arrangements for this experiment, it is understood that a new piece price list basis should be formulated, and the firm hereby agree that in this list provision shall be made for a fall-back wage, whenever the weaver is at work.

9. No deduction shall be made from the weavers' wages under this system for the production of alleged unmerchable cloth.

The effect which the "more looms" system will have upon the demand for labour will naturally depend upon how widespread the system becomes in the near future, and this, in turn, involves a number of other considerations:—

✓ (1) The primary factor is how early the employers' organisations and the trade unions can come to some general agreement regarding the conditions upon which the system shall be worked. At the time of writing (December, 1931) there appears to be some hope of an agreement being reached but the repeated failure in the past of promising negotiations makes it unwise to put too great confidence in this.

(2) If such a general agreement is not reached, it is certain that more concerns will, in the future, break away from existing agreements, as many have already done, and institute "more looms" systems independently.

(3) The extent to which, and the speed at which, the system will be introduced will depend mainly upon the savings that can be effected in it. It was found possible in the course of the Survey to make direct investigations in four mills which had experimented with the eight looms system. This sample was small, and the range of cloths produced limited, but these cases strongly suggested that the reduction in the total cost of the cloth under the new system was 2-7 per cent. and the reduction of weaving labour cost, 20-30 per cent.* This may be a sufficient gain to encourage weaving firms to change over to the new system and, if so, it may place firms retaining the four looms system at a competitive disadvantage against those which have adopted the eight looms system.

(4) A further vital, and yet immeasurable, factor is the proportion of the weaving section of the industry which would be affected by the transition to a "more looms" system. Some cloths admittedly cannot now be produced under this system, others can. But what part of the total production falls into each of these two classes cannot be exactly determined. The most divergent answers have been received on this point but two generalisations appear to be safe. Firstly, the types of cloth which are capable of being woven on a "more looms" system are a matter for experiment. Up to the moment experiments have been relatively few, and on a small scale. If the system gained wider application, increased experience and knowledge might enable it to be practised on a wider range of cloths than is the case at present. Secondly, even now,

* See Appendix 5, Tables VI—VIII.

whilst technical experiment has far to go, a considerable proportion of the cloths woven might be produced on the new system. There are cases where the finest cotton cloths and artificial silk and mixed fabrics are being woven eight looms to a weaver, though here such automatic devices as warp stop motions are generally being used on the looms. One authority gave it as his opinion that the system might be applied to 60 per cent. of the cloths now being woven. Others have stated that, given a comparatively short period of general and intensive experiment, the proportion would be much higher.

(5) Finally, it must not be overlooked that, apart from wage reductions, the "more looms" system presents the only available method of reducing weaving costs, *without further capital expenditure*. At a time when there are weaving firms which have been living for long periods on their capital, and when the normal channels of obtaining fresh supplies are closed, this must be an important influence in determining the degree to which the new methods will be adopted.

There seems to be little doubt, therefore, that if the way is made open for the "more looms" system by agreement between employers and trade unions, it will be found profitable to turn large numbers of looms over to the system. It now becomes necessary to determine what changes in output per weaver the system will bring and what displacement of labour will take place if aggregate output does not increase.

The influence of the "more looms" system upon output per head is not as direct as it may appear superficially, and that largely because of the diversified practice found from mill to mill. Output per head will, of course, be determined mainly by the number of looms per weaver. But the number of looms which one weaver can operate will depend upon a number of factors. The major factors are :—

1. The speed, width, and type of the loom.
2. The counts of weft and size of weft package.
3. The application of attachments designed to facilitate supervision by the weaver.

There are also the following minor factors :—

- (a) The condition of the weft, spun or rewound.
- (b) The quality and setting (i.e., the number of threads per inch) of the warp.
- (c) The "tackling" (i.e., condition) of the loom.
- (d) The efficiency and organisation of attendant labour.

It does not necessarily follow that, because a weaver formerly attended to four looms weaving a certain cloth, she can supervise eight looms weaving the same cloth on the new system. On her four looms she may have been working slightly beyond her optimum capacity, and was willing to do so on account of the addition to her weekly wage accruing from the fourth loom. On a "more looms" system her ability to work slightly beyond her real capacity would be more severely taxed, and the increase in mental and

physical strain be entirely dis-proportional to the increase in the number of looms under her charge. Further, her capacity for superintending more looms must necessarily be governed by the time formerly occupied in performing duties extraneous to actual weaving, e.g., cloth and weft carrying, oiling and sweeping, and by the time formerly available for inspecting the cloth for faults during weaving. On the other hand, a re-adjustment of the loom speeds, together with the provision of devices for time-saving wherever possible, would increase the weaver's ability to work more than four looms. As an example, the details of the number of looms of average width, using 30's weft, which theoretically might be operated by each weaver may be put in summary form :—

With Re-wound Weft (30's weft).

- (a) With weft carried and looms cleaned by other labour, the weaver might look after eight looms.
- (b) With warp stop motions on the looms, the weaver might look after eight looms and do cleaning and weft carrying also, although this is doubtful.
- (c) The weaver might look after six looms without warp stop motions and do cleaning and weft carrying.
- (d) With weft carried, looms cleaned, and stop motions fitted, the weaver might look after ten looms.
- (e) With weft carried, looms cleaned, stop motions fitted, and a shuttle loader employed, the weaver might attend to twelve looms.

With Large Cops (30's weft).

- (a) Six looms per weaver, if cleaning and weft carrying are done by others.
- (b) Six looms per weaver, if looms are fitted with warp stop motions.
- (c) Eight looms per weaver, if cleaning and carrying are done by others and warp stop motions are fitted.
- (d) Eight looms per weaver, if cleaning, carrying and cop skewering are done by others.
- (e) Ten looms per weaver, if cleaning and carrying are done by others, warp stop motions fitted, and cop skewerers employed.

In an attempt to produce general figures of the effect of the "more looms" system upon output per head, the following procedure has been adopted. A large group of standard "bulk-trade" cloths were taken which are known to be woven on the "more looms" system. From first-hand enquiry at mills, output on four, six and eight loom systems was determined. By taking a simple average of the details regarding the cloths dealt with the following composite table was drawn up.

Weekly Output per Weaver.

	<i>Linear Yardage.</i>		
4 Looms per Weaver	100
6 Looms per Weaver	140
8 Looms per Weaver	184

The full technical details upon which this table is based are given elsewhere.* Here, it is extremely important to note the reservations which attach to these figures.

* Appendix 5, Table IX.

(1) They are averages grouped together in a rough fashion and they cover widely varying changes in output per head, consequent upon the "more looms" system, in different mills. The precise result obtained in any mill varied with the nature of the cloth considered, the speed at which the looms were run, the proportion of "learner" weavers normally employed, the amount of under-employment in existence, and many other factors.

(2) The cloths actually taken, whilst all "standard" cloths, are only a few of the host of "standard" and "hybrid" cloths being woven, so that the sample may not be representative of the bulk trade in those cloths which are suitable for manufacture by a "more looms" system.

Nevertheless, the sample, and the details regarding it, are probably good enough to substantiate the extremely important conclusion that, in the cloths which can be woven on a "more looms" system, output per weaver is greatly increased by working six or eight looms to a weaver—in the latter case by about 80 per cent.

It is now necessary to introduce a qualification which modifies the extent of labour surplus resulting from the introduction of the new system. When a weaver tends six or eight looms, certain incidental unskilled work, formerly carried through by her, must be performed by other additional labour which will necessarily have to be employed. To what extent will this reduce any surplus that may be created? Here again the answer depends upon the nature of the mill, the cloth and the conditions being studied. Mills have been visited to obtain information of the numbers of these additional workers required for a given output, but it will be more satisfactory to give a hypothetical case in which the staffing arrangements estimated are based upon what has been found to be the normal procedure in the experiments which have been conducted. The mill is one with 1,250 looms manufacturing a standard "Bleacher," 34½ ins. wide. The estimate is based upon the assumption that, as far as possible, male weavers will be retained after conversion to the new method, not because this has so far been the custom but because, looking at the matter from a broad social view-point, this would seem desirable. The details are as follows:—

	<i>4 Looms System.</i>	<i>8 Looms System.</i>
Weavers—		
Male	107	101
Female	200	49
Learners	11 (with 2 looms).	1 (with 6 looms). 11 (with 4 looms).
Sweeping and Oiling	} Not required on Four Looms System.	25 Females.
Weft Carrying		25 Females.
Cut Carrying		7 Males.
	<hr/> 318 <hr/>	<hr/> 219 <hr/>

		<i>Males.</i>	<i>Females.</i>	<i>Total.</i>
Four Looms System		111	207	318
Eight Looms System		111	108	219

The result is to show that, even when allowance has been made for the additional labour required for sweeping, oiling, weft carrying, cut carrying, etc., there still remains a very high percentage of displacement in this particular case.

One further qualification must also be made. In the case of the mill of 1,250 looms taken above as an example, whilst the output per weaver would increase, the total output of the mill would be likely to fall slightly. The allowance that should be made for this will vary from one set of conditions to another, but if we take average figures of a 5 per cent. increase in loom efficiency and a 10 per cent. decrease in loom speed following the introduction of the "more looms" system, this would necessitate a further addition of about 5 per cent. to the labour required in the mill, *to maintain the volume of output.*

To summarise: the reservations which have continually been stressed must be borne in mind, but it appears that the introduction of the eight looms system on the cloths to which it has been applied up to the moment might, in an average case, be expected to reduce the number of workers required for a given output by about 30 per cent.

In the light of the suggestion which has already been made that there is a relatively wide field for the "more looms" system, this conclusion is of great significance and may be made clearer by a hypothetical example. Burnley has always been noted for the weaving of "Printers" and in this class of trade the "more looms" system could be easily adopted. If it is assumed that 30,000 looms, one-third of those "in place" in Burnley, are turned over to the eight looms system, the labour required for the maintenance of the same output can be estimated roughly as follows:—

Estimated labour required for 30,000 looms on 4 Looms System	7,700
Estimated labour required for 30,000 looms on 8 Looms System (3,900 weavers; 1,300 weft and cut carriers, sweepers, oilers, etc.) ...	5,200
Redundant labour, if output remained the same	2,500

If, therefore, the "more looms" system becomes prevalent, in the immediate future, further labour surplus might well be added to that already existing in the weaving towns. This constitutes a problem which demands the most careful joint study by employers and trade unions in the hope that some plan may be evolved under which dismissals would be made in a way which would minimise the effects of any increased unemployment.

IV.—Automatic Looms.

For many years after the invention of the non-automatic loom attempts were made to apply to it additional mechanisms which would relieve the weaver of such operations as re-shuttling, and of the mental strain involved in watching for broken ends. It was realised that by perfecting a loom capable of automatically replenishing the supply of weft, and of automatically stopping itself when a warp thread broke, the number of looms to which a weaver could attend might be greatly increased. The development of these early mechanisms has produced the modern automatic loom, of which there are two kinds, the fully automatic and the semi-automatic. The former may be defined as "a loom which requires no attention from the weaver unless it stops automatically." There is much ambiguity in the industry as to the meaning of the term "semi-automatic", but the following definition seems most appropriate: "a loom which has had applied to it an automatic weft-replenishing device, together with any other fully automatic loom features, but which is still deficient in one or more of such features."

The number of automatic looms which a weaver can follow depends upon the skill of the weaver; type of cloth; width, speed and condition of looms; warp breakage rate; supply and organisation of auxiliary labour; administrative efficiency in the mill management, etc. The number varies considerably in this and other countries. It may be as low as six or as high as one hundred, but in this country it is generally round about twenty-four.

The automatic loom has never been popular in Lancashire. The proportion of automatic looms, or looms with automatic attachments, to total looms is very much lower in this country than among our most important competitors. Only about 60 mills in Lancashire have automatics and about 30 mills looms with automatic attachments, and it is extremely significant that the majority of these mills also run non-automatic looms. A recent Census revealed that of the total automatic looms, seven firms controlled more than 65 per cent., and of the automatic attachments 85 per cent. were owned by three firms.

Many reasons are advanced for the slow growth of automatic weaving machinery in this country: the specialisation of spinning and weaving, the character of the goods produced, the difficulties encountered in working double or treble shifts, the high capital cost of the installation, etc. Whatever the factors at work, there seems no reason why they should not be as strong in the near future as in the past, and, in consequence, it does not appear likely that any immediate labour problem will be raised by the increased use of automatic looms. However, any plant which does change over creates much redundant labour as the following illustration shows:—

Mill Weaving Standard "Bleacher," 34½ ins. wide.

	<i>Four Looms System.</i>	<i>Automatic Looms System (bobbins changers).</i>
Weaving Shed Labour—		
Male Weavers	107	25
Female Weavers	200	—
Learners	11	10
Smash Piecing	} None	16 Females.
Sweeping and Oiling		25 "
Battery Filling		31 Males.
Cut and Weft Carrying		7 "
	318	114

CHAPTER 6.

THE METAL AND ENGINEERING TRADES.

The Metal and Engineering Trades in the Survey Region are both large and diverse. In 1930 the total number of insured persons in the Survey Region in the four main industrial groups—Metal Manufacture, Engineering, Construction of Vehicles, and Metal Trades—was 199,510, which was 9.2 per cent. of the total in Great Britain and Northern Ireland. Practically every branch of these trades is found located in the Region, but the heavier processes, blast furnaces and steel mills, are less well represented than others. The most important branches are General Engineering; Electrical Engineering; Motor Vehicles, etc.; Electric Cables, Wire, etc.; Wire and Wire Netting; Steel Melting, Iron Puddling, etc.; Railway Carriage Construction; and Grates, Pipes, etc.

Broadly speaking, these industries in the Survey Region can be said to have held their own in relation to the whole country in the past seven years, but the almost continuous decline in Textile Engineering has led to some relative loss in General Engineering, and the depression of 1930 and 1931 has undoubtedly hit the Lancashire industries more severely than those in Great Britain. These points are brought out in Table I.

The industries are found mainly in the southern part of the Region. General Engineering is, however, widely scattered, principally because the textile engineers have found it convenient to be in close touch with different parts of the cotton industry. But even in this case, the Manchester and Trafford Park areas account for over 40 per cent. of the insured employed, and their relative importance is increasing (Table II). In Electrical Engineering more than two-thirds of the insured employed are found in the growing industrial area around Trafford Park, whilst in the manufacture of Electric Cables, etc., about four-fifths of the insured employed are in the Trafford Park, Oldham or Bolton Areas

(Table II). Wire and Wire Netting manufacture is found for the most part either in Manchester or in Warrington, particularly the latter. The remaining trades are concentrated in the environs of Manchester.

TABLE I.

Total Insured Employed Persons in Certain Branches of the Engineering and Metal Trades in the Survey Region and Percentage of Numbers in Great Britain and Northern Ireland, July 1923, 1929, 1930, 1931.

Industry.	Numbers.				Percentage— Survey Region to Great Britain.			
	1923.	1929.	1930.	1931.	1923.	1929.	1930.	1931.
General Engineering, etc.	91,414	85,753	68,869	54,579	17·1	16·0	13·8	13·2
Electrical „ ...	13,770	18,704	18,941	16,796	23·6	23·2	22·8	21·2
Electric Cables, etc. ...	6,809	10,117	10,019	9,575	10·4	11·3	10·6	10·3
Wire, Wire Netting, etc....	6,890	6,722	5,800	5,193	30·8	33·2	31·5	32·5
Motor Vehicles, etc. ...	10,099	11,653	10,836	11,513	5·7	5·1	5·0	5·8
Stoves, Grates, Pipes, etc.	5,138	5,487	4,801	4,368	7·2	6·8	6·3	6·3
Railway Carriages, etc....	6,334	6,173	5,640	4,883	12·8	12·5	11·6	12·3
Steel Melting, Iron Puddling, etc.	8,879	6,103	5,236	3,602	5·2	4·2	4·1	4·1

TABLE II.

Percentage Geographical Distribution of Insured Employed Persons in General Engineering, Electrical Engineering and Electric Cables, etc., in the Survey Region, July, 1923, 1929, 1930.

GENERAL ENGINEERING.

<i>Sub-Area.</i>	<i>1923.</i>	<i>1929.</i>	<i>1930.</i>
Blackburn, etc. ...	9·7	8·9	9·0
Bacup, etc. ...	0·4	0·4	0·3
Oldham, etc. ...	12·9	10·3	7·4
Bury, etc. ...	9·8	8·3	8·3
Stalybridge, Hyde, etc.	8·1	7·9	7·7
Bolton, etc. ...	6·3	7·1	6·0
Wigan, Atherton, etc. ...	5·6	5·1	5·4
St. Helens, Runcorn, etc.	3·8	4·5	5·0
Preston, Chorley, etc. ...	2·6	2·5	2·3
Trafford Park ...	11·0	13·5	14·8
Burnley, etc. ...	2·7	2·1	2·0
Manchester, etc. ...	26·4	29·2	30·5
Others ...	0·7	0·2	1·3
Total ...	100·0	100·0	100·0

ELECTRICAL ENGINEERING.

Preston and Chorley, etc.	13.7	4.9	7.0
Trafford Park, etc.	71.5	68.8	68.8
Others	14.8	26.3	24.2
Total	100.0	100.0	100.0

ELECTRIC CABLES, ETC.

Oldham, etc.	24.0	32.2	31.8
Bolton, etc.	21.2	24.3	23.6
Trafford Park, etc.	32.8	23.1	22.7
Others	22.0	20.4	21.9
Total	100.0	100.0	100.0

For a more detailed analysis it will be necessary to consider the sections separately since conditions and trends vary greatly from one to another.

General Engineering.

On the whole this industry has suffered a fairly steady decline in employment with a very heavy unemployment rate. The position has, however, been much improved by a substantial decline in the number of men attached to the industry, amounting, over the period 1923 to 1931 to about 22,000. Unemployment fell from 24.1 per cent. in 1923 to 15.5 per cent. in 1929, but rose in 1930 to 31.2 per cent., and in 1931 to 43.3 per cent. The total number of insured persons unemployed has not fallen in any year below 15,000, the great bulk of these being men. (Table III.) The incidence of unemployment has been much heavier in the Blackburn, Oldham and Bolton areas than in the Manchester district. This is due to the preponderance of textile engineering in the first-named areas and the intense depression existing in that section of general engineering.

TABLE III.

GENERAL ENGINEERING.

*Numbers of Insured, Unemployed and Employed Persons, distinguishing between Men, Women, Boys and Girls. Survey Region.**

Year.	Number of Insured Persons.					Numbers Unemployed.					Insured Employed Persons.				
	Men.	Boys.	Women.	Girls.	Total.	Men.	Boys.	Women.	Girls.	Total.	Men.	Boys.	Women.	Girls.	Total.
1923	108,090	6,550	5,030	760	120,430	28,022	696	274	24	29,016	80,068	5,854	4,756	736	91,414
1924	100,950	5,910	4,780	580	112,220	23,603	509	316	11	24,439	77,347	5,401	4,464	569	87,781
1927	93,900	5,870	4,680	650	105,100	14,866	199	199	16	15,280	79,034	5,671	4,481	634	89,820
1929	89,820	5,950	4,880	790	101,440	14,991	276	400	20	15,687	74,829	5,674	4,480	770	85,753
1930	88,190	6,090	5,100	700	100,080	29,420	764	961	66	31,211	58,770	5,326	4,139	634	68,869
1931	85,430	5,360	4,920	550	96,260	39,509	876	1,228	68	41,681	45,921	4,484	3,692	482	54,579

* Numbers Unemployed, 1924, 1927, 1929 and 1930, average of March, June, September and December. For 1923, June, September and December. For 1931, March, June, September. No allowance for exclusion of persons over 65 years of age in 1929, 1930 and 1931.

With General Engineering, conditions are not uniform from section to section and further sub-division is necessary. The Ministry of Labour's industrial classification does not distinguish between the numerous trades included under General Engineering. Some indication of the relative importance of them may be obtained from the details which are provided by the Census of 1921 regarding "Lancashire and parts of Cheshire and Derbyshire". In that year, the total number of occupied persons in Engineering was divided as shown in Table IV below, bringing out clearly the importance of Textile Engineering and the Miscellaneous group.

TABLE IV.

*Total Occupied Persons in Engineering (not Marine or Electrical)
"Lancashire and Parts of Cheshire and Derbyshire" 1921.*

	<i>Numbers.</i>	<i>Percentage.</i>
Stationary Engines and Power Transmission Plant...	7,427	5.5
Steam Locomotives, Road and Rail, Railway Plant Manufacture.	15,091	11.1
Textile Machinery and Accessories	49,719	36.5
Machine Tools	6,041	4.4
"Other Engineering"	55,260	40.6
Total (including others)	136,262	100.0

1.—*Textile Engineering.*

The Textile Engineering industry has always been closely associated with the cotton industry; in 1921, 66 per cent. of the occupied population in the industry in the country was to be found in "Lancashire and parts of Cheshire and Derbyshire". Before the War, however, there was also a very large export trade in textile machinery. The Census of Production shows that, in 1907, 61 per cent. of the national production was exported; in 1924, 60 per cent.

Post-war conditions have robbed the industry of a large part of both the home and the export market. In the cotton industry in Lancashire the demand for new machinery has been small, partly because of the surplus machine capacity which reduced the price of excellent second hand machinery to one-third or one-quarter of its reproduction cost, partly because of the reluctance of cotton firms to experiment with new technical methods, and partly because of a lack of capital and the uncertainty of the future. If it had not been for some demand arising out of the increased use of artificial silk, and the very general tendency for looms to be re-equipped for the production of finer cloth, the paralysis of the home market would have been even more complete. At the same time, the volume of exports has fallen considerably below the pre-war level, although from time to time a large trade has been done with Russia. In the table below the use of a weight unit may cover important changes in the quality of exports, but there can be little doubt that it reveals a marked shrinkage in the export trade.

TABLE V.

Exports of Textile Machinery from the United Kingdom.*

	<i>Tons.</i>		<i>Tons.</i>
1911-13	157,616	1926	101,541
1913	178,074	1927	119,299
1921	157,044	1928	125,210
1922	154,396	1929	126,553
1923	138,658	1930	91,212
1924	103,618	1931†	38,779
1925	123,107		

* Including all branches.

† 9 months.

The net reaction upon the industry in Lancashire cannot be indicated with any accuracy, but, for the whole country, output in 1907 was £12,700,000 and in 1924, £14,000,000. When allowance is made for the higher price level ruling at the latter date the decline in the volume of output must have been serious.

The presence of a large surplus of productive capacity has led to long periods of ruinous competition and unprofitable selling. At the time of writing an amalgamation is in process of formation which contemplates the grouping of the largest concerns in the industry. What effect this is likely to have upon efficiency and the future volume of trade cannot be estimated, but the elimination of surplus machine capacity cannot but have advantageous results in clarifying the position regarding surplus labour, much of which, since 1921, has worked upon short-time.

It is not possible to indicate exactly what changes in employment have resulted from the broad trends in this industry, but there can be little doubt that since 1925 the numbers employed have shown a steady decline. In the table below the figures of "cards exchanged" by about 70 textile machinery and accessories firms in

* In order to facilitate the work of exchanging new Unemployment books for old, at each July, it has become fairly common for Employment Exchanges to deal in bulk with the books of the employees of one concern, instead of each employee making a personal exchange. The number of "cards exchanged" by any one concern will, broadly speaking, represent the numbers of insured persons employed by that concern in some week near to July. The figures obtained in this way may fail to measure employment in the actual week of the exchange for a number of reasons:—

(a) Even when books are exchanged "in bulk," the individual employee retains the right to take his own card to the Exchange for transference. Such cases, however, are few in number.

(b) In practice, in order to prepare for the actual physical exchange of books, it is customary for the Employment Exchange to take the books from the firm before the date of the actual exchange. The "cards exchanged" figures therefore relate to numbers employed at the earlier date and not at the exact date of exchange.

(c) The pressure of extremely heavy unemployment has, in some cases, made it convenient for Unemployment Books of unemployed persons to be retained by the firm with which they are normally employed. In such cases the "card exchanged" figure would include a number of cases of persons actually out of work.

[Cont. on next page.]

the Survey Region have been grouped together. They show a marked downward trend with a serious fall in 1930.

TABLE VI.
"Cards Exchanged" by 71 Textile Machinery Firms.

	1929=100.				
1925	19,968	108·3
1926	14,983	81·3
1927	19,335	104·9
1928	18,989	103·0
1929	18,433	100·0
1930	12,333	66·9

For a number of reasons, it appears that this industry will be compelled to adjust itself in the immediate future to a permanently lower scale of output, and that the labour force must be reduced if it is to find full-time employment:—

(1) The cotton industries of the world are already seriously over-equipped; the process of over-expansion which occurred in England before the War has apparently been repeated in Japan, India and the United States since the end of the War. The tendency towards over-expansion in every industry consisting of small units is strongly exemplified in cotton, and this process has been accentuated by the migration of the industry in some countries, particularly India and the United States, from one area to another which is usually accompanied by the appearance of surplus capacity in both.

(2) In Lancashire the influence of the existing surplus upon future demand for machinery is specially strong. Capital equipment is being written down to extremely low prices and still cannot be disposed of. If the cotton industry entered upon a general process of technical reorganisation then, of course, the demand for new machinery would be very large, for any radical change in methods would involve the wholesale discarding of the type of machinery upon which, in the past, Lancashire has relied. But this is hardly likely within the immediate future. On the other hand, the increasing use of automatic machinery will not, as is usually believed, decrease the total amount of machinery required for the production of a given quantity of goods. Automatic looms, for example, do not show a higher output per hour than ordinary power looms, and, although in spinning there are certain exceptions

In addition it must be remembered that many firms do not make this exchange in bulk, and details were only supplied to us of firms exchanging more than 20 cards. Moreover, in our industrial classification of firms we have been forced to adopt very rough methods based upon a very simple description of the nature of the work carried through by each firm.

Despite these difficulties, however, it appears from the few cases in which we have been able to test their accuracy, that the statistics of "cards exchanged" can be relied upon to provide a fairly reliable indication of movements of employment from year to year.

to this, on the whole the increasing use of automatic devices might have a beneficial result on the demand for textile machinery, even over a long period.

(3) In the future, competition in our export markets is likely to be more intense. The details of the export of textile machinery from the five countries—United Kingdom, United States, Germany, France and Switzerland—show that the proportion of the United Kingdom has fallen considerably since 1913 and appreciably since 1924.

Proportion, by Value, which Exports of Textile Machinery from the United Kingdom bear to Total Exports of such Machinery from the United Kingdom, United States, Germany, France, Switzerland.

	<i>Per cent.</i>		<i>Per cent.</i>
1913 ...	68.1	1927 ...	53.7
1924 ...	58.6	1928 ...	48.1
1925 ...	57.8	1929 ...	43.8
1926 ...	52.7	1930 ...	46.3

(4) The textile machinery industry in this country might presumably meet the declining trade by diversification of product. And, already, several large textile machinists in Lancashire have attempted to move out into other branches of engineering. At the same time English manufacturers do not appear to have been successful in meeting the increasing demand for machinery for the smaller textile trades, e.g., hosiery and knitting. In the table below the exports and imports of hosiery and knitting machinery are shown and they reveal the degree to which imports have increased in recent years.

TABLE VII.

Imports into and Exports from the United Kingdom of Hosiery and Knitting Machinery. 1921-1930.

	<i>Imports.</i>	<i>Exports.</i>		<i>Imports.</i>	<i>Exports.</i>
	<i>Tons.</i>	<i>Tons.</i>		<i>Tons.</i>	<i>Tons.</i>
1921 ...	599	308	1926 ...	1,820	336
1922 ...	904	274	1927 ...	1,767	438
1923 ...	749	383	1928 ...	3,181	414
1924 ...	1,192	289	1929 ...	2,359	377
1925 ...	1,512	298	1930 ...	1,493	294

2.—Machine Tools.

The machine tool industry in Lancashire is large, for, in 1921, "Lancashire and parts of Cheshire and Derbyshire" recorded 6,000 occupied persons in this industry, 31 per cent. of the total in England and Wales. Although the industry has had to meet serious foreign competition since the end of the War, the firms within it appear to have been extremely enterprising, and, from the number of cards exchanged by some twenty of the most important firms in the Region, it seems that employment was increasing up to 1929,

TABLE VIII.

"Cards Exchanged" by Twenty Machine Tool Firms in Survey Region. 1925-1930.

1925	...	...	3,501	1928	...	...	4,077
1926	...	...	3,540	1929	...	...	4,627
1927	...	...	3,877	1930	...	...	4,515

3.—Boilers, Prime Movers, etc.

It is not possible to do more than indicate roughly the general trends in this group since 1925. In boilermaking, many Lancashire firms have suffered from the turnover, which has been going on for many years, from the old type boiler (Lancashire, Cornish, Galloway, etc.), to the water tube boiler. Generally speaking, the firms engaged in making the former have not changed to the production of the latter. On the other hand, there are several very large, and growing, water tube boiler manufacturers in the area.

There are a number of large gas and oil engine manufacturers in the Region. Complete details are not available, but five of the largest gas engine firms, taken together, show the following "cards exchanged".

1925.	1926.	1927.	1928.	1929.	1930.
3,111	2,565	3,058	3,214	3,507	3,173

4.—Miscellaneous Engineering.

In addition to the foregoing groups there are, of course, many other engineering firms of miscellaneous type in the Survey Region. A very large number of these exchanged cards in bulk, and the details below for 185 firms suggest that employment was maintained between 1925 and 1929, although there was a drop in 1930.

TABLE IX.

"Cards Exchanged" by 185 General Engineering Firms. 1925-1930.

1925.	1926.	1927.	1928.	1929.	1930.
26,920	26,141	27,655	26,476	27,333	24,989

It may be summarised therefore in regard to general engineering in the Region that most branches of the industry have shown resiliency in the face of increasing competition. In textile engineering, however, the shrinkage of the market has been so serious that it appears that nothing short of a drastic elimination of surplus capacity will be sufficient to restore stability. Until that does take place much short-time working and quasi-casual employment constituting a serious problem for the textile engineering industry will continue.

Electrical Engineering.

The various branches of the electrical engineering industry are strongly localised in Lancashire. The 1921 Census showed that

34 per cent. of the total population occupied in the manufacture of generators, motors, transformers, switchgears, etc., and 28 per cent. of those occupied in making electrical cables, flex, etc., in England and Wales were found in "Lancashire and parts of Cheshire and Derbyshire". Both these branches have expanded considerably since 1923. Table X shows the substantial expansion of insured employed in electrical engineering, the great bulk of which is carried out by Metropolitan Vickers Electrical Co., Ltd., at their works in Trafford Park, where they employ more than ten thousand persons, and similarly in the industry manufacturing electric cables and smaller electrical requisites. In both industries large numbers of female workers are employed.

TABLE X.

*Insured, Unemployed and Employed Persons in Electrical Engineering and Electrical Cables, Wire and Flex, etc.**
Survey Region.

Year.	Electrical Engineering.			Electric Cables, Wire, Flex, Lamps, etc.		
	Insured.	Unemployed.	Employed.	Insured.	Unemployed.	Employed.
1923...	14,770	1,000	13,770	7,400	591	6,809
1924...	16,120	813	15,307	8,000	485	7,515
1927...	18,240	1,053	17,187	10,690	757	9,933
1929...	19,800	1,096	18,704	10,820	703	10,117
1930...	21,060	2,119	18,941	11,680	1,661	10,019
1931...	20,660	3,864	16,796	12,040	2,465	9,575

* Numbers unemployed, average of March, June, September and December, for 1924, 1927, 1929, and 1930; of June, September and December, for 1923; and of March, June and September for 1931.

Motor Vehicles, Cycles and Aircraft.

This group of trades shows fluctuating fortunes since 1923 although, on the whole, the employment tendency seems to have been in an upward direction until 1930.

TABLE XI.

Survey Region.

	<i>Insured Persons.</i>	<i>Unemployed.</i>	<i>Employed.</i>
1923	11,810	1,711	10,099
1924	13,400	1,372	12,028
1927	11,150	1,403	9,747
1929	12,860	1,207	11,653
1930	13,180	2,344	10,836
1931	14,680	3,167	11,513

At the same time the Survey Region does not appear to have commended itself as a permanent area for large scale manufacture of

motor cars. There are four very large firms in the Region and, of these, two have noticeably expanded since 1925, but the third shows a falling "cards exchanged" figure, and the fourth—Fords—is now on the point of removal to the South of England. The departure of this concern will seriously reduce the total employed in the industry in the Region for the Ford plant appears to have employed about 2,500-3,000 workers, but, fortunately, many of the workers are being transferred to Dagenham.

Constructional Engineering.

This is a small but expanding industry in the Region, concentrated largely in the Manchester area.

TABLE XII.

Survey Region.

			<i>Insured.</i>	<i>Unemployed.</i>	<i>Employed.</i>
1923	...	...	1,560	114	1,446
1924	...	...	1,570	130	1,440
1927	...	...	2,450	106	2,344
1929	...	...	2,660	263	2,397
1930	...	...	2,710	403	2,307
1931	...	...	2,500	717	1,783

Wire, Wire Netting, Wire Ropes.

This is another industry which is highly concentrated in Lancashire, the Survey Region containing about one-third of the total insured for Great Britain. Three-fifths of the insured employed in the Survey Region are to be found in the Warrington, St. Helens area. The numbers employed have fluctuated considerably since 1923 but, on the whole, have declined.

TABLE XIII.

Survey Region.

			<i>Insured.</i>	<i>Unemployed.</i>	<i>Employed.</i>
1923	...	...	7,680	790	6,890
1924	...	...	8,050	898	7,152
1927	...	...	7,490	1,172	6,318
1929	...	...	7,500	778	6,722
1930	...	...	7,820	2,020	5,800
1931	...	...	7,710	2,517	5,193

This appears to have been one case where changes in the method of production have seriously affected employment. One of the very largest firms is reported to be now producing, with approximately 1,000 workers, an output formerly requiring 1,500 workers.

Railway Carriage and Wagons, Tramcar Building.

The numbers employed seem to have fallen somewhat since 1927.

TABLE XIV.
Survey Region.

			<i>Insured.</i>	<i>Unemployed.</i>	<i>Employed.</i>
1923	...	...	6,680	346	6,334
1924	...	...	7,280	364	6,916
1927	...	...	7,690	271	7,419
1929	...	...	6,630	457	6,173
1930	...	...	6,350	710	5,640
1931	...	...	6,020	1,137	4,883

This is probably due to a decline in employment at the Railway Companies' engineering shops, attributable partly to the introduction of labour saving devices, and partly to the fact that re-organisation of these shops has led to the transfer of work outside the Survey Region. On the other hand, the private locomotive manufacturers have increased the numbers they employ.

Steel Melting and Iron Puddling, Furnaces, Rolling Mills, etc.

This branch of the metal industries is not important in Lancashire and the record between 1923 and 1930 suggests that it is tending to disappear altogether for unemployment has been rising whilst the insured population and the numbers employed have fallen.

TABLE XV.
Survey Region.

			<i>Insured.</i>	<i>Unemployed.</i>	<i>Employed.</i>
1923	...	...	10,670	1,791	8,879
1924	...	...	10,900	2,379	8,521
1927	...	...	9,640	2,712	6,928
1929	...	...	8,710	2,607	6,103
1930	...	...	9,210	3,974	5,236
1931	...	...	8,050	4,448	3,602

There is, however, one important development which may check this downward movement. Through the formation of the Lancashire Steel Corporation, the radical re-organisation of large steel and connected interests has been undertaken, a number of older plants have been closed down, and work is now in progress for the construction at Irlam of the most modern type of coke oven, steel rolling and billets and steel bars plant, with ultimately a rounding off of the complete process by the erection of blast furnaces. How far this will restore Lancashire to significance as a steel producing centre remains to be seen.

The Effects of Rationalization.

No industries could better exemplify the intricacies of measuring the effect of "rationalization" upon employment than the metal and engineering trades. The various kinds of industrial change usually grouped under the term "rationalization"—the tightening up of efficiency by the elimination of redundant staff, the elimination of clerical and administrative officials through the

amalgamation of firms, the increase of output per head by the use of labour saving devices—all these are to be found operating together. The trades produce such a wide range of products, changing considerably from time to time, that comparisons of output per head, even in the same plant, are made extremely difficult. Moreover, engineering as a whole shows a swifter and more continuous introduction of labour saving devices than do industries such as cotton or wool, and it is impossible to determine whether the changes which have undoubtedly been going on have been more rapid than before the War. Many of the firms from which information was obtained, after admitting that they were "speeding up" in various ways, remarked that this was but the normal progress which was a condition of survival.

When particular cases were examined it was found that those firms which have adopted the widest measures for increasing output per head were very often the concerns which showed the most important expansion in numbers employed. Obviously, the firms which are in the van of technical efficiency will tend to obtain orders at the expense of their competitors, both home and foreign, and we should expect to find the resultant unemployment, not among the employees of the "rationalized" concerns but among those firms which had fallen behind. On the other hand, to measure output per head over the whole of the trade would lead directly to the complexities of calculating what "output" meant when the products are infinite in kind, and constantly changing their character. In two cases, however, wire making and railway engineering, there does appear to have been a reduction in the numbers employed in the industry arising from technical changes.

Details were obtained, however, from a large sample of metal and engineering concerns of all kinds and certain generalizations can be made upon the basis of them:—

1. Most firms are constantly introducing methods which make for greater efficiency, and which, presumably, increase output per head. The rapidity with which they are introduced varies from one trade to another—it is more rapid, for example, in machine tool construction than in textile engineering—and from one concern to another. But, speaking generally, it is apparent that the maintenance of a given volume of employment depends upon a continually expanding market.

2. The numerous combines and arrangements between firms which have been made in recent years have not generally been accompanied by a decline in total employment. Thus the firms in one association of machine tool makers have increased their numbers, as measured by "cards exchanged", by nearly 50 per cent. between 1925 and 1930. A second important grouping in the same trade has been accompanied by an increase in numbers employed. A number of the larger cable makers in the Survey Region are grouped in an association, and again the numbers employed have, on the whole,

increased. A large amalgamation of electrical interests has been accompanied by a growing labour force. On the other hand, in certain cases where amalgamation has reduced employment, the concern has pointed out to us that, but for the combination, the reduction would have been greater still. In some other cases, increased employment in Lancashire has been due to concerns in the combine closing down plants elsewhere.

It appears, indeed, that, in many branches of engineering, individual firms are small enough to find substantial economies in fusion with others and that, so far as this is the case, a net increase and not a decrease in employment is likely to arise from it. Of larger groupings, such as the Lancashire Steel Corporation, it is not yet possible to speak with any certainty concerning the final effects of the re-organisation schemes which are being carried through.

3. Most of the 76 firms which gave information on improvements in technical methods reported an appreciable increase in output per head. All pointed out how dangerous comparisons over a period were, because of changes in the character and quality of products, but the estimates of those firms which hazarded a figure, are shown below.

TABLE XVI.

<i>Concern.</i>	<i>Estimated Increase in Output per Head, 1923-1930. Per cent.</i>
Cable Makers	15
Electric Motors	25
Electric Equipment	10
General Engineers	15
General Engineers	25
General Engineers	15
General Engineers	10-20
Gauge Makers	3½

On the other hand, many of the concerns which had attained increased efficiency and output per head also showed a considerable expansion in the numbers employed. One electrical manufacturer showed an increase of output per head of 25 per cent. and an expansion of employment of 80 per cent., and other similar cases were recorded.

To sum up : Our impressions are naturally influenced by the firms which have been good enough to give information, and it was clearly impossible to obtain this from all of the more than one thousand firms in the engineering and metal trades in the Survey Region. It would not, however, be unfair to argue that in the developing branches of engineering, particularly electrical engineering, machine tools and perhaps motor car engineering, the danger of unemployment arises not from technical changes but from their absence. These branches are growing so fast, their potential home and foreign market is so great, and their methods are so fluid, that falling costs arising out of increasing technical efficiency are likely to lead to

increased employment. On the other hand, in other branches, particularly textile engineering, the demand appears not nearly so elastic and increasing efficiency may be accompanied by unemployment. But technical changes in these branches do not appear to have been so important as in other sections.

CHAPTER 7.

THE COALMINING INDUSTRY.

The outstanding features of the coalmining industry in Lancashire and Cheshire are its age, its structure and the character of its market. It constitutes one of the oldest and most fully exploited of the existing working fields. This characteristic largely determines its competitive strength, output and employment capacity. A great deal of the coal produced is mined by collieries which are associated, in various forms of integration, with subsidiary concerns, and this dependence upon the home market is increased by the large market found in the industrial and domestic consumption of the area. Lancashire, indeed, is not even self-sufficient* in this respect, large imports coming into the county, particularly from South Yorkshire. Numerous faults divide the coalfield into several distinct sections. The Burnley area in the north contains many small mines producing coal of excellent coking qualities. The South Lancashire field in the south west and the Manchester field in the south east, containing larger mines, yield bituminous coal. There are, in addition, several minor strips of country worked.

Differences in technical practice naturally result in the individual collieries varying much in size as measured by the number of men on the books. Some collieries employ only one or two men, while others employ as many as 3,000. It will be seen from the table below, however, that the majority of collieries in the coalfield in 1930 were small and many of them employed less than 50 men. Most of the large collieries are in South Lancashire. In fact, there is no colliery employing more than 1,000 men in the outlying regions of the coalfield and few employing more than 500.

LANCASHIRE AND CHESHIRE.

Size of Collieries (1930) Classified according to the number of Persons on Colliery Books.

<i>No. of Persons on books.</i>	<i>No. of Collieries.</i>	<i>No. of Persons on books.</i>	<i>No. of Collieries.</i>
1-50	58	1,001-1,250	6
51-250	22	1,251-1,500	12
251-500	29	1,501-1,750	3
501-750	13	1,751-2,000	2
751-1,000	21	2,001-2,250	1

* For an estimate of the importance of the export trade see p. 161.

The industry is operated by about 100 separate concerns. These also vary greatly in size, but the number of collieries worked by each is naturally no indication of size, since a concern such as the Pemberton Colliery at Wigan, working a single colliery, may employ far more men than a company like George Hargreaves of Accrington, which works a dozen collieries. Two very large concerns, Manchester Collieries and the Wigan Coal Corporation, produce 37 per cent. of the output of the industry. Both have recently been formed by the amalgamation of previously independent companies. The former employs 15,000 men, works 20 collieries, and has a paid up capital of over £5,000,000. The latter is a subsidiary of the Lancashire Steel Corporation; employs 10,000 men, works 16 collieries, and has a capital of about £750,000. These two concerns, however, are exceptionally large. The majority of firms in the industry are quite small. It will be seen from the table below that nearly one-half of them employ less than 50 men, of which 22 actually employ less than 10 men. The larger undertakings generally employ between 1,000 and 5,000 men, and it will be seen that most, though not all, of these work more than one colliery. Large concerns are not, however, confined exclusively to South Lancashire. Although large collieries are not common in the areas of outcrop or shallow workings, yet there are several undertakings of considerable size operating a number of small collieries. Thus, the Exors. of John Hargreaves at Burnley employ over 2,000 men at six collieries and George Hargreaves of Accrington employ over 1,000 men at twelve collieries.

LANCASHIRE AND CHESHIRE.

Undertakings at Work December, 1930, classified according to the number of Persons Employed.

No. of Persons on Books.	Total No. of Undertakings.	Undertakings Working		
		One Colliery.	Two or three Collieries.	Four or more Collieries.
1-50	43	41	2	—
51-500	22	16	3	3
501-1,000	11	6	3	2
1,001-1,500	10	5	4	1
1,501-2,500	5	1	3	1
2,501-5,000	4	—	2	2
More than 5,000	2	—	—	2

It is worthy of notice that each of the different regions of the coalfield appears to be dominated by one or by a group of companies. Manchester Collieries, Ltd., works most of the deep pits in the district between Leigh and Manchester. The Wigan Coal

Corporation occupies the older central area round Wigan. In the St. Helens district the chief concern is Rd. Evans & Co., which employs about 5,000 men and has considerable interests in most other large companies in the vicinity. In the Burnley district the largest company is the Exors. of John Hargreaves, which has recently joined with two of its neighbours in erecting a new coking plant.

Since the small undertaking still survives so extensively it is natural to find that the simpler forms of capital organisation are predominant. Only about a dozen Public Companies exist, although, of course, these produce a very substantial proportion of the output of the industry. Many of the larger undertakings are private companies, whilst most of the smaller ones are merely private firms.

I.—Employment and Output.

The coalmining industry in Lancashire and Cheshire has shown a marked and, on the whole, a continuous decline in output and employment since 1922 with a tendency for the decline to become more rapid in the later years. In Table I details are given from different sources which are not strictly comparable but which, nevertheless, reveal the same general movements.

TABLE I.

*Employment and Output in the Coalmining Industry of Lancashire and Cheshire.**

Year.	(a) Insured Employed Persons.		(b) Numbers Employed.		(c) Output.	
	Actual.	1929=100.	Actual.	1929=100.	Actual 000 tons.	1929=100.
1922 ...	—	—	105,522	133·2	17,778	113·5
1923 ...	111,957	164·2	106,430	134·3	20,154	128·7
1924 ...	113,116	165·9	105,575	133·2	19,790	126·4
1925 ...	93,038	136·4	99,330	125·4	17,422	111·3
1927 ...	85,343	125·1	90,532	114·3	17,105	109·2
1928 ...	71,341	104·6	81,366	102·7	15,070	96·2
1929 ...	68,196	100·0	79,233	100·0	15,659	100·0
1930 ...	67,257	98·6	75,746	95·6	15,004	95·8
1931 ...	61,963	90·9	—	—	—	—

* In this table Col. (a) was obtained by deducting from the estimated numbers insured in July of each year, the monthly average of numbers unemployed. For 1923 the average of unemployed could be obtained only for the last six months. No allowance has been made for the exclusion of those over 65 years of age after 1927. Col. (b) represents the quarterly average of numbers employed (including clerks and salaried persons) in and about coalmines as published in the Annual Report of the Secretary for Mines. These figures include persons at all ages. Col. (c) also contains figures published by the Mines Department.

Every section of this coalmining area has been affected by the decline. The geographical divisions in the table below relate only to coalmining within the Survey Region. In that Region it has been found convenient to divide the coalmining area into five districts. District A groups together the coalmines in the northern part of the Region around Blackburn, Great Harwood, Accrington, Burnley, etc., where the mines are small and dependent upon local demand, particularly from the cotton industry. District B is a small and rapidly declining coal area around Stalybridge, Hyde, Ashton and Oldham, etc. District C includes the mining area to the west of Manchester, including Bolton, Leigh, Farnworth, Pendlebury, Atherton and Tyldesley. Here the mines are large and the demand is principally local for industrial and domestic consumption. This is the district in which Manchester Collieries Ltd. operates. District D is the largest group, containing the biggest collieries, and covering much of the territory of the Wigan Coal Corporation. District E is a newer area around St. Helens and Earlestown, which has a much greater interest in export trade than the other districts. It also contains large mines. In Table II, the movements of insured employed are shown for the years 1923, 1924, 1927, 1929, 1930. Each district shows a fall, particularly after 1924.

TABLE II.

*Insured Employed Persons in Coalmining in Certain Districts in the Survey Region.**

<i>Year.</i>		<i>District A.</i>	<i>District B.</i>	<i>District C.</i>	<i>District D.</i>	<i>District E.</i>
1923	...	6,905	3,196	29,079	47,984	11,881
1924	...	6,868	3,323	28,663	45,321	11,589
1927	...	6,590	2,712	22,804	32,880	9,375
1929	...	5,493	2,196	19,814	26,817	8,411
1930	...	4,163	1,634	19,425	26,788	8,131

II.—Unemployment.

(a) *The Surplus Labour.*

The unemployment in the coalmining industry has been severe in the past five years but much less serious than it would have been if the numbers insured had not fallen from 119,000 in 1924 to 91,000 in 1930. Despite this reduction, however, the rate of unemployment between 1928 and 1930 ranged around 25 per cent., representing 20,000-25,000 workers not able to find employment. The details are shown in Table III.

* Insured Employed obtained by deducting from estimated insured persons quarterly average of persons unemployed. For 1923 unemployment figures available for the last three quarters only.

TABLE III.

*Estimated Numbers Insured and Average Numbers and Percentage Unemployed in Coalmining.**

Lancashire and Cheshire.

<i>Year.</i>		<i>Numbers Insured.</i>	<i>Average No. Unemployed.</i>	<i>Percentage Unemployed.</i>
1923	... ..	117,260	5,303	4.5
1924	... ..	119,310	6,194	5.2
1925	... ..	112,280	19,242	17.1
1927	... ..	104,940	19,597	18.7
1928	... ..	96,800	25,459	26.3
1929	... ..	89,870	21,674	24.1
1930	... ..	90,900	23,643	26.0
1931	... ..	88,200	26,237	29.7

* See notes to Table I.

In an industry such as this, in which unemployment has fluctuated so widely, any estimate of surplus labour must be hazardous but, to judge from conditions between 1928 and 1931, the surplus cannot well have been less than about 20,000 insured workers in Lancashire and Cheshire. When it is remembered, in addition, that the figures of insured persons do not include those below 16 years of age, this estimate might even be on the low side. It is apparent, therefore, that the withdrawal of labour from the industry has not yet been on a sufficient scale to equalize the demand for and the supply of labour.†

There is, unfortunately, no information in regard to the Survey Region or Lancashire and Cheshire, of the movements which have led to the decline in the numbers insured. Details are available, however, for the whole of the North-Western Division of the number of entrants into and the "wastage" from insurance. This Division, of course, includes, in addition to the Lancashire and Cheshire coalfield, the coalmining areas in Cumberland and Westmorland which show peculiar features which might affect the validity of any conclusions drawn for Lancashire and Cheshire from the statistics for the Division.‡ If, however, the statistics of the North-Western Division do represent the true trends in Lancashire, then Table IV shows that there has been a constant decline in the numbers entering the industry down to 1929 with the wastage gaining a steadily greater superiority over the entrants.§ Whilst this is satisfactory, the actual movement of miners, under

† How far the years 1928-30 can be regarded as normal is dealt with below, p. 168 et seq.

‡ According to the Annual Report of the Secretary for Mines in 1929 the number employed in coalmines in Cumberland and Westmorland was 9,776 as against 79,233 in Lancashire and Cheshire.

§ This decline in the number of new entrants does not appear to have been due, to any great extent, to the legislation which now controls certain forms of entry into the industry.

the Industrial Transference Scheme, from Depressed Mining Areas in Lancashire has been attended by many difficulties. Table V shows that of 2,149 men directly transferred from five Employment Exchange areas in Lancashire, between January, 1929 and June, 1930, 1,300 returned home.*

TABLE IV.

New Entrants into and Wastage from Coalmining. North-Western Division.

Year.	New Entrants.		Wastage.
	Men.	Boys.	Males.
1923-24 ...	2,279	3,209	10,578
1924-25 ...	1,628	3,209	5,847
1925-26 ...	810	2,435	5,945
1926-27 ...	357	1,923	10,970
1927-28 ...	271	1,800	7,311
1928-29 ...	86	1,610	9,376
1929-30 ...	97	1,777	1,194

TABLE V.

Direct Transfers of Men from Five Employment Exchanges in the Lancashire Coalmining Area. January, 1929, to March, 1930.

	<i>Single.</i>	<i>Married.</i>	<i>Total.</i>
Number Transferred	1,668	481	2,149
Numbers Remaining in New Areas ...	732	117	849
Numbers Returned Home	936	364	1,300

(b) The Age Distribution of the Unemployed.

It has been impossible to obtain any information of value regarding the age distribution of the persons unemployed in the coalmining industry. One conclusion, however, stands out very clearly: the unemployed are almost wholly adult men.† In the mining industry about 93 per cent. of the persons employed are over 18 years of age. It follows that the great bulk of the unemployed will be among those above this age. The quarterly average number of insured juveniles (16-18 years) unemployed has never, since 1923, exceeded 500 in the Survey Region, the unemployment being

* See evidence of Mr. S. Warrington before Unemployment Insurance Commission, January 16th, 1931, p. 233.

† The proportion of women to men in the Lancashire coalmining industry is, however, much higher than in other fields.

about 14 per cent.* On the other hand, in 1930, 91 per cent. of the total unemployed in the Region in this industry were men over 18 years of age.

(c) *The Occupational Distribution of the Unemployed.*

Conclusions regarding the occupational distribution of the unemployed are conditioned by the fact that it has been possible to obtain returns only for the months July-November, 1931, so that they refer to an abnormal year and to a period when seasonal unemployment is likely to be great. Nevertheless, during this period certain interesting conclusions emerge. If use is made of the distinction between skilled and unskilled workers† in the Ministry of Labour's list of occupations for placing purposes, about 60 per cent. of the unemployed coalminers are unskilled and 40 per cent. skilled, and the unskilled outnumber the skilled both among surface and underground workers.

TABLE VI.

Percentage Distribution of Men (18 years and over) Unemployed in 27 Employment Exchange Areas in the Lancashire Coal-mining Area, 1931.

1931.	Underground Workers.		Surface Workers.		Total.
	Skilled.	Unskilled.	Skilled.	Unskilled.	
June	37·4	41·8	1·0	19·8	100·0
July	37·1	42·7	1·0	19·2	100·0
August	36·1	40·0	1·2	22·7	100·0
Sept.	39·5	38·5	0·7	21·2	100·0
Oct.	38·4	39·1	0·9	21·6	100·0
Nov.	32·0	42·2	0·7	25·0	100·0

(d) *Geographical Distribution of the Unemployed.*

The concentration of the mining industry in the southern belt of the Survey Region naturally results in the great body of the unemployed being found in the Leigh, Wigan, St. Helens district and, in 1930, about 83 per cent. were found in these contiguous areas (Table VII). From one point of view this geographical concentration of unemployment adds difficulty to industrial transference. On the other hand, since the great bulk of these unemployed persons are in the southern part of the county where industries are expanding, and since the majority of them are unskilled workers, it ought to be possible to bring some measure of relief by short distance transference into other industries.

* But see p. 111 for an explanation of the weaknesses of these statistics.

† See p. 118 for explanation.

TABLE VII.

Geographical Distribution of Insured Unemployed Persons in Coal-mining (Quarterly Average), 1930.

<i>District.</i>	<i>Numbers.</i>	<i>Percentage.</i>
A (Burnley, etc.)	1,417	7·0
B (Eastern)	946	4·7
C (Leigh, etc.)	6,165	30·6
D (Wigan, etc.)	9,012	44·6
E (St. Helens, etc.)	2,649	13·1
	20,189	100·0

III.—The Trends of the Industry.

In Section II rough estimates have been made of surplus labour upon the assumption that the years 1928-1930 were normal in the sense that they provided some indication of the scale on which the industry would operate in the future. But the choice of such a "normal period" is subject to important reservations. Certain factors appear to be operating towards a reduction of output and employment in the Lancashire coalmining area; other factors suggest that the present scale of activity might be continued.

In the first place a long distance view of the course of events in the industry suggests that it must dwindle in importance through the appearance of those conditions which are always associated with age and relative exhaustion in extractive industries:

1. The coalmining industry in Lancashire and Cheshire increased its output continuously in the last quarter of the 19th century. The peak appears to have been reached in 1907 and there has been a steady decline in tonnage raised since that year. This decline has not only been actual but relative to other coalfields in the country. If Lancashire and Cheshire output be compared either with that of those coalfields which are usually regarded as being competitive with Lancashire, or with that of the coalfields in the whole country, the share attributable to the Lancashire and Cheshire coalfield shows a substantial and continuous fall since 1875.* The presumption is, therefore, that the competitive strength of this area is growing less.

2. This conclusion is reinforced by the figures, over the same period, of annual output per person employed. These statistics, particularly in comparisons between different coalfields, are subject to error since the number of persons employed over the year is a quarterly average of numbers "on the colliery books" and no allowance is made for short time working and changes in its importance over a long period, or for differences in hours of work in different coalfields. Moreover, differences in output per person in different coalfields may be due to the varying degree to which

* See Appendix 6, Table I.

machinery is used in the several fields and a low output per head obtained with low capital charges may be more profitable than a high output obtained only by the use of costly mechanical apparatus. Nevertheless, there is some significance to be attached to the fact that whereas annual output per head in Lancashire and Cheshire was well up to the average for the whole country between 1870 and 1900, since 1900 it has fallen considerably and is now lower than in any other major coalfield in Great Britain.*

For a much shorter period, and for slightly different areas, figures are available of output per manshift. These again show the unfavourable position of Lancashire, Cheshire and North Staffs. in relation to other fields.†

3. The average costs of production, as shown by the details published by the Secretary of Mines, reveal that these costs are considerably higher in "Lancashire, Cheshire and North Staffs."‡ than in most other important coalfields. These figures of costs exclude certain items, such as loan interest and amortization charges, and therefore may show true costs at too low a level, relatively, in certain areas, such as South Yorkshire, where a large amount of capital equipment is employed per worker. Differences in costs shown in this form may also be attributable to the inclusion of different cost items in different coalfields. Some importance must, however, be attached to the widening gap that tends to appear between costs in "Lancashire, Cheshire and North Staffs." and costs in competitive fields.§

4. The Lancashire and Cheshire coalfield seems to have shared in the overproduction, resulting in sales at a loss, which has been general in the industry since 1924. For very long periods between 1925 and 1930 "Lancashire, Cheshire and North Staffs." has shown higher "costs per ton" than "proceeds per ton" and the debit balance between these two items has usually been greater than in other coalfields.|| The evidence, therefore, suggests that the scale of operation 1928-1930 is not a scale which could be indefinitely maintained.

So much, therefore, is to be set against the future of the Lancashire coalmining industry. On the other hand, there are some considerations which place its future in a much more favourable light.

1. The coal in the area is far from exhausted. Large coal areas still remain untapped¶ and favourable conditions might bring these into operation in the distant future.

* See Appendix 6, Table II.

† See Appendix 6, Table III.

‡ The relative importance of the different fields in this group is shown by the figures of tonnage of coal raised in 1930: Lancashire and Cheshire, 15,000,000 tons; N. Staffs., 5,000,000 tons.

§ See Appendix 6, Table IV.

|| See Appendix 6, Table V.

¶ The resources of the proved coalfield are estimated at about 4,000 million tons.

2. The fact that the industry supplies a local market will enable it to hold a large part of this market against the competition of other fields which would have to face heavier transport charges. Whilst the cost of production in Lancashire and Cheshire has been shown to be well above that in other fields, the pit head price is also higher.* It may be, therefore, that the possession of a degree of monopoly conferred by proximity to the market will enable this area to continue in production on a scale larger than would be suggested by the facts mentioned above.

3. It is commonly argued that all "quota" systems tend to prolong the life of weak units in industry and that, as a result of the Coal Mines Act of 1930, a coalfield such as that found in Lancashire would find its relative position improved. It does not appear, however, that, up to the third quarter of 1931, the Lancashire coalfield has improved its position in relation to other fields in the country.†

4. The structure of the industry in Lancashire and Cheshire will provide resistance to any further decline in output. Many concerns in the county have been grouped together into large amalgamations, such as the Wigan Coal Corporation and Manchester Collieries Ltd., which may be expected to bring substantial economies in production and distribution and, through the elimination of the poorer mines, to force down costs. Moreover, the fact that many coalmines in this area are bound up in vertical integration with iron and steel and other industries will help them to maintain a market. The latest development of this kind, the connection that has been created between the Wigan Coal Corporation and the Lancashire Steel Corporation, is but one of many such vertical concerns in the county which provide their own market for coal.

These then are the conflicting tendencies which must be weighed in assessing the future of Lancashire coalmining. On balance, it seems that to take the year 1929 as a "normal year" represents an optimistic outlook. An expansion of industries in Lancashire would bring a revival in demand for coal; on the other hand, the increased use of other types of fuel and electricity appears likely to reduce this demand in the future. There appears, therefore, little likelihood of output in this coalmining area increasing, in the near future, above the datum line taken.

IV.—The Relation between Labour and Output.

In the foregoing sections reasons have been given for the view, that the output of the Lancashire and Cheshire coalfield is not likely to increase, in the future, above the 1929 level. The volume of employment which will be required for this output will depend, however, upon many other factors connected with the efficiency of the industry.

* See Appendix 6, Tables VI and VII.

† See Appendix 6, Table VIII.

Figures of output per person employed in "Lancashire and Cheshire" and output per man shift in "Lancashire, Cheshire and North Staffs." have already been given* and the point made that annual average output per person has fallen steadily since 1880. Within the last five years, however, this downward movement has been checked and even reversed as is shown in Table VIII.

TABLE VIII.

Annual Average Output per Person Employed and Output per Man-shift in the Lancashire Coalmining Area, 1922-1930.

Year.	Average Annual Output per Person Employed. Lancashire and Cheshire.† Tons.	Output per Man Shift. Cwts.	
		Lancashire, Cheshire and North Staffs.	Lancashire and Cheshire.
1922 ...	169	14·61	Not available.
1923 ...	189	14·78	
1924 ...	187	14·45	
1925 ...	175	14·68	
1927 ...	189	16·46		16·69
1928 ...	185	17·06	17·02
1929 ...	198	17·62	17·42
1930 ...	198	17·59	17·32

† For reservations regarding these statistics see p. 168.

The factors at work here are numerous and their results are inextricably bound together.

1.—Changes in Hours of Work.

Changes in the length of the working day will obviously influence output per manshift. In fact, the higher level of output per manshift and per person in the period 1927-30 as compared with the period 1922-25 is due partly to the fact that the maximum length of the working day was increased from seven to eight hours after the stoppage of 1926. Previously, the length of the working day had been reduced by the Eight Hours Act, 1908, and by the Seven Hours Act of 1919. Hence the declining output per person prior to 1924 must be ascribed partly to these legislative changes. In 1931 hours were again reduced, to seven and a half a day.

2.—The Elimination of Weak Units.

The productivity of labour will be affected by the extent to which uneconomic mines have been closed down and output concentrated upon the more efficient units.

* See Appendix 6, Tables II and III. The weaknesses of these statistics, there referred to, must not be overlooked.

There is every indication that the capacity of the industry has been considerably reduced in recent years. The number of collieries at work in the coalfield has fallen from 286 in 1921 to less than 200 and many of the collieries still operating are working on a considerably smaller scale.* Hence the improvement in working results for the coalfield as a whole in recent years is undoubtedly due in part to the elimination of weaker units.

3.—*Reorganisation.*

In the past few years there has been a certain amount of reorganisation in the Lancashire coal industry which may have increased output per head and hence reduced the employment provided by any given output.

The two largest undertakings in the industry are both of recent origin. Thus Manchester Collieries, Ltd., was formed in 1928 by the amalgamation of six other companies and their subsidiaries. The Wigan Coal Corporation was established in 1930. It differs in structure very considerably from Manchester Collieries and is a subsidiary of the Lancashire Steel Corporation. In 1928 there was also an amalgamation between the Garswood Coal and Iron Co., and the Garswood Hall Collieries Co. Ltd. The amalgamated concerns took over six collieries employing 3,600 men, but many of these have since been closed down. The only other important change in the organisation of the industry has been the formation of the East Lancashire Foundry Coke Company by three concerns in the Accrington and Burnley area, which have amalgamated their coking and by-product businesses but still conduct their colliery businesses independently.

Recently, amalgamation has been encouraged by State action, which starting with relief from stamp duties, etc., in 1923, has culminated in the establishment of the Coal Mines Reorganisation Commission in 1930. This Commission has proposed, in its recent memorandum, the complete amalgamation of all collieries in the Lancashire field. Such an amalgamation was agreed to in principle by the Lancashire and Cheshire Coal Owners' Association in November, 1930, but little appears to have been done recently towards the realisation of this ideal.

At the moment, amalgamation is being advocated as the only satisfactory method of dealing with the problem of over-production and surplus capacity discussed above. This is the main argument of the recent memorandum of the Coal Mines Reorganisation Commission which declares that "we know of no sure way of bringing about the necessary concentration of output in the coal-mining industry except consolidation" and it is for this reason that the Commission advocates the complete amalgamation of all the collieries in the Lancashire and Cheshire area. No doubt a complete amalgamation could deal effectively with this problem,

* Appendix 6, Table IX.

but the amalgamations formed up to the present are not large enough to have had any notable effect in the concentration of output. Any effect which they have had upon the working results of the industry must have arisen in other ways.

Until the last few years the main arguments for amalgamation were based upon the supposed economies of large scale production. So many complications enter into the question that it is virtually incapable of statistical demonstration, but, generally speaking, under normal conditions costs of production are lower (and labour per unit output is less) if a given output is produced by a small number of large undertakings than they would be if the same output was produced by a larger number of smaller undertakings. The large undertaking has greater access to economies both in technique and in management than the small firm.

In so far as the limited reorganisation of the Lancashire coal industry since 1928 has affected working costs and employment, the economies derivable from large scale mining on the technical or productive side must be distinguished from those derivable from large scale organisation of ancillary functions or activities. On the productive side the large colliery or group may effect economies in such matters as ventilation, power supply, drainage, and the working of coal from more convenient shafts with improvements in the underground lay-out. But the possibility of such economies depends, of course, on the close proximity of the amalgamated pits. And it must also be remembered that an amalgamation of old collieries which have hitherto been developed and worked independently cannot be expected to reap all the economies which would be possible had the undertaking been worked as a unit from the outset. The results of independent and haphazard development are often permanent and cannot be remedied. Nevertheless, Manchester Collieries, Ltd.—most of the amalgamated collieries being contiguous to one another—has been able to effect a number of improvements underground which would not have been possible had the constituent companies continued operating as independent concerns. There is, however, a very definite limit to the size of technical units, and, on the productive side, even Manchester Collieries, Ltd. is divided into practically autonomous groups each under its own agent and director, and corresponding more or less with the areas worked by the companies absorbed.

On the whole, the advantages derived from amalgamation on the technical side have probably been small compared with those that have come from the organisation upon a larger scale of the distribution and sale of coal, of transport and the provision of wagons, and of the washing and grading of coal. And when coal-mining is carried on largely supplementary to other industrial activities such as the manufacture of iron and steel, or coke and by-products manufacture, then the object of amalgamation may be primarily to effect economies in these industries rather than in

TABLE XIII.

Electrical Equipment. Lancashire and Cheshire, 1921-1930.

Year.	No. of Mines at which Equipment is installed.	No. of Motors in use.	Aggregate Horse Power of Motors in use.	
			Total.	Below Ground.
1921 ...	127	—	60,557	30,801
1922 ...	122	—	64,372	32,741
1923 ...	126	—	68,398	35,485
1924 ...	128	—	72,992	37,742
1925 ...	123	1,942	77,824	39,814
1926 ...	123	2,038	80,616	40,745
1927 ...	115	2,076	83,005	41,909
1928 ...	116	2,114	83,239	41,974
1929 ...	116	2,195	87,187	43,654
1930 ...	119	2,224	89,398	43,759

In the industry during the past few years, therefore, there have been considerable technical developments which cannot have been without their effect upon the relation between labour and output. Yet even in recent years the improvement in technique, although coupled with the effects of reorganisation, does not appear to have been of sufficient magnitude to counteract the increasing natural difficulties of mining. In a recent paper read before the Royal Statistical Society, Dr. Rhodes has shown that when the effects of changes in the time worked and in the size of industry are eliminated, labour per unit output in "Lancashire, Cheshire, and North Staffs" increased not only in the period 1922-25 but also in the period 1927-30.

TABLE XIV.

Annual Percentage Changes in Working Results ("Lancashire, Cheshire, and N. Staffs").

<i>Labour per Unit of Output.</i>	<i>1922-1925.</i>	<i>1927-1930.</i>
(a) At coal-face	+ 2.0	- 0.2
(b) Elsewhere below ground	+ 0.4	+ 1.3
(c) Surface	+ 1.8	+ 1.4

Even in recent years, therefore, technical advance only retarded and did not outweigh the influence of natural and geological conditions. And in previous years its effect on these conditions must have been even less important.

6.—*Conclusion.*

It is, of course, impossible to weigh exactly the opposing tendencies which have in the past, and must in the future, influence output per head. On the one side, geological factors are tending to force down productivity; on the other, changes in the structure of the industry and the increased use of machinery are driving

it upwards. The hours of work may fluctuate in either direction. And the effect upon aggregate employment of increased technical efficiency is not direct since it is impossible to determine what increase in demand might follow any change in price that falling costs produce.

Nevertheless, there does not appear to be any great likelihood of output per head rising considerably in the immediate future. The natural factors of exhaustion which led to the decline in individual output from 1880 constitute the most powerful force in the situation.

It seems that if there is to be further unemployment in coal-mining in Lancashire and Cheshire it will be attributable rather to a declining total output than to any increase in output per head.

CHAPTER 8.

THE CLOTHING INDUSTRIES.

I.—The Clothing Industries in General.

1.—Size and Localization.

The principal clothing trades carried on in the Survey Region are Tailoring, Dressmaking and Millinery, Shirts and Underclothing, Hats and Caps, and Boots and Shoes. The following table shows, for July, 1930, the numbers insured in these trades in the Survey Region and in Great Britain and Northern Ireland.

TABLE 1.

Number of Insured Persons in the Clothing Industries of the Survey Region and Great Britain and Northern Ireland in July, 1930.

Industry.	Survey Region.			Great Britain and Northern Ireland.			Percentage of Total Survey Region to Total Great Britain and Northern Ireland.
	Males.	Females.	Total.	Males.	Females.	Total.	
Tailoring ...	7,680	17,270	24,950	68,460	133,370	201,830	12·4
Dressmaking and Millinery.	980	8,140	9,120	10,970	90,920	101,890	9·0
Hats and Caps...	5,280	6,550	11,830	13,270	21,830	35,100	33·7
Shirts and Underclothing.	1,720	16,260	17,980	8,310	76,680	84,990	21·2
Dress Industries (N.S.S.).	770	1,960	2,730	8,690	18,860	27,550	9·9
Boots and Shoes	6,060	4,220	10,280	83,270	52,570	135,840	7·6
	22,490	54,400	76,890	192,970	394,230	587,200	13·1

“ Tailoring ” includes the bespoke and wholesale manufacture of men's and boys' suits and overcoats, raincoats and waterproofs, and women's costumes. “ Shirts and Underclothing ” includes shirts, pyjamas, collars, women's underclothing, and overalls. “ Dressmaking and Millinery ” overlaps with “ Shirts and Underclothing,” for many dressmaking firms combine the making of overalls and underclothing with that of blouses and dresses in order to have an alternative when demand is slack for the main product. “ Dress Industries not separately specified ” includes such articles as corsets, gloves, umbrellas and walking sticks.

Manchester and its immediate neighbourhood is the centre of the tailoring trade. There are two big wholesale clothing firms at Wigan and one at Stockport, and most towns of any size have some clothing businesses, but the great majority of the firms making men's and boys' suits and overcoats, and women's coats and costumes, are situated in the city of Manchester itself. The manufacture of raincoats and waterproofs is carried on in the fringe of the city in Cheetham and Strangeways, and in Salford. According to the Trade Board returns the numbers of firms engaged in the different branches of Tailoring in Manchester and its immediate neighbourhood in 1930 were as follows:—*

Ready Made Tailoring	335†
Retail Bespoke Tailoring... ..	287
Wholesale Mantles	252
	<hr/>
	874
	<hr/>

The firms manufacturing shirts and underclothing, dresses, blouses, and overalls, are mainly in the centre of Manchester or in Ancoats and Ardwick. Many of the Lancashire firms have small factories and workshops making dresses, blouses and shirts, and in recent years a Manchester firm has established a big shirt factory at Altrincham, but the majority of firms engaged on these products are in Manchester. According to the Trade Board returns the numbers of firms in the Survey Region under the Dressmaking and Women's Light Clothing Trade Board and the Shirtmaking Trade Board, in 1930, were as follows:—

Dressmaking	353
Shirtmaking	118
	<hr/>
	471
	<hr/>

The manufacture of felt hats is an old established trade carried on in Stockport, Denton and Hyde. As Trade Board returns are

* Unfortunately the Trade Board Inspectorate could not supply information of the number of employees of these firms.

† Excluding waterproof firms. The making of rubberised garments is not under a Trade Board.

not available for this trade the number of firms cannot be ascertained with the accuracy of that of the above Trades, but the industry is a highly organised one and a large proportion of the firms are members of the British Felt Hat Manufacturers' Federation, which states its membership in the Survey Region in 1930 as 41. The making of headgear from materials is under a Trade Board, Manchester being the centre for the cloth-cap trade. The number of firms making caps and hats of material in 1930 is 211, the great majority of which are cap manufacturers.

The Rossendale Valley is the seat of an important shoe and slipper making industry; the 19 firms which are members of the Rossendale Valley Boot, Shoe and Slipper Manufacturers' Association employed 7,000 of the 10,000 workers in the area in 1930. These firms are situated in Bacup, Rawtenstall, Haslingden and Bury. The factories making the same class of footwear outside this district are, one at Macclesfield, one at Preston, and some small firms at Rochdale.

2.—*The Numbers Insured and Unemployed.*

So far as the labour force in the clothing industries in the Survey Region is concerned, the significant feature is the increase in total numbers of insured persons over the period 1923 to 1930. This general point heralds the possibility of what a more detailed examination proves to be true, namely, that the position of the industries as a whole is relatively satisfactory, compared with that of the other important industries in the area. The table below indicates the extent of this increase in insured persons, and shows, too, the setback occurring between 1924 and 1927.

TABLE II.

Estimated Total Insured Persons in the Clothing Industries of the Survey Region. 1923-1931.

<i>July.</i>			<i>Insured.</i>	<i>1923=100.</i>
1923	...	...	70,680	100
1924	...	...	73,310	103·7
1927	...	...	72,180	102·1
1929	...	...	75,130	106·3
1930	...	...	76,890	108·8
1931	...	...	80,500	113·9

The period 1923-30 shows a slight increase in the relative importance of female labour, which, in the earlier year, accounted for over two-thirds of the total.

TABLE III.

Percentage Sex Distribution of Insured Persons in the Clothing Industries of the Survey Region. 1923 and 1930.

<i>Year.</i>			<i>Males.</i>	<i>Females.</i>	<i>Total.</i>
1923	...	...	31·9	68·1	100
1930	...	...	29·2	70·8	100

In every branch of the clothing industries, with the exception of the Shirt and Underclothing trade, the relative importance of male labour has declined over this period. The table below indicates the movement in each of the important sections of the industry.

TABLE IV.

Percentage Sex Distribution of Insured Persons in the Clothing Industries in the Surrey Region. 1923 and 1930.

Industry.	Males.		Females.	
	1923.	1930.	1923.	1930.
Tailoring	32.4	30.8	67.6	69.2
Dressmaking and Millinery	12.8	10.7	87.2	89.3
Hats and Caps	46.6	44.6	53.4	55.4
Shirts, Collars and Underclothing	8.4	9.6	91.6	90.4
Dress Industries, N.S.S.	32.9	28.2	67.1	71.8
Boots, Shoes, Slippers	63.6	58.9	36.4	41.1

The different trades have been subject to differing fortunes since 1923. The table below shows the average percentage of insured persons unemployed for the years 1923, 1924, 1927, 1929 and 1930.

TABLE V.

Average Percentage Unemployed among Insured Persons, Surrey Region.*

	1923.	1924.	1927.	1929.	1930.	1931.
Tailoring	11.4	9.4	7.7	9.6	15.2	14.4
Dressmaking and Millinery...	8.5	8.5	6.2	8.0	11.5	12.8
Hats and Caps	11.0	10.9	4.9	8.6	15.1	20.1
Shirts, Collars and Under-clothing.	8.1	5.9	2.9	3.4	8.1	9.7
Dress Industries, N.S.S. ...	9.6	16.7	8.2	9.0	11.6	17.3
Boots, Shoes, Slippers ...	12.1	11.5	9.3	16.3	19.5	26.0

* For 1924, 27, 29, 30, quarterly average; for 1923, average for last three quarters; for 1931, average for first three quarters.

In each trade the average percentage unemployment was at its lowest in 1927. The increase in unemployment which occurred between 1927 and 1929, became much more accentuated in 1930 and 1931, but, while the position at the moment is serious, the average percentage unemployment in these trades is still well below that in many other important industries.

Looking at the figures for 1930, the last complete year, Tailoring shows an unemployment percentage more than double that of 1927. But Tailoring itself is a composite group, obscuring diverse movements within, so that any satisfactory explanation of the position must take account of these more detailed changes. The increase in unemployment in Dressmaking and Millinery is less serious. In the Hats and Caps Group two distinct trades are grouped together so that, again, the improvement in employment in 1927 and the subsequent falling away require a more detailed explanation. Shirts and Underclothing show the lowest percentage

unemployment of all sections in 1930, and in part this is due to the expansion in the shirt and men's pyjama trade. The Dress Industries (not separately specified) group is not of great importance and is made up of differing elements. The percentage unemployment rate here is not much higher in 1930 than in 1925 or 1928, and is considerably lower than in 1924. The Boot, Shoe and Slipper Group is concentrated in the Rossendale Valley so that the changes in employment for the group are a general indication of the position of the trade in that centre. Here the 1930 percentage unemployment is more than double that for 1927.

3.—*Changes in the Nature of Demand.*

The clothing manufactured in the area is mainly the medium and cheaper types, but not the cheapest. There is, of course, a considerable high-class bespoke trade carried on by the more exclusive Manchester retail shops, but, generally speaking, the bulk of the goods produced are moderately priced garments designed to meet the post-war demand of the working and lower-middle classes for light clothes.

Details will be given later of the changes in the number of insured employed persons in the various sections of the clothing industries and these are bound up with important changes in tastes and habits of consumption in recent years.

The numbers of insured employed persons in Tailoring show a marked increase between 1923 and 1931, but in actual fact this change covers a number of divergent movements. The retail bespoke trade has declined considerably, partly owing to the greater strain on middle-class incomes and partly to the development of the "ready-to-wear" trade. A few years ago all good-class merchant tailors had their own workrooms and employed a number of journeymen and apprentices making suits for customers who were measured and fitted on the premises. To quote a concrete case, six years ago a typical well-established Manchester tailor had 80 employees in the best shopping centre of the town; now he has none. This type of business is still carried on in the highest-class trade but by far the larger part of the demand for less expensive suits and overcoats is met by factory-made clothes—either bespoke or ready-to-wear. The latter type of suit is becoming increasingly popular, for the quality of ready-made clothing has improved immensely in recent years and a great range of styles and sizes is now available. Intense organisation, specialisation and continuous production have reduced the costs so that prices are tempting more customers to wear this type of clothing, with the consequence that the demand for the bespoke journeyman tailor has declined and much of the displaced labour has had to seek employment in factories.

There are a number of factories in Manchester making men's and boys' clothing, but ready-made tailoring has reached its highest development in Leeds and Bradford, and the big stores and best ready-to-wear tailors obtain their supplies from Yorkshire.

The branch of tailoring which has expanded in the Region since the War is the manufacture of rainproof and waterproof coats. Coats of this type are much in demand especially with men, as they are light in weight, useful and cheap. Indeed, the waterproof manufacturers make a fleece-lined waterproof to serve as a winter overcoat, and a big trade has been done in these in recent years. Women's waterproofs are manufactured in great variety of colours and styles so that a fashionable macintosh is almost as important as a fashionable coat. Many waterproof manufacturers also make leather and leatherette coats for women. All these clothes are within the reach of working-class incomes and have been sold in great quantities. As the insured persons employed in making these garments are included in the Ministry of Labour returns for "Tailoring" it is impossible to say what the increase in numbers employed has been, but it is highly probable that it more than offsets the decline in bespoke tailoring, and is largely responsible for the increase in the number employed in "Tailoring".

The manufacturers of shirts and pyjamas have benefited more than any other of the clothing manufacturers from the higher standard of life of the working classes. There has been a great increase in the demand for pyjamas in recent years because of a change in the normal night attire of working men.

In shirts, too, a middle-class fashion has percolated through to the working class. Tunic shirts are universally worn. Instead of the working man having two working shirts and a Sunday shirt he now possesses two or three tunic shirts in addition to his working shirts.

The change in fashion in women's underwear has not been so helpful to the Lancashire manufacturer. Formerly there was a large trade in women's cotton underwear which has almost completely disappeared. Women of all classes have adopted much simpler garments mostly made of knitted materials or artificial silk. Although these goods are being made in the Region in increasing quantities, the change of fashion has meant a serious loss of trade to many manufacturers of women's underclothing.

The demand for great variety and fashion has probably tended to shorten the seasons in the seasonal trades and to increase the risk involved in making for stock, more so as regards women's outer garments than men's. Manufacturers of women's coats, costumes, dresses, millinery, and shoes, all tell the same story; they must

know the style, colours and materials that are likely to be popular before they can produce in any quantity. This desire for fashionable clothes has increased the volume of trade, but it has undoubtedly added to the difficulties of the manufacturer.

Much of the increased expenditure of the working class on clothing has been financed by a large expansion of credit trading. Many working class, and even lower-middle class families, are buying clothes and paying for them by small weekly sums. The credit trading is carried on in various ways. The old established "Scotchman" or "Tallyman" system has become highly organised. The travelling salesman of yesterday with his pack has been largely displaced by an employee of a firm with a central warehouse, who, equipped with a motor car, calls at the houses of his customers selling goods, and collecting the weekly contributions. Each traveller has a definite round and, through the regular contact with him, his customers come to rely to an extraordinary extent on his judgment and integrity. It is, of course, the salesman's business to form an opinion as to the amount of credit which can safely be given, and to keep the buyer within that limit. It is quite usual, however, to find that the buyers have such confidence in the salesman that they do not even ask the price of the things they buy. The terms on which business is done are fixed by the National Federation of Credit Traders, and as a rule firms do not like an account to exceed £10 or the weekly contribution to be less than 2s., but a great deal is left to the discretion of the salesman. One firm with a large connection stated that its bad debts did not amount to 2 per cent. of the total, and that it had not had a County Court case for ten years.

Another method is the purchase of clothing through a clothing club. In this case the would-be purchaser applies for membership of a club, which, after assuring itself by enquiries, accepts the application. Then the member submits an estimate of the amount of credit needed, and if this is approved, the member pays a deposit, and receives a check which can be taken to certain shops on the club's list. This system has extended rapidly in recent years, and a big volume of trade is being done through the agency of these clubs.

The mail-order credit business has also developed on a big scale, and a great deal of trade is done by less orthodox methods. Many insurance agents who call for weekly contributions arrange to supply their clients with clothing and collect both contributions at the same time. Shopkeepers of all kinds who are in a position to form an estimate of the financial standing of their customers supply clothing and accept weekly payments. The system has, apparently, spread to the higher-class trade. Shops have been compelled to accept instalments owing to the decline in purchasing power of the middle class during recent years.

II.—Garments.

(a) Tailoring.

Tailoring included, in 1931, 33.7 per cent. of the total insured persons of the clothing industries in the Survey Region. As has been explained, the Ministry of Labour classification "Tailoring" includes the workers employed in the manufacture of men's and boys' suits and coats, women's and girls' coats and costumes, rain-proofs and waterproofs. The number of insured workers in Tailoring has increased from 22,400 in 1923 to 27,120 in 1931. The following table shows the character of the labour employed in certain years 1923-1931.

TABLE VI.

Insured Persons in Tailoring in the Survey Region.

<i>Year.</i>	<i>Men.</i>	<i>Women.</i>	<i>Boys.</i>	<i>Girls.</i>	<i>Total.</i>
1923	6,760	13,040	500	2,100	22,400
1924	6,750	14,880	590	2,140	24,360
1927	7,020	16,120	530	1,690	25,360
1929	7,480	15,230	610	1,830	25,150
1930	7,120	15,850	560	1,420	24,950
1931	7,640	17,400	500	1,580	27,120

Percentages.

1923	30.2	58.2	2.2	9.4	100
1924	27.7	61.1	2.4	8.8	100
1927	27.7	63.6	2.1	6.6	100
1929	29.7	60.6	2.4	7.3	100
1930	28.5	63.5	2.3	5.7	100
1931	28.2	64.2	1.8	5.8	100

In these years there has been an increase of 33.4 per cent. in the number of women and of 13.0 per cent. in the number of men insured workers. Comparing the proportions of the different types of labour in the industry in 1923 and 1930 there has been a slight decrease in the proportion of males, both adult and juvenile, a considerable decline in the proportion of girls and an increase in the proportion of women.

To some extent, changes in the administration of the Unemployment Insurance Scheme are reflected in this table and influence especially the returns relating to women, but that there has been some expansion of employment is shown in Table VII which gives the numbers of insured persons, together with the average numbers of unemployed and employed insured persons.

TABLE VII.
Tailoring. Survey Region.

Year.	Insured Persons.					Unemployed.*					Insured Employed Persons.				
	Men.	Boys.	Women.	Girls.	Total.	Men.	Boys.	Women.	Girls.	Total.	Men.	Boys.	Women.	Girls.	Total.
1923 ...	6,760	500	13,040	2,100	22,400	775	25	1,586	172	2,558	5,985	475	11,454	1,928	19,842
1924 ...	6,750	590	14,880	2,140	24,360	738	19	1,436	91	2,284	6,012	571	13,444	2,049	22,076
1927 ...	7,020	530	16,120	1,690	25,360	671	15	1,184	63	1,933	6,349	515	14,936	1,627	23,427
1929 ...	7,480	610	15,230	1,830	25,150	771	21	1,532	81	2,405	6,709	589	13,698	1,749	22,745
1930 ...	7,120	560	15,850	1,420	24,950	1,141	32	2,474	130	3,777	5,979	528	13,376	1,290	21,173
1931 ...	7,640	500	17,400	1,580	27,120	1,241	39	2,505	108	3,893	6,399	461	14,895	1,472	23,227

* Average for March, June, September and December, for 1924, 27, 29, 30; for June, September, December, for 1923; for March, June, September, for 1931.

It will be seen that the volume of employment increased until 1927, then declined slightly until 1930, and in the following year increased again to nearly the 1927 figure. The amount of unemployment in Tailoring is greater than that in any other garment industry: in 1923 the average unemployment was 11.4 per cent.; in 1927 (the most satisfactory year for the clothing industry as a whole) the average fell to 7.6 per cent; in 1930, it reached its peak of 15.1 per cent., and in 1931 there was a slight decline to 14.4 per cent.

The Tailoring industry is subject to a fluctuating demand which is, of course, reflected in employment. The busiest months are March to June, when a great deal of overtime is worked; then business slackens and from October to December a considerable proportion of the workers have to stand down. The following table shows the seasonal variations in the March, June, September and December quarters over a series of years:—

TABLE VIII.

Unemployment among Insured Persons in Tailoring in the Survey Region.

Year.	March.		June.		September.		December.	
	Actual.	Per cent.	Actual.	Per cent.	Actual.	Per cent.	Actual.	Per cent.
1923 ...	—	—	1,676	7.5	2,795	12.5	3,203	14.3
1924 ...	1,870	7.7	1,194	4.9	2,835	11.6	3,236	13.3
1927 ...	1,586	6.3	973	3.8	2,321	9.2	2,854	11.3
1929 ...	1,480	5.9	1,397	5.6	3,296	13.1	3,449	13.7
1930 ...	2,684	10.8	2,830	11.3	4,558	18.3	5,036	20.2
1931 ...	3,739	13.8	2,978	11.0	4,961	18.3	—	—

Men's suits and coats. Women's coats and costumes.

Something has already been said about the decline in the retail bespoke trade in men's suits and coats and the increase in the demand for factory-made clothes. In women's tailored clothes the change has not been so great, for it has long been customary for the majority of women to buy ready-made coats and costumes. Only a small and diminishing trade is done in bespoke garments by the most expensive shops.

It is difficult to make any statement about the average size of firms, as the range is so great; it varies from the modern factory equipped with the latest machinery to the domestic worker who receives cut-out garments from a master clothier (or even, in rush times, from a factory) and takes them home to sew, but between these there is a multitude of firms employing anything from 10 to 100 workers. The tendency is towards concentration and the larger unit, but a high degree of specialisation can be obtained in a

factory with 100 employees, so that highly efficient clothing factories are only of moderate size compared with factories in other industries, and small concerns continue to exist in large numbers because in all needle trades the fixed capital necessary is within the reach of many. A skilled worker can obtain plant on the instalment system, start manufacturing in his own home, and is enabled to build up a business because merchants are willing to support him by quick payments.

Some indication of the number of workpeople employed by firms in the Survey Area can, however, be obtained from information supplied by the Ministry of Labour regarding those firms who exchanged in bulk twenty or more unemployment insurance books. On this list there are 24 firms with over 100 workpeople who exchanged in July, 1930, 5,878 books, and 27 firms with between 50 and 100 workpeople who exchanged 1,670 cards. It is impossible to estimate what proportion these form of the total engaged in this type of tailoring, as the returns do not distinguish between the labour employed in the manufacture of different kinds of tailored garments.

The firms making the highest class bespoke suits are, of course, small in size, a few highly skilled craftsmen being employed in a workroom attached to the retail establishment. The cheaper bespoke suit, for which there is still a considerable demand, tends more and more to be supplied by the retailer measuring his customer and putting out the order to a "maker-up", or sending it to a factory as a "special".

The "maker-up", of whom there are hundreds in Manchester, usually employs a small group of workers. A big trade is done with these concerns by retail tailors in the Lancashire towns, who put out their orders directly to the "maker-up" in Manchester, or send them to a clothier who passes on the order. This system, although still extensive, is said to be dying out because of the competition of factories with their greater possibility of sectionalised work. The majority of the factories are engaged in wholesale bespoke work, executing orders sent in from numbers of retail establishments. One large factory belongs to a firm which owns a number of shops, each of which used to have its own workroom, but now the orders from all the shops are carried out at the Manchester factory. The biggest factory of this type in the area is that owned by the Co-operative Wholesale Society at Broughton, where orders from all the local Societies are executed.

In women's tailored clothes the bulk trade is in ready-made garments. There are a few big factories who sell principally to wholesale houses, and a great many small concerns who carry out orders placed with them by merchants. A merchant doing a big trade will keep going two or three of these workshops; on the other hand, some small manufacturers work for several merchants.

Rainproofs.—The manufacture of rainproofs is largely carried on by small firms. Information, regarding firms which exchanged cards in bulk, shows, in Manchester, 13 firms with over 100 employees in July, 1930 (one of these firms has extended since last year and has now over 1,000 workpeople in one factory and several hundreds in another), but there are hundreds of small firms with anything from 10 to 100 workers; moreover, there is a considerable amount of home-work. The industry is mainly in the hands of Jewish manufacturers, and it is very common for a skilled worker to obtain plant on the instalment system, purchase odd job pieces and small lines from merchant houses, and start making up rain-proof garments in his house with the aid of his family. He makes up parcels of show patterns and books orders for a very cheap type of article at small profits. Starting in this way, a man gradually extends his business and is able to employ labour and rent a work-room.

The large factories are, of course, organised on the same lines as the other tailoring factories, but the trade is in ready-made clothing. The trade is highly seasonal, the first six months of the year being the busiest, with a peak just before Easter. From June onwards business becomes slack: the production of the largest rain-coat factory in Manchester is 30 to 40 per cent. less in June-December than in January-June, varying according to weather conditions. This decline in demand is met partly by working short-time, and efforts are made to equalise output, but there is a considerable amount of unemployment in the later months of the year.

Waterproofs.—The manufacture of rubberised garments is quite distinct from the manufacture of rainproofs. There are in Manchester and district, according to the Ministry of Labour list of firms exchanging cards in bulk, only 8 firms with over 100 employees, but of these one firm has over 1,300 employees and another, a large rubber manufacturer, has 700. Apart from these, the firms are of small size.

The proportion of male to female labour in the industry is approximately one male to two females. Labour is recruited by a system of apprenticeship for five years, and in recent years technical changes have made possible the increased employment of juvenile labour. It is said that some firms are now utilising this labour for the production of certain classes of garments with the object of cutting down costs, for many of the small concerns are not members of the Rubber Manufacturers' Association, and employ non-union labour, with the result that competition between union and non-union labour is very keen. This competition has a bearing on the increased use of juvenile labour, and it is feared by some that the practice may extend and reduce the scope for the employment of adults.

Since the War there has been a change in the method of making up waterproofs. Garments were formerly smeared with solution before being machined, but quicker production is now obtained by the garment being machined right through without any solution being previously applied. The best quality of waterproofs are still made by the old method, but the demand for cheaper clothes has led to the substitution of more and more machine work for the highly skilled hand work.

The trade is definitely seasonal. There is a big demand in the spring, which reaches its peak before Whitsuntide, a steady trade for summer holidays, and a winter trade in fleece lined waterproofs. Efforts are made to spread output more evenly over the year, but the fear of fashion changes makes the problem one of great difficulty. In the quiet months of January and February manufacturers make up a stock of men's lightweight macintoshes, as there is a reasonable assurance that they will be sold, but as women's macintoshes are more susceptible to changes of taste there is a larger risk in making for stock.

(b) *Dressmaking and Millinery.*

It would have been desirable to consider the industries making women's and children's non-tailored clothing (dresses, blouses, underclothing, and baby linen) as a composite group, but owing to the industrial classification adopted by the Ministry of Labour this is not possible. Millinery is included with dressmaking and blouses, and underclothing with shirts and collars.

Dressmaking and Millinery included, in 1931, 11.5 per cent. of the insured workers in the clothing industries in the Survey Region; the total number employed was 8,091. There has been a steady decline in the numbers of insured persons since 1923. The following table shows the number of insured persons and the average number of unemployed and employed for certain years since 1923.

TABLE IX.

Dress Making and Millinery. Survey Region.

Year.	Insured Persons.					Unemployed.*					Insured Employed Persons.				
	Men.	Boys.	Women.	Girls.	Total.	Men.	Boys.	Women.	Girls.	Total.	Men.	Boys.	Women.	Girls.	Total.
1923 ...	1,700	120	10,560	1,890	14,270	69	11	977	149	1,206	1,631	109	9,583	1,741	13,064
1924 ...	990	140	9,520	2,090	12,740	74	4	933	79	1,090	916	136	8,587	2,011	11,650
1927 ...	1,020	60	8,380	1,300	10,760	71	1	560	36	668	949	59	7,820	1,264	10,092
1929 ...	970	100	7,270	960	9,300	64	2	635	41	742	906	98	6,635	919	8,558
1930 ...	920	60	6,990	1,150	9,120	107	3	893	60	1,063	813	57	6,097	1,090	8,057
1931 ...	730	50	7,290	1,210	9,280	102	4	1,016	67	1,189	628	46	6,274	1,143	8,091

* Average for March, June, September and December, for 1924, 27, 29, 30 ; for 1923, average for June, September and December ; for 1931, average for March, June and September.

One reason for this decline is the continued growth of the factory system at the expense of dressmakers and milliners who made frocks and hats on their own premises—frequently to the order of individual customers. Every small town and village supported a number of these businesses and local girls served an apprenticeship, became “improvers” and then “hands”. Factory production has overwhelming advantages over this type of business; frocks are cut out in bulk so that far less cloth is used than where a single frock is made up; the cloth is bought wholesale, or direct from a manufacturer, and the cost of converting it into a frock is a matter of a few shillings—a frock which can be made up for 1s. to 3s., according to style, could not be made by a dressmaker for less than 25s. Actually, factory-made dresses can often be sold in the shops for less than the cost of the cloth bought in the retail stores. This has brought ready-made frocks within the reach of the majority of women and has compelled numbers of local dressmakers to go out of business.

In millinery, changes in fashion have helped the factory industry. The hat built up on a buckram shape and trimmed with feathers, flowers and ribbon, has given way to a light, simple, pull-on hat. The blocked felt is manufactured in Luton, but hats made of material are being produced in increasing quantities in Manchester factories, some of the cap manufacturers having added millinery departments to their factories. Even where the hat is made entirely by hand it can be produced at far less cost under factory organisation—a hand-made hat that takes a milliner a day to make when working by herself can, when it is prepared in a factory, be sewn by her in an hour. Hence displaced milliners are being compelled to seek work in factories.

Both these trades are subject to a fluctuating demand. In normal times the busy season for the factory dressmaking trade begins about mid-September and ends soon after Whit-week. The rush is greatest during the week immediately preceding Christmas and the month preceding Whit-week. There are temporary lulls during the time when the “January Sales” are being held in the shops. A moderate trade in summer goods takes place between Whit-week and the end of July, but August to September is a very slack period.

The following table shows the seasonal variations in March, June, September, and December quarters in a series of years beginning in 1923 :—

TABLE X.

*Unemployment among Insured Persons in Dressmaking and Millinery.**Survey Region.*

Year.	March.		June.		September.		December.	
	Actual.	Per cent.	Actual.	Per cent.	Actual.	Per cent.	Actual.	Per cent.
1923 ...	—	—	910	6·4	1,352	9·5	1,355	9·5
1924 ...	846	6·6	689	5·4	1,327	10·4	1,496	11·7
1927 ...	491	4·6	413	3·8	814	7·6	965	9·0
1929 ...	445	4·8	486	5·2	965	10·4	1,070	11·5
1930 ...	852	9·3	690	7·5	1,342	14·7	1,364	14·9
1931 ...	971	10·5	797	8·6	1,798	19·4	—	—

Attempts are made to find alternative products in the slack season, but in dressmaking this is not easy as the whole of the light clothing trade tends to be slack at the same time. To keep hands together manufacturers make children's party frocks, overalls, blouses, underclothing, etc., when they can secure orders and millinery hands are employed in making silk nightdresses and handkerchief cases, tea cosies, etc., for the Christmas trade.

The transition to the factory system and trade depression have raised the level of unemployment to abnormal figures during the last two years.

(c) Shirts and Underclothing.

This branch of the clothing industry ranks second among the clothing trades in the area, including in July, 1931, 23 per cent. of the total insured persons and is another instance of rapid expansion in recent years in the clothing industry. The number of insured workers in 1923 was 9,490; in 1931 it had increased to 18,530. The following table shows the number of insured persons, together with the number of unemployed and employed in certain years since 1923 :—

TABLE XI.

Shirts, Collars, Underclothing, etc. Survey Region.

Year.	Insured Persons.					Unemployed.*					Insured Employed Persons.				
	Men.	Boys.	Women.	Girls.	Total.	Men.	Boys.	Women.	Girls.	Total.	Men.	Boys.	Women.	Girls.	Total.
1923 ...	730	70	7,430	1,260	9,490	37	4	675	54	770	693	66	6,755	1,206	8,720
1924 ...	1,240	130	8,660	2,420	12,450	32	1	619	76	728	1,208	129	8,041	2,344	11,722
1927 ...	1,120	130	10,450	1,950	13,650	69	2	269	62	402	1,051	128	10,181	1,888	13,248
1929 ...	1,620	130	12,710	2,480	16,940	76	3	449	41	569	1,544	127	12,261	2,439	16,371
1930 ...	1,420	300	13,580	2,680	17,980	112	6	1,211	125	1,454	1,308	294	12,369	2,555	16,526
1931 ...	1,400	260	13,890	2,980	18,530	151	8	1,480	156	1,795	1,249	252	12,410	2,824	16,735

* Average for March, June, September and December, for 1924, 27, 29, 30. Average for June, September and December, for 1923. Average for March, June and September, for 1931.

As will be seen the labour employed is almost entirely female. The men employed are mainly cutters using the band knife. In one of the largest and best equipped factories producing shirts, pyjamas, and women's underclothing, the labour force consisted of 9 men and 600 women.

The expansion of employment in the last few years has been largely in shirt and pyjama making and this section of the underclothing trade is now an important one, though employment in the women's section of the trade has probably suffered some contraction in the same period. Two factors have combined to create difficulties for manufacturers of this type of clothing: (a) the imposition or increase of tariffs abroad has diminished the demand for export, and (b) the change of fashion from cotton to silk and artificial silk garments has compelled them to alter their product and has brought them up against keen foreign competition.

Unemployment in this branch of the clothing trade was exceptionally low between 1923 and 1929, but in 1930 and 1931 it rose to 8.1 per cent. and 9.7 per cent. respectively. Manufacturers have attempted to meet the depression by turning out lower-quality, cheaper articles, but the decline in purchasing power has been felt by all sections of the underclothing trade.

The following table shows that there is little seasonal variation in underclothing; in normal times demand is fairly steady throughout the year.

TABLE XII.

Unemployment among Insured Persons in Blouses, Shirts, Collars and Underclothing. Survey Region.

Year.	March.		June.		September.		December.	
	Actual.	Per cent.	Actual.	Per cent.	Actual.	Per cent.	Actual.	Per cent.
1923 ...	—	—	934	9.8	660	7.0	714	7.5
1924 ...	493	4.0	433	3.5	991	8.0	993	8.0
1927 ...	417	3.1	314	2.3	392	2.9	483	3.5
1929 ...	479	2.8	363	2.1	662	3.9	771	4.6
1930 ...	912	5.1	972	5.4	1,966	10.9	1,963	10.9
1931 ...	1,419	7.7	1,434	7.7	2,530	13.7	—	—

The kind of underclothing made in the Survey Region does not vary very much with the seasons since it has become customary for men to wear cotton shirts and women knitted artificial silk or mercerised cotton underwear all the year round. The types of cotton vests made are in greater demand in the summer, but the autumn and winter trade in flannel and flannelette garments has practically disappeared.

In shirtmaking, a transition is taking place to mass production methods, which is probably causing some dislocation in the industry. A few years ago all shirts were made on the "making through" principle, that is each worker made up the complete garment; now the large factories are sectionalising the work—usually dividing the making into twelve sections—and getting a great increase of product. The firm which introduced the system stated that whereas 400 girls "making through" would turn out 1,250 shirts a day, the same number on "sectionalised" work would turn out 1,750. Sectionalised work is being introduced into the shirt factory belonging to the Co-operative Wholesale Society and a big increase in production is said to be taking place. The Trade Union officials estimate that 50 per cent. of the manufacture of shirts is now sectionalised and state that the system is spreading. As small firms do not find that it pays to adopt the system it seems probable that they will experience difficulty in meeting the competition of mass production.

In the shirt and pyjama trade change of habit has ensured a big demand in the home market. The type of shirt worn has a short life compared with that worn by the majority of men before the War, and the light colours and the materials now popular make it necessary for a man to possess a considerable number of shirts.

III.—Hats and Caps.

The manufacture of felt hats, both fur felt, and wool felt, is highly localised in Stockport, Denton, and Hyde, with a number of firms at Bury. Cloth caps, on the other hand, are produced mainly in Manchester and Salford.

Table XIII shows that the numbers of insured employed persons in the industry in the Survey Region did not change greatly between 1923 and 1930 although there was a decline in 1931. Whilst, however, the number of males declined considerably between 1927 and 1931, the number of females increased. The numbers unemployed were not large until 1930 and 1931.

TABLE XIII.

Hats and Caps (including Straw Plait). Survey Region.

Year.	Insured Persons.					Unemployed.*					Insured Employed Persons.				
	Men.	Boys.	Women.	Girls.	Total.	Men.	Boys.	Women.	Girls.	Total.	Men.	Boys.	Women.	Girls.	Total.
1923 ...	5,620	400	6,190	720	12,930	809	18	575	23	1,425	4,811	382	5,615	697	11,505
1924 ...	5,230	460	5,690	770	12,150	681	13	597	28	1,319	4,549	447	5,093	742	10,831
1927 ...	4,900	410	4,820	590	10,720	251	8	250	14	523	4,649	402	4,570	576	10,197
1929 ...	4,750	436	5,650	600	11,430	432	14	513	21	980	4,318	416	5,137	579	10,450
1930 ...	4,830	450	5,870	680	11,830	726	30	991	38	1,785	4,104	420	4,879	642	10,045
1931 ...	4,930	470	6,250	650	12,300	1,152	47	1,230	47	2,476	3,778	423	5,020	603	9,824

* Average for March, June, September and December, for 1924, 27, 29, 30; for June, September and December, for 1923; for March, June and September, for 1931.

The hat and cap industry, in common with most other branches of the clothing industry, has to meet a highly seasonal demand. Table XIV shows the degree to which trade varies as between June and September, and December and March.

TABLE XIV.

Numbers and Percentages of Insured Persons Unemployed in Hats and Caps. Surrey Region.

Year.	March.		June.		September.		December.	
	Actual.	Per cent.	Actual.	Per cent.	Actual.	Per cent.	Actual.	Per cent.
1923 ...	—	—	893	6·9	951	7·4	2,432	18·8
1924 ...	1,486	12·2	952	7·8	1,139	9·4	1,698	14·0
1927 ...	711	6·6	387	3·6	318	3·0	673	6·3
1929 ...	696	6·1	581	5·1	870	7·6	1,772	15·5
1930 ...	1,155	9·8	1,274	10·8	2,047	17·3	2,664	22·5
1931 ...	2,306	18·7	2,355	19·1	2,768	22·5	—	—

Felt Hats.

The distinction between fur felt and wool felt is important. The latter is a cheaper quality hat, and, speaking generally, a manufacturer specialises on the one or the other, though there are some firms producing high grade fur felts who are now also producing wool felts. But even within each category there is a wide range of quality.

The size of firms in the industry varies widely. There are, however, a number of firms of high repute and long standing who together employ the majority of the workers in the Region. One firm, which appears at the moment to be the largest in this area, has at present 1,050 employees.

The proportions of male and female and adult and juvenile labour for a group of firms who supplied information are as follows :—

<i>Men.</i>	<i>Boys.</i>	<i>Women.</i>	<i>Girls.</i>
699	151	693	160

In the case of one firm of considerable importance the number of juveniles employed has increased greatly over the last ten years, and only 25 per cent. of the juvenile males are apprentices. An agreement exists between the operatives' union and the manufacturers' federation, whereby the number of apprentices at any time is limited to one-fifth of the number of journeymen employed.

In the case of the firm cited above their present number of apprentices is at the maximum permitted by the agreement, and they report that "the restriction of apprentices prevents us giving opportunities to teach the trade to numbers of our boys, who consequently have to be discharged when they outgrow their junior employment. We have always more boys eligible for apprenticeship than we are permitted to put on". The general opinion expressed by manufacturers was that the present agreement did lead to a proportion of the juvenile male labour employed being unable to find adult occupation in the industry. On the other hand, in view of the present state of trade there is an abundant supply of journeymen, but should the industry experience any considerable expansion of production, then the question of the ratio of apprentices to journeymen would become an urgent problem. From information which was supplied it is possible to estimate the rate at which apprentices will complete their terms—which usually cover the period from 16 to 21 years of age. Assuming the present quota of apprentices for each manufacturer to remain the same—which is likely if short-time working continues—then the openings for new apprentices will be dependent upon the rate of turnover of those now under indenture. The position is indicated in the following table.

Percentage of existing apprentices due to complete indenture.

	Per cent.
Within one year of January 1st, 1932	18
" two years	30
" three years	13
" four years	23
" five years	16

So far as female labour is concerned the supply appears abundant, but there are two distinct classes. Some women are employed in the process of treating and hardening the hoods (i.e., the hat body before shaping) but the vast majority are engaged in trimming and finishing and packing. The latter is regarded as superior work, and for the former, girls come exclusively from the working class districts of Manchester, such as Gorton. In the industry there is no shortage of female labour, such as exists for power machinists—a reasonably comparable occupation—in other branches of clothing manufacture.

IV.—Boots, Shoes, Slippers and Clogs.

The history of this branch of the clothing industry in the Survey Region is essentially bound up in the economic development of the Rossendale Valley, where it had its beginning, and still remains highly localised. If the town of Bury be included, then a high proportion of the total production is accounted for. The remainder is to be found at Preston, Rochdale and other centres of minor

importance. The range of products embraces women's boots and shoes of medium and cheaper quality and both men's and women's slippers, all in an increasing variety of quality and style.

The circumstances which led to the foundation of the Rossendale Valley industry were recently stated as follows :—

“ The slipper trade was the direct outcome of the felt trade in Waterfoot. The felt trade was brought to Waterfoot from Leeds in 1854 and it was always a custom where felt was manufactured and printed for the warehousemen to make themselves a pair of crude slippers from the tab ends of felt to wear whilst at work. They had to walk on the felt pieces to match up the patterns and could not very well do it in their bare feet or clogs or shoes. Thus it became common for the felt workers to purchase these tab ends and to make slippers for their families and friends and even to sell them in the neighbourhood.”

“ Several families did this sort of trade. Among them were those of Mr. J. W. Rothwell and Mr. Samuel McLerie. In November, 1874, Mr. J. W. Rothwell, of Millar Barn Lane, Waterfoot, took samples of his productions to Manchester and sold six dozen slippers at nine shillings per dozen, and this was the first wholesale order for Rossendale slippers. This we might call the commencement of the slipper trade. It marked an era. Domestic retail trading became a commercial undertaking, and Mr. Rothwell engaged four young girls to assist himself and his family, and these four girls became the first employees of the slipper trade. In 1877 Mr. Samuel McLerie threw in his lot with his family who had been making slippers at home and began to supply slippers wholesale. There were various ups and downs round about 1880. There were several small ventures which did not come to much. Mr. James Gregory came in in 1879; Mr. H. W. Trickett in 1883; Mr. Hirst and Mr. Brooks in 1884 and Messrs. Hoyle, Parker & Co., in 1885.”

This was a period of depression for the cotton trade and as the slipper industry grew it made use of cotton mills which had ceased production. Even at the present time, there is no slipper factory in Rossendale which was built in its entirety for that purpose.

The development of the industry has been remarkable. The present annual production of the associated manufacturers is about 20,750,000 pairs of which approximately 25 per cent. is for export. Of recent years the export trade has declined owing to increased tariffs and to increased competition from Continental manufacturers, notably Switzerland and Czecho-Slovakia. But this loss has in some measure been compensated by securing a greater share of the home market. The industry is carried on, in the main, by limited companies of moderate size, and some twenty of these are responsible for a high percentage of the total output of the Survey Area. Most of the manufacturers are members of the

Rossendale Valley Boot, Shoe and Slipper Manufacturers' Association. The employees are very strongly organised in the Rossendale Union of Boot, Shoe and Slipper Operatives, and it is important to notice that this organisation, as also the Manufacturers' Association, is quite independent of similar organisations catering for the industry in other areas, e.g., Leicester and Northampton. To a great extent, therefore, the industry in the Rossendale Valley is a separate entity, and there is little doubt that this independence has been of considerable benefit to all concerned.

Table XV shows that, measured in terms of insured employed persons, the industry ran a fairly constant course between 1923 and 1931, although the peak of employment is to be found in 1927. The employment of women, however, shows a tendency to increase in relation to that of men. To some extent this is doubtless due to the new process of securing soles to uppers by the use of composition, in place of the normal "lasting" method, for this change involves a substitution of women for men.

TABLE XV.

Boots, Shoes, Slippers and Clogs. Survey Region.

Year.	Insured Persons.					Unemployed.*					Insured Employed Persons.				
	Men.	Boys.	Women.	Girls.	Total.	Men.	Boys.	Women.	Girls.	Total.	Men.	Boys.	Women.	Girls.	Total.
1923 ...	5,280	550	2,860	470	9,160	757	41	289	22	1,109	4,523	509	2,571	448	8,051
1924 ...	5,060	650	2,820	540	9,070	728	26	275	16	1,045	4,332	624	2,545	524	8,025
1927 ...	5,290	590	3,190	520	9,590	560	19	297	19	895	4,730	571	2,893	501	8,695
1929 ...	5,370	600	3,410	610	9,990	936	47	618	27	1,628	4,434	553	2,792	583	8,362
1930 ...	5,400	660	3,710	510	10,280	1,114	51	804	40	2,009	4,286	609	2,906	470	8,271
1931 ...	5,730	710	3,890	540	10,870	1,533	60	1,187	48	2,828	4,197	650	2,703	492	8,042

* Average for March, June, September, and December, for 1924, 27, 29, 30; for June, September, and December for 1923; for March, June and September for 1931.

The difficulty of seasonal demand constitutes a problem of considerable importance. In the boot, shoe and slipper industry, Whitsuntide, June and July are the busy periods, with a somewhat less busy period for the Christmas trade. The manufacturers in the Rossendale area have made serious efforts to distribute production more evenly, but with the recent enormous increase in variety and the tendency to a more quickly changing fashion, making for stock is a hazardous procedure. When prices are still showing a downward movement, and, as in recent months, when the cost of some raw materials has been advancing, an exceptional degree of caution has been necessary.

The table below gives some indication of the seasonal variations in unemployment.

TABLE XVI.
Boots, Shoes, Slippers and Clogs.
Unemployment among Insured Persons in the Survey Region.

Year.	March.		June.		September.		December.	
	Actual.	Per cent.	Actual.	Per cent.	Actual.	Per cent.	Actual.	Per cent.
1923 ...	—	—	727	7·9	967	10·6	1,631	17·8
1924 ...	1,172	12·9	754	8·3	870	9·6	1,381	15·2
1927 ...	1,597	16·7	601	6·3	568	5·9	811	8·5
1929 ...	1,942	19·4	1,548	15·5	1,366	13·7	1,654	16·6
1930 ...	1,697	16·5	1,299	12·6	1,651	16·1	3,385	32·9
1931 ...	2,814	25·9	3,067	28·2	2,601	23·9	—	—

The difficulty of the manufacturer in the face of this seasonal demand is a real one. To be able to give prompt delivery of a large order is important but to install plant enough to cope with what is in fact a short rush period is a prohibitive expense. Not only is the manufacturer anxious to regularise production in general, but in the case of rush periods he is confronted with exceptional pressure on particular departments of his factory. This is to say that some processes are more capable than others of responding to a demand for increased output.

Another difficulty arises in the relation between the numbers of juveniles and adults for whom employment can be provided. The processes for which juvenile labour is used constitute a relatively high proportion. It would only be possible, therefore, in a period of fairly rapid expansion to ensure transfer to an adult occupation of each juvenile attaining majority. In the present circumstances, many workers who entered the factories as boys find the greatest difficulty in securing employment on an adult process when they reach 21 years of age.

V.—The Alleged Shortage of Machinists.

I.

Early in the enquiry our attention was drawn to an alleged shortage of women power-machinists in certain branches of the clothing trade. Employers interviewed in the raincoat, mantle, dressmaking, underclothing, shirt and pyjama trades complained of difficulty in obtaining an adequate supply of skilled machinists, and apparently valued highly the efficient machinists already in their employ. With the exception of underclothing, shirts and pyjamas, these trades are seasonal, and as the manufacturers are complaining of the shortage in the off-season of a year's bad trade they are evidently convinced that this shortage is a permanent one. The question has been the subject of considerable controversy in Manchester. In April, 1931, a deputation from the Ladies' and Children's Clothing Association interviewed the Director of Education and asked that training in the use of power machines should be made available in schools for girls between the ages of 13 and 14. The suggestion was that optional classes for one or two hours a week should be provided, which, it was argued, would enable the teachers to select suitable and willing pupils and so shorten the period of training required in factories. The deputation estimated that the industry could absorb a thousand girls a year. This interview was followed by a controversy in the newspapers in which widely divergent views were expressed.

There are no means of definitely determining whether the industry needs an addition of a thousand girl power-machinists a year. Apparently, the estimate is based on a belief that, given a bigger supply of labour, the industry generally will expand more rapidly than it has done in the past few years. But, in view of the fact that the shirt, pyjama, and underclothing branch of the industry is not likely to increase at the rate it has done since 1923, this estimate seems to be a generous one.

The different interests in the industry express widely varying opinions on this question and enquiries have brought out the following points of view :—

(a) *The Experience of Employment Exchanges.*

Machinists are engaged by application at the Employment Exchanges, by advertisements in newspapers, or by personal application at the factory. It appears that manufacturers rely more on advertisements than on the Employment Exchanges, their assertion being that the Exchanges send a large percentage of unsuitable applicants, many of whom, when shown the work they are wanted for, refuse it on the ground that they are not accustomed to it.

By the courtesy of the Divisional Office we were given every facility for consulting the Employment Exchange Officers who are concerned with the placing of women clothing workers, and they

concurred with this view. They stated that they found it impossible to fill all the vacancies notified, for many women are unwilling either to try any type of machining they are not used to, or to seek work at factories any distance from their homes—even if they live in rooms they are reluctant to move to another part of the town. Appeals to them to try work on some process to which they are unused are often fruitless, for they prefer to receive unemployment benefit if possible and live at home until their own job is available again.

(b) *The Views of Employers.*

A number of employers of repute who were consulted were unanimous as to the shortage. In one dressmaking factory we were shown empty benches, a week's advertising in the newspaper having brought only three applicants. Another dressmaking firm which was about to move from the outskirts to the middle of the town gave as the reason that they were going to compete for their rivals' labour. The employers agreed that they live on each other's trainees. The custom is for the girls to be taken in as learners and receive a time rate. The legal period for learners' rates is such as allows the employer to recover some of the cost of training by keeping the girls on time rates after they have reached proficiency. What happens very frequently is that when they have acquired a certain degree of skill they leave and get employment with other firms as skilled machinists on piece rates.

A scrutiny of the many advertisements which appear in the "Machinists Wanted" column of Manchester newspapers certainly suggests considerable competition for available labour, the following being an example of the kind of appeal that is made:—

"Machinists Wanted—Manufacturers of Medium Gowns and Blouses have a limited number of vacancies for really skilled power-machinists; regular work in a happy factory under pleasant conditions is assured to the right people; these are not temporary vacancies for a rush period, as early applicants will be offered regular work."

(c) *The Views of Trade Unionists.*

On the other hand, Trade Union officials express some doubt as to the existence of a real shortage of labour and explain the large number of advertisements on the ground that when a firm has a rush order it advertises for labour in an attempt to get it from firms that are slack, and that these, in turn, advertise when they are busy, with the result that labour moves about in response to pressure of orders in different firms. They also question whether all advertisements are bona-fide. In their opinion firms advertise for labour in order to create the impression that they are busy.

On the whole the evidence would appear to bear out the contention that there is a genuine shortage of power machinists, but it is not so clear that this is true for all occupations in the clothing

industry. In fact, it would rather appear that for some occupations there is a surplus of labour, which suggests a maldistribution of labour in the industry. The following table gives information concerning the placing of women clothing workers by the Manchester Employment Exchange.

Vacancies Notified and Filled in the Period July, 1930, to July, 1931.

Month Ended.	Vacancies Notified.	Vacancies filled by local applicants.	Vacancies filled by applicants from other districts.	Total Vacancies filled.
1930.				
Aug. 5	254	169	39	208
Sept. 1	388	147	73	220
Oct. 6	426	261	80	341
Nov. 3	237	247	84	331
Dec. 1	259	146	64	210
Dec. 29... ..	294	145	82	227
Total (6 months) ...	1,858	1,115	422	1,537
1931.				
Feb. 2	582	321	113	434
March 2	619	320	169	489
April 2	626	320	165	485
May 4	486	201	164	365
June 1	272	110	78	188
July 6	407	217	116	333
Total (6 months) ...	2,992	1,489	805	2,294
Total (12 months) ...	4,850	2,604	1,227	3,831

The fact that over a period of twelve months only slightly more than half the vacancies notified could be filled by local applicants, and that a total of 10,287 applications were made for 4,850 vacancies, of which 3,831 were filled, seems to support the contention of the employers that many unsuitable applicants are sent to them, and to be an indication of maldistribution. It has to be borne in mind, firstly, that the clothing industry is in a state of transition and there must be a number of displaced workers seeking employment in processes for which they have no previous experience; secondly, that as it is easy for women to get some slight training in the sewing trades, there is a considerable fringe of inefficient labour attached to the industry; thirdly, that some of the women drawing unemployment benefit are not eager to get jobs. But even when these facts are allowed for, the returns suggest that some of the occupations are overcrowded while others are short of

labour. Unfortunately it was not possible to obtain an analysis of these returns in sufficient detail to find out where the surplus lies.

II.

On the assumption that there is a shortage of machinists the obvious questions that arise are :—(1) Why the surplus in other occupations in the clothing industry does not transfer itself to machining. (2) Why new entrants into industry are not attracted into machining.

(1) A number of factors appears to be operating to impede the rapid transfer of workers between different occupations in the clothing industry.

(a) One reason appears to lie in the Trade Board Regulations governing the rates paid to learners. These rates are determined either by age, or by experience, or by both.* If wage rates are determined by age, employers are reluctant to employ inexperienced adults, as they have to pay a woman of 21 years about 13s. a week, whereas they can start a girl of 14 years at 6s. 6d. a week. The age at which the majority of girls marry makes their working life a short one, and employers are unwilling to incur the greater expense of training an adult whom they cannot reasonably expect to retain in their employ for long. Again the experience required by the regulations does not necessarily mean experience in work which fits a girl for machining. If a girl has experience of hand sewing that experience counts in determining her wage when she commences machining, although she may be little more fitted for the work than a girl from another industry. Hence the reluctance of the employers to engage adults who have not been used to machining, and the lack of transference of surplus labour from other occupations to meet the shortage. These difficulties might be overcome if the Trade Boards concerned were willing to consider some modification of their regulations which would encourage employers to train in machining adults already experienced in other types of work.

(b) The increasing specialisation in the clothing industry is a further cause of unemployment arising out of maladjustment. If women are only skilled when working on very specialised processes they are reluctant to undertake other work because, as they point out, their earnings tend to fall within a few shillings of unemployment benefit. Still more serious is the case of the worker thrown out of employment and compelled to seek work in other branches of the sewing trades for she finds she is so specialised that

* Dressmaking and Women's Light Clothing : age only (experience in wholesale branch counts as half for retail and vice versa); Ready Made Wholesale Bespoke Tailoring and Wholesale Mantle and Costumes : age and experience; Hats, Caps and Millinery : experience only, proviso for those over 18; Shirt Making : age and experience. Retail Bespoke : experience only.

her training is of little use in the new branch. The only remedy for this is wider training, and if employers and workers would recognise the advantage of this the efficiency of the industry would be increased. The Trade Boards do lay down certain regulations about training but these are too vague to achieve much* and they relate only to learners on time rates. There are no conditions laid down by the Trade Boards as to the training to be given to girls working on piece rates, and piece rates are predominant throughout the clothing trades.† The difficulties to be overcome here are of such a character that a common policy would require an agreement between Trade Unions and Employers' Organisations, and, unfortunately, these bodies are not strong in the clothing industry. The question of training is, however, of such importance that other lines of approach, e.g., through an alteration in Trade Board Regulations or through technical training in Day or Evening Schools, merit consideration.

As it is, the employer who conscientiously tries to give a wide training is apt to meet opposition from the workers themselves. Having acquired proficiency at one process they wish to enjoy the higher earnings that are possible, and object to their transference to another process at which they earn less. If the employer insists, he is apt to lose the worker, who will seek employment with another firm at the process in which she has practice. It seems clear that unless this matter receives attention economic friction within the industry will certainly increase.

(2) A number of economic and social reasons account for the relatively slow movement of new supplies of labour into the machining occupation.

(a) All machining requires concentration and quick, adept fingers, but the amount of skill varies widely, from that necessary for simple straight seaming to that necessary for highly expert work on coats and frocks. This skill takes time to acquire and during the period of training the wages are low. The Trade Board rates in the different sections of the trade are given in Appendix 7. Actually in the industry there are great differences in practice. In cases where the demand for labour is great it is not unusual for the wages paid during the "learning" period to be above the minimum rate laid down by the Trade Board. The time that elapses between the learner reaching proficiency and being paid piece-rates is shortened. A big raincoat firm which runs a school for learners binds its apprentices for two years, starts them, at the age of 14, at 2s. above Trade Board rates, and has an arrangement by which in the last six months the apprentice is enabled to earn considerably more than Trade Board rates. The largest shirt and pyjama firm in the

* See Appendix 7 for Trade Board Regulations.

† The Tailors and Garment Makers' Union has an agreement with the Shirt Manufacturers under which a machinist must be trained in at least three of the processes in making a shirt.

area starts its learners at 10s. a week and puts them on piece rates directly they are able to earn more than 10s. a week when paid on output; but, even where the firms give better terms than are laid down by the Trade Board, some time must elapse before the learner acquires sufficient skill to earn a wage that will lessen the attraction of other occupations in which she is able to earn higher wages quickly. The following table shows the wages paid and period of training required for different occupations in a Manchester factory which manufactures knitted materials and dresses :—

Dressmaking and Knitted Goods.

	<i>Wage.</i>	<i>Period of Training.</i>
All Learners... ..	10s.	—
Experienced Knitters	35s. to 50s.	One Year.
Experienced Winders	35s. to 45s.	One Month.
Experienced Cutters	30s. to 45s.	Two Years.
Experienced Machinists	27s. 6d. to 50s.	Two Years.
Improvers	25s. to 30s.	One Month.
Pressers	27s. to 45s.	One Month.

This firm complained of a shortage of cutters as well as of machinists and a comparison of wages paid and length of training required for these occupations does suggest one explanation of the shortage, although in considering these wages it has to be borne in mind that employers hold on to their machinists and cutters to the very last in slack times, so that the risks of unemployment are less than in other occupations.

Nearly all machining, once the learners' stage is past, is paid by piece rates. Wages range between 28s. and 35s. for a normal week's work, and enquiry at factories showed a very wide range of earnings; on raincoats skilled machinists varied from 30s. to £3 a week, exceptional workers reaching £4; on dresses, the firms we consulted gave a range of wages similar to the one quoted—27s. 6d. to 50s., although £3 was the limit given by a firm making high-class garments; on shirts earnings varied from 28s. to 38s.

(b) Many of the clothing trades are, of course, seasonal, and there must be a certain amount of under-employment during the slack seasons, but unemployment is lessened by the desire of the employers to keep their machinists together. The greatest grievance of the workers, however, is that, when the demand is slack for the main product, their employers give them work on which they cannot earn their usual wage because their output is not large enough. When this happens many workers would prefer to claim unemployment benefit. It hardly seems, however, that this factor is very important since even in shirtmaking, where there are only slight seasonal fluctuations and wages are high, the shortage among machinists is also felt.

Nevertheless, if seasonal fluctuations could be reduced it would be of great advantage.* As the labour is mostly female, and many of the women marry early and leave the industry, yet stay in the same district, it would appear possible for the Employment Exchanges to set up a register of women willing to go back to work for short periods as they do in the case of seasonal Domestic. Actually firms do write and ask ex-employees to help them out when they are busy, but the Employment Exchanges could do this work far more efficiently, and an organised system would do much to make it a regular practice. Such a reserve of labour combined with some overtime would greatly lessen the danger of under-employment.

(c) The great handicap of the clothing trades as competitors for labour, however, appears to be a social one. Every one consulted insisted on the fact that machinists are regarded as of a lower social status than other workers. This prejudice is so strong that there is little social intercourse between machinists and those who consider themselves of higher social standing. It is difficult to understand why this feeling is so widespread but there is no doubt about the existence of the prejudice. One factory visited had a department for hand-made millinery that was reached by passing through a room in which girls were machining hats. The firm was about to move the hand millinery to a lower floor because the milliners objected to passing through the room in which the machinists worked. The failure of a training scheme in a Manchester suburb last year is largely attributed to this prejudice against the occupation, and, as the experiment illustrates the difficulties that are encountered in transferring labour to this work it is worth while giving its history.

In 1927 a Manchester firm consulted the Manager of an Employment Exchange in the suburbs as to whether he could provide an adequate supply of female labour if they established a shirt factory in the neighbourhood, with the result that later a factory began operations. During the next three years 400 girls were placed with this firm, after which there was difficulty in obtaining further supplies, and the firm complained that, owing to shortage of labour, work had to be sent to Ireland. As the Employment Exchange was anxious to meet this demand for labour six girls were brought from Durham through the Industrial Transference Board. This experiment proved a failure; one girl returned home immediately, and though the other five stayed three months, only two acquired sufficient skill to earn their wages. The experiment cost the firm £104 and, after three months, the girls returned home.

In the meantime the Manager of the Employment Exchange had succeeded in establishing a training scheme. He had a standing

* In this connection, the possibility might be explored of Central and Local Authorities, Railway Companies, etc., placing their orders in the slack seasons.

order for 50 girls for the shirt factory, and 200 women were drawing benefit at his exchange. Under the scheme he hoped to train unemployed women for machining. The Local Authority provided a room; a machine firm provided sewing machines and an instructress; the Unemployment Insurance Umpire agreed that women taking the training could continue receiving the benefit if they were free to be placed with any firms; the shirt manufacturing firm offered to pay any girls who entered their employment at least the amount of benefit until they could earn more.

Unemployed women up to the age of 30 were interviewed, and 60 women selected as suitable for the training expressed their willingness to enter for it. After the first batch had been trained a change was noticed in the attitude of the girls it was hoped to recruit for the scheme, and they became reluctant to take the training. Finally the scheme had to be dropped, the authorities would not run it for less than six girls, and the necessary number was not forthcoming.

In the opinion of the Manager of the Employment Exchange the excuses given by the women were not the genuine reasons for their refusal to undergo the training. He found a good deal of prejudice against work in the factory. No pressure could be brought to bear on them because the work was not their normal occupation and unemployment in the district did not last long enough to drive them into other occupations. The work offered was performed under very good conditions and the wages compared very favourably with those paid in other industries competing for female labour in the district. In many cases a woman who had taken the training and had the opportunity of returning to her previous occupation did so. It was suggested that the other factories in the neighbourhood were mainly engineering works and that women prefer the social atmosphere of factories where mixed labour is employed.

III.

The shortage of power machinists in the clothing industry is due, therefore, partly to immobility of labour within the industry itself and partly to its failure to attract new labour in competition with other industries. It becomes pertinent to enquire whether some of the difficulties which are found at the moment, whilst clothing manufacture is highly concentrated in Manchester, might be avoided if clothing firms were to establish themselves in other parts of the Survey Region. Most of the manufacturers consulted on this point declared that there were great advantages to be derived from location in Manchester where the big wholesale houses are situated. Apparently the maintaining of stocks, particularly in fashion garments, is delegated to the manufacturer, and the wholesaler wishes to be in a position to have his orders met by the manufacturer at very short notice, very often within an hour or two.

At the moment, therefore, the possibility of setting up clothing plants at some distance from Manchester, say in the north-eastern weaving towns, is greatest for those classes of clothing, e.g., shirts, in which rapid fashion changes are not important. If, however, the clothing industry did spread geographically in the Survey Region it is certain that the shortage of power machinists could be met. In towns such as Blackburn, Burnley, Nelson, Colne, etc., there is a plentiful supply of female labour with no social prejudice against factory work and with training in factory routine and the tending of machinery. Moreover, the establishment of such an industry in these weaving towns would constitute a direct attack upon the problem of unemployment where it is most serious in the Region.

CHAPTER 9.

THE CHEMICAL INDUSTRY.

The "Chemicals" group in the Ministry of Labour classification of industries is divided up into four sub-groups, viz., Chemicals Manufacture; Explosives Manufacture; Oils, Greases, Glue, Soap, Matches, etc., Manufacture; and Paints, Varnish, etc., Manufacture. The relative importance of these sub-groups in the Survey Region may be gauged from the following table.

TABLE I.

The Chemical and Allied Trades.

Average Numbers of Insured Persons employed in the Survey Region in 1929, and these numbers expressed as a percentage of total employed in Great Britain and Northern Ireland.*

<i>Sub-groups.</i>	<i>Numbers employed in Survey Region.</i>	<i>Percentage of total employed in Great Britain and Northern Ireland.</i>
Chemicals	17,080	17·2
Explosives	320	1·8
Oils, Greases, Glue, etc.	7,410	10·7
Paints, Varnish, etc.	1,530	8·4
Total	26,340	12·9

* Average for March, June, September, and December.

In this chapter the first of these sub-groups—Chemicals Manufacture—will be considered. Although the numbers employed in this industry are not large, it is worthy of separate treatment because amalgamations and technical "rationalization" have

brought about some contraction of the industry and created the possibility of a continuing surplus of male labour in certain towns in the south-west corner of the Region which are heavily dependent upon it and upon other industries which are closely associated with it.

I.—The Size and Nature of the Industry.*

In terms of insured population and of employment given, roughly one-sixth of the chemical industry of Great Britain and Northern Ireland is located in the Survey Region. It appears, then, that the Region possesses a relatively large share of the national industry.† It is wrong to assume, however, that the group of concerns found in the Region can be considered as a self-contained and homogeneous unit. For in fixing the boundaries of the Region it was inevitable that parts of South-West Lancashire and North Cheshire should be excluded, although they contain very important chemical plants which are linked structurally or otherwise with the industry within the Survey Region. The size of the industry in Lancashire and Cheshire is shown by the following estimates. According to the 1921 Census of Population, the number of persons *occupied* in the manufacture of chemicals in "Lancashire and parts of Cheshire and Derbyshire" was 23,378 (or 27.4 per cent. of the total in England and Wales). According to the 1924 Census of Production, the number *employed* in the manufacture of chemicals, dyestuffs and drugs, in "Lancashire, North Cheshire and the Glossop and New Mills Districts of Derbyshire" in 1924 was 25,985 (or 37.5 per cent. of the total in the United Kingdom), while the same region accounted for 34.9 per cent. in value of the gross output and 35.6 per cent. in value of the net output of the industry of the United Kingdom.

The chemical industry as a whole in Lancashire and Cheshire is not highly localised, but several of its branches are concentrated in relatively small areas. Among the factors contributing to this situation should be noted the extreme diversity of the products of the industry; the fact that some of its branches, which supply other industries with necessary raw materials, are located near to the markets for their products; and the need for certain chemical plants to have easy access to the source of their raw material. Thus, concerns which supply "preparation" and finishing materials to the cotton industry are usually situated in or near the principal cotton areas. The manufacture of dyestuffs and

* "Chemicals Manufacture" in the Ministry of Labour's classified list of industries is described as including tar and wood distillation and the manufacture of alkalis and heavy acids, dyes, drugs and fine chemicals, fertilisers, sheep dips and disinfectants, and acetylene, carbonic acid and other gases. This description is rather wider than that of "Chemicals, Dyestuffs and Drugs" in the 1924 Census of Production, which does not include fertilisers, sheep dips and disinfectants.

† About 60 per cent. of the chemical industry of the North-Western Division the Ministry of Labour is to be found in the Survey Region.

colours is confined mainly to the Manchester area. The alkali group of works of Imperial Chemical Industries, Limited, is situated mainly in North Cheshire around Northwich and to a minor degree in the Fleetwood district of Lancashire in order that brine may be easily obtained for use in its processes.*

Within the Survey Region the south-west corner which includes the towns of Widnes, Runcorn and Warrington is the principal district. In 1929 that part of the Region which, in addition to the above mentioned towns, includes St. Helens and Earlestown† found employment for 6,600 insured workpeople in chemicals, out of 17,080 in the whole Region. It is noteworthy, however, that over 60 per cent. of the insured employed were found outside this area. The Manchester and Trafford Park districts rank in importance next to the south-western area, but unfortunately no figures of employment are available for these districts. In other parts of the Survey Region, almost every town possesses at least one chemicals concern of substantial size.

There are at least 200 firms engaged in the production of chemicals in the Survey Region. They differ greatly in size and employment capacity, ranging from the subsidiary companies of the Imperial Chemical Industries Limited which, at their works in the Manchester, Fleetwood, Widnes, Runcorn, and Wigan districts, employ over one-quarter of the total in the Region, to small private businesses supplying strictly local industrial or domestic needs.

There are no statistics of output in the Region, nor is it possible to classify precisely the concerns according to the nature of their products or to show the relative importance of the different products. Products are highly diversified and very few firms confine themselves to a single product. Since the War, an increasing number of firms has widened the range of their products by utilising by-products or by reaching backwards to control and ensure the supply of necessary raw materials. Perhaps the main characteristic of the industry in the Region is its function as a "key" industry, whose products are utilised in manufacturing processes in other industries. Instances of such products are the heavy acids; sizes, softenings, dyestuffs and colours, and other preparation and finishing chemicals for the textile industries; colours for the leather, printing, paper, confectionery, rubber, linoleum and other trades; boiler composition and scale solvents for the heavy industries. There is, of course, a considerable degree of specialisation within the chemical and allied trades themselves; for instance, the final product of a chemical firm may be the raw

* Difficulty of access to supplies of salt seems to have been one of the factors which has led to the movement of production of heavy chemicals away from Widnes and St. Helens since the War.

† See map facing page iv.

material of a soap manufacturer or a pharmaceutical chemist. Practically all the broad categories into which the chemical industry can be divided are well represented in the Region, among them being dyestuffs and colours, alkali products, heavy chemicals including acids and chlorine and its derivatives, coal tar products (other than dyes and dyestuffs), preparation and finishing chemicals for the textile industries, tanning chemicals, manures and fertilisers, pharmaceutical chemicals, and sheep dips and disinfectants.*

Some indication of the relative importance of the main branches of chemicals manufacture in Lancashire and Cheshire is given by the 1921 Census of Population. Table II shows that in "Lancashire and parts of Cheshire and Derbyshire" in 1921, the manufacture of alkalis and heavy acids was the largest of the branches, and that in this branch and also in the manufacture of dyes, this area accounted for more than one-third of the industry in England and Wales.

TABLE II.

Census of Population, 1921.

Number of persons occupied in four branches of Chemicals Manufacture in "Lancashire and parts of Cheshire and Derbyshire," and the numbers expressed as a percentage of the totals occupied in England and Wales.

	Lancashire and parts of Cheshire and Derbyshire.			Percentage of England and Wales.		
	Males.	Females.	Total.	Males.	Females.	Total.
Alkalis and heavy acids.	9,271	393	9,664	37·0	33·8	36·9
Dyes	3,223	592	3,815	42·6	61·7	44·8
Drugs and fine chemicals.	2,202	2,193	4,395	17·9	19·2	18·5
Other chemical products.	2,945	459	3,404	27·3	19·3	25·9

There is no means of estimating for the Survey Region as a whole or for Lancashire and Cheshire the proportion which production for export bears to total production in chemicals. The relation

* The following are some of the chemicals produced in the Widnes district: heavy chemicals such as acids, caustic soda, liquid chlorine and bleaching powders, copper sulphate, ferrous oxide, zinc white, gelatine, alum and sulphate of alumina, tanning chemicals, manures and fertilisers.

between home and export trade varies considerably from one branch of the industry to another. It is probable that the relative importance of exports of dyestuffs from Lancashire has been increasing quickly in recent years, in consequence of the rapid expansion of exports of dyestuffs from the country as a whole.* There is also a very considerable export of alkali products from the Northwich district and of heavy chemicals from the Widnes and Runcorn area, but in the latter area, production for export is probably much less important than in pre-war days. On the other hand, it may be presumed that there are large sections of the Lancashire chemical industry which cater mainly for industrial and domestic consumers in the home trade. These will include the production of chemicals for the cotton, textile finishing, and other trades, and of many pharmaceutical and fine chemicals. In so far as the industry supplies the needs of exporting trades, it must be reckoned as one which is indirectly interested in the maintenance and expansion of exports.

II.—Characteristics of the Labour Force.

The outstanding feature of the labour force in the chemical industry is the preponderance of adult male workers. In the United Kingdom, roughly one in four of the persons insured are females, and little change has occurred in this proportion since 1923. In the Survey Region women workers are rarer: in 1923 there was one female to seven males, and although opportunities of occupation for females have increased since that date, yet in 1930 females constituted no more than 18 per cent. of the total insured. The small proportion of women workers is mainly accounted for by the overwhelming preponderance of males in the Widnes and Runcorn area,† where in 1923 only 5.5 per cent. of the total insured were females, and in 1930 7.2 per cent. In the last few years a substantial fall in the numbers of insured males and a small increase in the numbers of insured females in the Region have slightly raised the proportion of females. In the North-Western Division, notwithstanding a big decline in the total numbers insured since 1923, the number of girls entering insurance for the first time has tended to rise, the number of boy entrants remaining unchanged, and in the years 1928-29 and 1929-30 almost as many girls as boys entered. Moreover in the years 1926-27, 1927-28, and 1928-29, there was actually a "negative wastage" from insurance in the case of women.‡ It can be inferred from these tendencies that

* According to the Census of Production, the production of finished dyestuffs obtained from coal tar in the United Kingdom in 1924 amounted to 397,400 cwts., whereas exports totalled only 59,100 cwts. But between 1924 and 1929 exports, measured by weight, increased by 130 per cent.

† See map facing page iv.

‡ See page 79, as to the expression "negative wastage."

the sex distribution of the labour force has been changing and that the field for female employment in the industry has been slowly widening.

Direct enquiries have tended to show that such changes have been but slight, and that they are, and will continue to be, strictly limited in scope by the nature of male and female occupations in the industry. In general, the manufacturing processes are not suitable for female labour. It is customary for two or three shifts to be worked and the process work is often arduous and heavy. In some districts, during the War, women were employed in manufacture in place of men, but only after the processes had been considerably modified. Normally, however, female labour is employed in clerical occupations, the making, packing, and sealing of containers, and in canteens. The larger firms, such as the firms associated with Imperial Chemical Industries Limited, which to a great extent despatch their products in bulk, require very few women workers, whereas smaller firms and firms which prepare small packages for the retail trade are likely to need a greater proportion of women. It will be seen from Table II above that in the manufacture of drugs and fine chemicals in " Lancashire and parts of Cheshire and Derbyshire " in 1921, almost as many females as males were occupied. There is a notable tendency for females to displace males in clerical occupations.

It has been found that in towns such as Widnes, Northwich and Runcorn where chemicals is the principal manufacturing industry, nearly all the girls enter the distributive trades or take up domestic work at home or in private service.

The nature of the process work in chemicals and the three shift system also have the effect of delaying the age at which boys enter the industry from 14 years to 16 years. Consequently, in the interval between leaving school and entering chemicals, boys have to resort to blind alley occupations. It is gratifying to find that in the chemical centres close collaboration is maintained between the industry and the authorities for technical education. It has long been the policy of many firms to impose on juveniles the obligation to attend technical schools and in recompense to endeavour to ensure to the diligent boy good security of tenure of his job.

III.—Employment and Unemployment.

The numbers of insured workpeople in chemicals in the Survey Region have fluctuated greatly since 1923, but, taking into account the exclusion from insurance of persons aged 65 years or over after 1927, it is clear from the following table that the numbers attached to the industry were as high in 1929 as in any of the earlier years, for whereas the numbers of men have been falling, those of women have been rising.

TABLE III.

Number of Persons insured in the Chemical Industry at July in certain years since 1923. Survey Region.*

Year.	Males.		Females.		Total.
	Men.	Boys.	Women.	Girls.	
1923	15,750	510	2,260	420	18,940
1924	15,670	550	2,310	490	19,020
1927	13,760	500	2,420	390	17,070
1929	14,710	620	2,850	490	18,670
1930	14,170	450	2,800	420	17,840
1931	13,590	460	3,040	570	17,660

* No allowance made for exclusion of persons aged 65 years or over after 1927.

It is unfortunate that no statistics of new entrants into insurance and "wastage" from insurance relating to the Survey Region are available to explain the trends in the numbers insured, because the corresponding statistics for Chemicals in the North-Western Division are practically valueless in studying conditions in the Region.† Interesting points disclosed by Table III are that the numbers of boys and girls (aged 16-18 years) are very small in relation to the total insured, and that there are almost as many girls as boys insured.

The statistics of employment in the Region are rather more conclusive than those of insured workpeople. They show a marked degree of fluctuation, but it is evident that the volume of employment available was rather higher in 1929 than in 1924, the best of the earlier years, and that a big improvement took place between 1927 and 1929, but that there was a serious decline in 1930 and 1931. Bearing in mind the upward trend prior to 1930, 16,500 would appear to be a conservative estimate of the employment capacity of the industry.

† The reason is that in the North-Western Division, the insured population in chemicals fell from 33,450 in 1923 to 30,000 in 1929, and 29,260 in 1930. On further investigation it is found that in every year since 1923-24, excepting 1927-28, the rate of "wastage" from insurance was much higher than the rate of entry, men having left the industry in the Division in large numbers.

TABLE IV.

Average numbers of insured males and females employed in the Chemical Industry in certain years since 1923. Survey Region.*

			<i>Males.</i>	<i>Females.</i>	<i>Total.</i>
1923	...	...	13,922	2,462	16,384
1924	...	...	14,493	2,549	17,042
1927	...	...	13,077	2,673	15,750
1929	...	...	13,907	3,172	17,079
1930	...	...	11,975	2,872	14,847
1931	...	...	10,885	3,199	14,084

* No allowance made for the exclusion of persons aged 65 years or over after 1927.

It must be remembered that movements in employment have probably differed greatly from one section of the industry to another. This is evident, for instance, from the numbers of unemployment books exchanged in bulk by certain works of Imperial Chemical Industries Limited, in the Widnes, Runcorn, Manchester, Fleetwood and Wigan districts.

		<i>Widnes.</i>	<i>Runcorn.</i>	<i>Manchester.</i>	<i>Fleetwood.</i>	<i>Wigan.</i>
1925	...	2,565	55	833	1,599	†
1926	...	2,054	58	808	†	†
1927	...	2,658	113	1,041	1,362	†
1928	...	2,323	165	†	1,342	92
1929	...	2,298	132	1,251	1,374	†
1930	...	1,956	158	1,305	887	86
1931	...	1,412	†	†	†	†

† Figures not available.

The expansion of employment in the dyestuffs section of the industry (of which the Imperial Chemicals works in Manchester is one of the principal units) since 1925, and continued even in the last two years, is not typical of the industry as a whole. The Imperial Chemical Industries have been steadily increasing the numbers employed at their dyeworks in Manchester and Ellesmere Port, although, early in 1928, their works at Clayton, Manchester, were closed down.‡

Before the statistics of unemployment are given, one factor bearing on the question of their reliability should be noted. This is the incidence of seasonal working in some parts of the industry, particularly in the manufacture of fertilisers and copper sulphate in the Widnes district. It has always been possible to mitigate the worst effects of this practice by the dovetailing of occupations in the same works or in a number of works in the same district, but where dovetailing is imperfect, many workers are idle for a number of weeks in the year. In Widnes, the number of books lodged fluctuates widely from month to month, and the

‡ At Ellesmere Port (which is outside the Survey Region in Cheshire), despite a slight decline at the end of 1929, the numbers employed in December, 1929, were 130 per cent. higher than those in January, 1927.

trend of the fluctuations may vary from one year to another. It seems to follow that statistics of unemployment such as are used in this chapter based upon an average of books lodged on four days in each year cannot be completely relied upon to provide a true indication of the volume and course of unemployment. This important reservation must be borne in mind in using the figures of numbers unemployed and rate of unemployment shown in the following table.

TABLE V.

Average numbers of insured unemployed and percentage rate of unemployment in the Chemical Industry in certain years since 1923. Survey Region.*

Year.	Males.		Females.		Total.	
	Numbers.	Per cent.	Numbers.	Per cent.	Numbers.	Per cent.
1923 ...	2,340	14·4	220	8·2	2,560	13·5
1924 ...	1,730	10·7	250	8·9	1,980	10·4
1927 ...	1,180	8·3	140	5·0	1,320	7·7
1929 ...	1,420	9·3	170	5·1	1,590	8·5
1930 ...	2,640	18·1	350	10·9	2,990	16·8
1931 ...	3,170	22·6	410	11·4	3,580	20·3

* Average of June, Sept. and Dec. for 1923, of March, June, Sept. and Dec. for 1924, 1927, 1929, and 1930, and of March, June and Sept. for 1931. No allowance made for exclusion of persons aged 65 years or over after 1927.

It is well known that the British chemical industry was rather slow to recover from the dislocation of international and domestic trade caused by the War, but 1927, 1928 and 1929 were relatively prosperous years. Two important conclusions emerge from the above table in conjunction with the statistics for the national industry. Firstly, the rate of unemployment among insured females in the Region has fluctuated within much narrower limits than the rate among males; moreover, it has usually been no more than one-half of the rate among males. The rate among females of 5 per cent. in the relatively normal years (1927-1929) cannot be regarded as giving any cause for anxiety, and it is clear that women's occupations in chemicals are less affected than men's by the ebb and flow of business activity.†

Secondly, the course of unemployment in the Region has closely resembled that in the rest of the country, but the Region has consistently shown a rather higher rate of unemployment. The higher rate is due almost entirely to movements in the south-west of the Region which contains the principal chemicals centres of Widnes and Runcorn. In the rest of the Region the rate of unemployment has been almost the same as that in Great Britain in the years 1923-1929.

† See page 218.

It is to the Widnes and Runcorn area that attention will chiefly be directed. The following table shows that conditions in this district even in the relatively good years must cause disquiet.

TABLE VI.

*Widnes, Runcorn, etc., Area.**

Average numbers of persons insured, employed and unemployed and the percentage rate of unemployment in the Chemical Industry in certain years since 1923.†

Year.	Insured.	Insured Employed.	Insured Unemployed.	
			Numbers.	Percentages.
1923	8,010	6,540	1,470	18·4
1924	7,510	6,557	953	12·7
1927	6,580	5,977	603	9·2
1929	7,440	6,609	831	11·2
1930	7,180	5,814	1,366	19·0
1931	6,780	4,933	1,847	27·2

* Containing the Employment Exchange areas of Widnes, Runcorn, Warrington, St. Helens and Earlestown. See map on page v.

† See footnote to Table V on page 221.

In 1929, which was the best year from the point of view of employment given, the rate of unemployment was 11·2 per cent., and this area accounted for round about one-half of the total unemployment in chemicals in the Region. It should be noted, however, that its problem is essentially one of a surplus or reserve of male workers, for few females are attached to the industry and unemployment among them is negligible.

Direct investigation in this area has shown that conditions differ considerably from one chemicals centre to another. The principal concerns are connected with the Imperial Chemical Industries Limited, but in addition there are numerous smaller and independent firms which usually confine themselves to a narrow range of products. No generalization as to the trend of employment would be true of all these concerns, large and small, but broadly it may be said that the industry has been expanding slightly in Runcorn, almost stationary in Warrington, and contracting in Widnes and St. Helens.

In Runcorn, several firms have added to their plant since 1923, and a new works has been built. The Imperial Chemical Industries Limited have in the aggregate increased the volume of employment given, although, owing to the inward movement of workers, the working population in Runcorn has not felt the full extent of the

benefit of the increase. Production has been transferred from Electro Bleach & By-Products Limited of Middlewich to Runcorn, but the requisite amount of labour was also transferred. The Weston works of the I.C.I. have been closed down. On the other hand, employment in the Wigg Works has increased.*

The chemical industry in Runcorn endeavours to give regular and secure employment on a three-shift system; particularly is it reluctant to dismiss skilled labour of which there has been some shortage in the years of expanding production. There is no evidence that use is made of the Unemployment Insurance Scheme to maintain a reserve of casually employed labour. Indirectly, however, the industry tends to create one difficult labour problem. Normally a considerable volume of building and engineering labour is attached to and dependent upon the industry, because frequent changes in the processes worked are made and new plant is installed. In a district in which such changes are for a period abnormally swift and drastic, the demand for building and engineering workers may fluctuate very widely. At one time the demand may be so great that workers have to be drafted into the district from other parts of the country to engage in constructional work: later, when the work has been completed, the imported workers may be thrown on to the local unemployment registers.

The situation in Widnes is clearer than that in Runcorn. Very few even of the smaller firms have increased their employment capacity since the War, whereas the largest employer—the Imperial Chemical Industries, Ltd.—and several of the other firms of substantial size have greatly reduced their labour force.

Since the end of the War the numbers employed by the concerns in Widnes which are now part of the I.C.I. Organisation have fallen from a peak of about 3,000 to 2,300 in 1929 and 1,400 in 1931. This decline has been brought about by a combination of causes, two of which are outstanding. The first, and probably the more important, is the structural changes in the I.C.I. Organisation both inside and outside the Widnes area. Ever since the formation of the United Alkali Company about the year 1890 the number of its works in the area has been falling, and now no more than two remain. The closing of the Muspratt Works and the grouping of the remaining units have produced some redundancy of labour. Secondly, there is the effect upon the demand for labour of changes in technical processes. During the last two or three years changes of this kind have not been radical, but in the earlier years of the last decade a great part of the decline in employment was due to the adoption of new technical methods which greatly increased output per head. Simple electro-chemical pro-

* See above, p. 220, for numbers of books exchanged in bulk by the Wigg Works of the I.C.I. at Runcorn in the years 1925–1930.

cesses for the production of acids, caustic soda, bleaching powder etc., have been substituted for the old laborious and costly method such as the " Leblanc process ".

It appears that the effects of these and other influences making for redundancy have been felt in 1930 and 1931, so that the grav decline in the numbers employed in these years is not entirely to be attributed to the world depression.

Among other firms in Widnes, technological changes and declining sales are the main reasons for the fall in the demand for labour. The former cause has been operating in firms producing tannin chemicals and chemical fertilisers, the latter in firms making copper sulphate.

It has been possible to ascertain further details of the method of displacement of labour and the nature and probable size of the surplus of labour at the present time in the Widnes district. Some firms have adopted the policy of reducing their staffs by taking on fewer juveniles and dismissing with a pension employees over 60 years of age. As a result Widnes has a heavy rate of unemployment among its boys and young men, and it has been suggested that not much more than one-half of the boys leaving school can find employment in the industries of the district. Moreover, at the present time the town appears to have a surplus of labour of over 3,000 men, of whom less than 1,000 can hope to be absorbed in the existing industries on their present scale, even if they were working at full capacity. Nothing less than movement of labour out of Widnes or the development of new sources of employment in the district would seem to be capable of alleviating the labour problem which has arisen. In these circumstances it is very regrettable that the population of Widnes has grown from 38,860 to 40,608 between 1921 and 1931.*

The contraction of the chemical industry in Widnes has, of course, adversely affected the employment capacity of the building and engineering trades which are closely connected with chemicals. A small proportion of the surplus male labour—probably between one-quarter and one-third—consists of fairly highly specialised workers who have had experience of working in these associated industries or in soap manufacture (which, like chemicals, has suffered some decline in employment in the district). The remainder of the surplus is composed of semi-skilled or labouring operatives, who possess considerable versatility by reason of the varied nature of the functions undertaken by the rank and file workers in the above-mentioned industries.

* It is to be noted that in the same period the population of Runcorn fell from 18,476 to 18,158.

CHAPTER 10.
DISTRIBUTION.

The trends in the distributive trades in the Region since 1923 are perplexing and the most important conclusion to this chapter is that nothing short of a detailed and comprehensive enquiry could provide conclusive answers to some of the questions raised here. The fundamental difficulty which such an enquiry must face is the almost complete lack of information of the scale, methods and organisation of the various distributive agencies in the Region. Only three County Boroughs have information of the number of shops within their boundaries and only one of changes in the number of shops over a period. Whilst most of the large departmental and chain stores very willingly provided information and statistics, it was impossible to determine what proportion of the total trade was accounted for by them, and the work of consulting even a representative sample of smaller dealers would have been extremely great.* Practically nothing is known of the relative importance of the different channels along which the staple goods find their way into the hands of the consumers. And if a different approach is made to this question by asking what changes have taken place in the last ten years in the volume or the character of consumers' demand, which might have reacted upon distributive services, then immediately one is brought up against the almost complete ignorance which exists of the exact nature and extent of such changes.

The material which is available from the Census of 1921 is extremely valuable since the Ministry of Labour's industrial group "Distribution" bulks together every type of distribution and both wholesale and retail dealing. The 1921 Census figures show that, for "Lancashire and parts of Cheshire and Derbyshire," the most important sections of distribution were Grocery and Provision retail dealing; Wholesale Textile and Clothing; Drapery and Hosiery (retail); General Export Trading; and Departmental Stores.†

At first glance the employment position in the distributive trades in the Survey Region appears to be extremely encouraging. Since 1923 the number of insured employed has increased by more than 20 per cent. and this increase is found in all classes; men, women, boys and girls.‡ Moreover, this expansion is found in all parts of the area. Indeed the Manchester area appears to have gained least; a condition undoubtedly due to the fact that the "Distributive Trades" cover wholesale and export dealers and merchants who are extremely numerous in the city and who have

* Thus in 1930 there were about 20,000 shops in the City of Manchester, 2,000 in Wigan and 1,400 in Warrington.

† See Appendix 8, Table I.

‡ See Appendix 8, Table II.

decreased in numbers as a result of the depression in cotton. Nevertheless, in 1930, about half those employed in the Distributive Trades in the Region were still to be found in the Manchester Area.†

In addition, there appears to have been some tendency for employment among women to expand more rapidly than among men although males very greatly outnumber females.‡

From certain angles, however, the position is not so satisfactory. In the first place, this remarkable expansion in employment has gone along with a fairly high, and apparently an increasing, percentage unemployment; the insured population is increasing more rapidly than the demand for labour.§ Two factors appear to be mainly responsible for the paradoxical position that increasing employment is found along with increasing unemployment. There is normally a large amount of casual labour in the distributive trades. The weekly and seasonal busy periods often make it necessary for stores to increase their labour force temporarily. The Unemployment Insurance Scheme up to 1930, with the slackening of conditions for benefit, has naturally led much of the casual labour such as women who have left the stores on marriage but occasionally return at sale time to remain in insurance and to continue registration at the Employment Exchange. Beyond that, it is becoming a more common practice—for large stores particularly—to take on and dismiss labour for short periods much more freely than in the past. A large retail distributor knows that on certain days in the week trade will be brisk. If he can reduce his staff considerably on slack days and increase it at will then he obviously economises. But the effect probably will be that the number of insured persons associated in some degree with his concern will be increased. There seems to be, indeed, many reasons why the employer should adopt on the grounds of economy, a system which will lead to some measure of casualization among the workers. Periods when there will be a "peak" demand for labour are becoming more common as increasing competition and the increasing rapidity of changes in taste and fashion make "sales" and "special offer" weeks more frequent. And as the surplus in the labour market increases, and the efficiency of the Placing Departments of Employment Exchanges develops in meeting sudden demands of this kind, it is becoming easier to obtain supplies of labour at short notice. The increasing unemployment in Distribution up to 1930, therefore, is probably accounted for partly by the movement into insurance of more casual and seasonal workers and partly by changes in the nature of the demand for labour which is creating further casuals or semi-casuals.

A second feature of the labour problem in the distributive trade is that the labour turnover, or to put it in terms of insured persons the rate of entry and the rate of "wastage" are particularly high

* See Appendix 8, Table III.

† " " 8 " IV.

‡ See Appendix 8, Table V.

§ " " 8 " VI.

especially for females.* The explanation seems to be that in many branches of the distributive trades where women are employed, the demand is for young persons between 18 and 24 years. Older people may be kept on, but should they fall out of employment they find a difficulty in regaining work. There is then, here, both a further factor sufficient to account for a fairly high rate of unemployment in distribution, whatever the general condition of business, and an added strain upon the working of the Employment Exchanges in their administration of Unemployment Insurance and in their placing work. Where workers are being turned out of blind alley occupations into the labour market the need for mobility and a change in occupation becomes particularly important and yet, at the same time, the absence of alternative forms of employment and the presence of sporadic and casual work in distribution may be binding this labour to its original occupation.

Thirdly, complete reliance cannot be placed on the figures of insured employed persons as a measure of the *net* increase in the numbers finding occupation and a living in the distribution of goods. We have been informed in many quarters that the "family" business in various branches of retail trade is giving place to concerns with more capital employing paid assistants. If this is the case then the increase in the number of *insured* persons engaged in distribution might be partly offset by a decline in the numbers of uninsured persons in the same trades. It is not possible to ascertain the precise statistical balance between these counteracting movements but it is certain that some allowance ought to be made against the increase of insured employed persons.

Up to this point, general conclusions can be fortified by statistical information: there has been an expansion of employment in the distributive trades in the Survey Region and the expansion is substantial though perhaps less than the statistics of insured employed persons might suggest. When attention is directed, however, to the reasons for this growth generalizations become hazardous.

The population of the Survey Region increased by only about 2 per cent. in the ten years 1921-31. In that period there has rarely been less than 150,000 insured persons unemployed, about one-tenth of the total insured. In many parts of the Region, which have shown a large percentage increase in the employment of distributive workers, the unemployment rate has been even higher for long periods. In the large weaving towns the family income has been reduced by under-employment which brought with it no unemployment insurance benefit. This Region, therefore, hardly seems to be one in which more persons would be needed for the distribution of the goods and services that the community could afford to buy. With this perplexity go others. Has the increase in distributive workers been occasioned by an actual increase in the volume of goods being consumed by the persons in the Region? Or

* See Appendix 8, Table VII.

is the increased number of workers merely a sign of decreasing efficiency and unnecessary multiplicity in distribution? Has there been any change in the nature of the services rendered? Has the increase in distributive workers been accompanied by changes in the structure of distribution under which the larger firms—chain stores and departmental stores—replace the smaller? These, and similar questions, must remain unanswered whilst knowledge of the distributive occupations is so scanty. But certain observations can be made on these questions as a result of the enquiries which have been undertaken.

1. If the various distributive agencies had become less "efficient" in the sense that each person engaged in these occupations was responsible for a smaller volume of goods actually passing to the consumer, then this might explain the expansion of employment in them. This explanation would square with the marked change in the functions performed by retailers in recent years, by which the consumer is offered much better services—his goods are brought to his door by motor transport, his orders satisfied more promptly. Although statistical information is fragmentary it does not appear that there has been this kind of "inefficiency" among the larger stores. In the case of Retail Co-operative Societies in the Region, figures are available of the numbers employed, at one date in the year, and the total value of sales in each year. Deflating the total sales roughly by the Ministry of Labour's cost of living index number* the following table is obtained.

TABLE I.
*Indices of Employment, Total Sales and "Sales per Head" of
Retail Co-operative Societies. Survey Region.†*

Year.	Total Sales (Deflated).	Numbers Employed at Dec. 31st.		Sales per Head.	
		Distribution.	Distribution, Service and Production.	Distribution.	Distribution, Service and Production.
1923 ...	100	100	100	100	100
1924 ...	105.4	101.1	103.7	104.3	101.6
1925 ...	108.8	97.3	107.8	111.8	100.9
1926 ...	115.2	99.1	111.5	116.2	103.3
1927 ...	130.9	107.5	117.0	121.8	111.9
1928 ...	142.0	112.8	122.3	125.9	116.1
1929 ...	148.0	115.5	125.1	128.1	118.3
1930 ...	165.8	112.2	122.3	147.8	135.6

† The various "districts" into which Retail Co-operative Societies are grouped made it impossible to obtain an exact "fit" with the Survey Region but there is a rough coincidence.

* Excluding Rent.

Certain further inconclusive statistical evidence which seems to point in the same direction is provided by returns which were received from a questionnaire despatched to a number of large chain stores in the Region. The questionnaire asked for the number of persons in full time employment engaged in distribution in the shops and the number of shops. It is thus possible to obtain the number of employees per shop. Whilst, of course, the volume of goods which any shop could sell might vary tremendously, yet the fact that the average number of employees per shop shows no appreciable change is to be put against the view that sales per head have fallen.

TABLE II.
*Number of Employees per Shop among Nine Large Chain Stores.
1923-30. Lancashire.*

Year.	Total Number of Employees Engaged in Distribution.	Total Number of Shops.	No. of Employees per Shop.
1923	3,778	599	6.3
1924	3,943	615	6.4
1925	4,210	633	6.7
1926	4,281	654	6.5
1927	4,193	662	6.3
1928	4,315	676	6.4
1929	4,383	699	6.3
1930	4,494	713	6.3
1931	4,501	734	6.1

How far these trends would be duplicated in distribution as a whole, we have no means of determining.

2. Two factors which have undoubtedly accounted for some part of the increase in employment in distributive services are the dispersion of these services made necessary by changes in the distribution of population since the War, and the diversification of these services by the appearance of new wants. Whilst, on the one hand, large departmental stores are centralizing demand for some commodities, there are many articles which the consumer wishes to buy nearer at hand, and, for general groceries and provisions in particular, some duplication of shops has arisen in this way. Beyond that, the decentralization of population taking place in many large towns will create the need for some new shops in the developing areas without destroying the need for these shops in the old areas from which a part of the population has moved. Housing estates are a special case in point. The estates erected in Manchester since the end of the War contain many shops which constitute a net addition to the number in existence. Again, the new tastes which have become common in the past twelve years

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have demanded new distributive agencies. In the city of Manchester, between 1923 and 1931, the number of shops selling electrical fittings increased from 73 to 228; hairdressers increased from 562 to 815. A part of the increased effort being devoted to distribution, therefore, is absorbed by a movement nearer to the consumer, and by a catering for widening needs.

3. When, however, everything has been said of the increased demands which the community is making of those engaged in distribution, it appears that much of the expansion in distribution has still to be explained and no other explanation seems to offer itself than the multiplication of distributive agencies which, by increasing the overheads of distribution, may help to explain the sometimes very large margin between the price the producer receives and the price at which the final consumer obtains the product. It is difficult to believe, for instance, that the continued increase in the numbers of insured employed in distribution in the Region in the last two years is economically justifiable, for the intensification of the depression in industry during that period must have brought about a substantial decline in the volume of retail sales.

Here, as elsewhere, it would be dangerous to dogmatise, since information is so scanty. But the following points are significant. In the course of the Survey a questionnaire asking for information regarding employees in full time employment was sent to the large departmental stores and the most important "chain stores" in the county. Very complete replies were received from six large departmental stores; from two "chain stores" selling boots and shoes, one selling clothing, five selling groceries and provisions, and one selling drugs.

The total number of employees covered was about 10,000. Table III below shows the trend of employment in these large concerns since 1923. Against it is placed the movements of the total insured employed distributive workers in the Survey Region.

TABLE III.

Number of Full-Time Employees in a Group of Departmental and Chain Stores in Lancashire, and the Movement of Numbers of Insured Employed Persons in Distributive Trades in the Survey Region.

<i>Year.</i>	<i>Number of Full Time Employees in Stores.</i>	<i>Number of Insured Employed. Survey Region.</i>
1923	7,891	107,446
1924	8,330	111,955
1925	8,958	—
1926	9,641	—
1927	10,263	131,411
1928	10,772	—
1929	11,411	134,005
1930	11,587	133,982
1931	11,722	138,718

Now, a comparison of these two columns is not strictly valid since the Ministry of Labour industrial group "Distribution" covers many occupations other than retail distribution; notably wholesale dealing, merchanting and export. It must be remembered, also, that the details relating to the big stores are not complete. In particular, it was found impossible to obtain information from the large concerns engaged in the retail distribution of meat. Nevertheless, these statistics must include the great bulk of those employed in large departmental and chain stores. It is plain that the increase in numbers employed there is only a very small part of the increase in numbers employed in "Distribution". It is probable, therefore, that since 1923 there has been a very rapid growth in the number of small distributive firms, controlling one or only a few shops, and there seems to be nothing to account for this except what is here suggested: an over-expansion of these services leading to a decline in the sales of each shop and increasing competition between them.

The only other information available is that of the shops on the Register in the City of Manchester. The Shop Register, of course, includes very many small establishments, and, since it is collected rather for inspection purposes than statistical, it can perhaps lay no claims to absolute accuracy. But it shows that the number of shops in Manchester increased by nearly 800 in five years.

TABLE IV.

Number of Shops on Register in City of Manchester.

1925	19,385	1928	19,840
1926	19,468	1929	19,920
1927	19,677	1930	20,146

Summary.

The Survey Region has benefited in employment from the expansion of distribution, which has been found in the country as a whole. Every part of the Region, whether expanding or declining in population, and whether growing or shrinking industrially, shows this increased employment. But the increasing importance of that part of national effort which is devoted to this purpose, whilst it is gratifying in its result on employment, raises fundamental questions regarding its causes and its results. A community which is rapidly diversifying and expanding its wants will naturally devote a smaller proportion of its workers to actual manufacture and a larger proportion to such services as distribution. Whether an undue enlargement is taking place could be determined only by a minute survey of special localities and a study of distribution costs. So far as the Survey Region is concerned the evidence points to some such conclusion, though there is as yet no substantial evidence in support of it.

CHAPTER 11.

THE ELECTRICITY SUPPLY INDUSTRY.**Contents.**

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Introduction.

A great deal of space in this Report has been devoted to the question of electricity supply and consumption in the Survey Region because, whilst the employment provided by this industry is insignificant, the future of the many industries in the Region is intimately bound up with power supply and its cost. The terms of reference indicated two main lines of enquiry: in the first place, it was necessary to discover whether the present methods of generation, distribution and consumption were leading to the greatest possible efficiency; secondly, it was essential to determine whether, from the point of view of electricity supply, the Survey Region was keeping pace with other parts of the country. Whilst the information available was often too scanty to provide the basis for definite conclusions, the following detailed study suggests directions along which further enquiries should be carried out and indicates certain matters of general policy which merit consideration in the devising of schemes which will lead to the widest and most valuable application of electrical energy in its manifold uses.

I.—The Generation and Supply of Electricity.

(a) *Development of the Organisation of the Electricity Supply Industry.*

In the first decade of this century the electricity supply industry was slowly taking root in the Lancashire industrial area; its growth was gradual and haphazard, and continued in spite of authoritarian restrictions and the lack of co-ordinated effort on the part of the numerous supply undertakings.* The wartime demands for electric power imposed a great strain upon the existing capacity and structure of the supply industry in all industrial areas, and a number of Committees set up by the Ministry of Reconstruction between 1917 and 1919, of which the Coal Conservation Committee (1917) was specially important, examined various aspects of the industry's problems. Their recommendations inspired the enactment of the Electricity (Supply) Act, 1919, which provided for the appointment of five Electricity Commissioners and charged them with the function of "promoting, regulating and supervising the supply of electricity in Great Britain". One of the principal powers vested in the Commissioners was "provisionally" to divide up the country into a number of "electricity districts" each being determined by grouping together the areas of supply of a number of supply undertakings whose co-ordination for certain purposes might promote operating and administrative efficiency. The machinery created by this Act for establishing regional co-operation was of a purely voluntary character, but provision was made for the creation by agreement between the supply undertakings in any electricity district of a "joint electricity authority" for the purpose of improving the organisation of supply in that district.

After the War the supply industry in the Lancashire industrial area provided scope for the active co-operation of the numerous independent undertakings in matters of generation of electricity. In the year 1922-23, the Survey Region comprised the areas of supply (wholly or in part) of 41 local authority undertakings and seven company undertakings; and electricity was generated at as many as 40 stations, which differed considerably in capacity and degree of working efficiency. It was imperative that Lancashire should take full advantage of the powers given by the Electricity (Supply) Act, 1919, and it is interesting to note that in the use of those powers North-West England gave the lead to the rest of the country. Under the Act of 1919, four "electricity districts" in North-West England were "provisionally determined", viz., (a)

* The following figures represent the units of electricity sold by Manchester Corporation and Bury Corporation respectively in certain years since 1900:—

Manchester (million units):—1900, 6.4; 1905, 33.7; 1910, 71.6; 1913, 104.3; 1918, 195.6; 1920, 182.4; 1925, 257.4; 1930, 393.0.

Bury (million units):—1900, 0.2; 1905, 1.3; 1910, 3.9; 1913, 5.1; 1918, 14.5; 1920, 15.4; 1925, 18.5; 1930, 29.6.

South-East Lancashire, (b) Mid-Lancashire, (c) Mersey and West Lancashire, and (d) North Lancashire and South Cumberland. The Survey Region cut across the boundaries of those districts, but broadly speaking, comprised the most important industrial areas in the South-East Lancashire and the Mid-Lancashire districts, and included also the Warrington and Widnes area in the Mersey and West Lancashire district.

The South-East Lancashire and Mid-Lancashire districts were "finally determined" in 1923. It was decided also that the administration of each district should be entrusted to an Advisory Board instead of a Joint Electricity Authority. The distinction between an Advisory Board and a Joint Electricity Authority should be observed. The former was a consultative committee of representatives of the several supply undertakings within its district; the committee lacked executive powers, but questions of policy affecting the district as a whole could quite usefully be considered by it. The Joint Electricity Authority, on the other hand, once it was constituted by consent of the member undertakings, might wield considerable executive powers and virtually undermine the sovereignty of its constituent undertakings. The efforts of the Advisory Board of the South-East Lancashire and Mid-Lancashire districts after 1923, despite the lack of coercive powers, were attended with a fair measure of success. The South-East Lancashire Advisory Board, in particular, before its dissolution at 31st March, 1931, had built up a highly creditable system of inter-connected supply which made possible appreciable economies in stand-by plant, and had done much to reconcile the divergent interests of the several municipal and company undertakings in the district. In many directions, its achievements and experience and its schemes for future regulation have indicated the course which should be pursued by the Central Electricity Board after its dis-establishment.

The next significant stage in the progress of the electricity supply industry in Great Britain is marked by the publication of the Weir Report in March, 1926, followed soon by the passing of the Electricity (Supply) Act, 1926. This enactment made provision for the establishment of the Central Electricity Board and outlined the policy which should be followed in the preparation and execution of a giant national scheme for the generation and transmission of electrical energy. The Act charged the Electricity Commissioners with the duty of preparing and submitting to the Board schemes for certain defined Areas which *inter alia* should (a) determine what existing or new generating stations should be "selected stations" for the generation of electricity to the direction of the Board, and (b) provide for the inter-connection, by means of main transmission lines, of selected stations with one another and with the systems of authorised undertakers and with the systems of adjacent Areas, so as to effect savings in stand-by plant. It was anticipated that the process of re-organisation on such a scale would take

several years even in the most highly developed regions, and the Act of 1926 contains detailed transitional provisions which are designed to guide the industry through the trials and uncertainties of these years. When the " Grid " Scheme (as the National Power Scheme is popularly termed) comes completely into operation in any Area, the generation of electricity for public supply will be concentrated in a number of selected stations which will be operated by their owners (whether local authority or company undertakings) on behalf and to the direction of the Board. The Board will purchase the output of the selected stations and will then directly or indirectly supply in bulk the needs of the authorised supply undertakings in the Area which will retain sole control of the distribution and selling of electricity.

At the present time the industry in the Survey Region is passing through the transitional period contemplated by the Act of 1926, and it is not possible to give a detailed picture of the position now reached, but, at any rate, the structure which is now taking shape piece by piece may be described. In pursuance of section 4 of the Act of 1926, the North-West England and North Wales Electricity Scheme was prepared by the Electricity Commissioners and adopted by the Central Electricity Board in 1928. The North-West England and North Wales Area (or North-Western Area, as it is more commonly called) contains the whole of the Survey Region which is easily the largest and most completely developed industrial district in the Area.* In 1928, the North-Western Area comprised (wholly or in part) the areas of supply of 122 authorised undertakers, and the number of public generating stations in operation or contemplated in the Area was 70, whereas in 1929-30 the Survey Region comprised the whole or part of the areas of supply of 58 authorised undertakers, and the public generating stations in operation numbered 40.† The Scheme of 1928 indicates which of the generating stations in the North-Western Area shall be " selected stations " in the Board system. We find that of the 27 existing stations " selected " by the Board 23 are situated in the Survey Region, while of the two contemplated stations " selected " one is located in the Survey Region. In addition, the Scheme provides that during the carrying out of the works specified in the Scheme (for the construction of main transmission lines and the standardisation of frequency), the owners of certain specified generating stations may be required by the Board to make temporary arrangements for the generation of electricity to the direction of the Board, and for the supply of such electricity

* See, in addition to the North-West England and North Wales Electricity Scheme, 1928, certain " Supplementary Particulars " concerning the Scheme, published in 1928 by order of the Central Electricity Board.

† Portions of the areas of supply of certain of these authorised undertakers lie outside the boundaries of the Survey Region. The outstanding instances are the Lancashire Electric Power Company, the Mersey Power Company Ltd., and the Stalybridge, Hyde, Mossley and Dukinfield Tramways and Electricity Board.

to the Board. Thirty-five stations located in the North-Western Area are so specified, and of these, 27 are located in the Survey Region.*

(b) *Employment in the Electrical Supply Industry.*

The Electricity Commissioners collect each year figures as to the number of staff and workmen employed by authorised undertakers in Great Britain. Each undertaker is asked to give the " number of staff and workmen regularly and continuously employed during the year in operating and maintaining the undertaking " i.e., excluding employees engaged on capital works.†

Table I gives the number of staff and workmen employed by authorised undertakers in the Survey Region in each of the years 1922-23 to 1929-30 excluding 1923-24.‡

* See note * on page 235.

† The figures are " as rendered " by the undertakers themselves, and have not been subject to close analysis or criticism by the Commissioners. Errors may have crept in through the inclusion of workmen directly employed on capital works, but the Commissioners do not doubt the broad accuracy of the totals.

‡ For purposes of comparison, the corresponding figures for all authorised undertakers in Great Britain are given in Appendix 9A, Table I on page 349.

TABLE I.

Number of Staff and Workmen employed by Authorised Undertakers in the Survey Region.

Year.	Number of Authorised Undertakers.		Local Authorities.				Companies.				All Authorised Undertakers.			
	Local Authorities.	Companies.	Generation.	Distribution.	Administration.	Total.	Generation.	Distribution.	Administration.	Total.	Generation.	Distribution.	Administration.	Total.
1922-23	38	6	1,812	1,810	493	4,115	285	162	70	517	2,097	1,972	563	4,632
1924-25	45	6	1,917	1,907	590	4,414	283	174	87	544	2,200	2,081	677	4,958
1925-26	48	6	1,956	2,112	631	4,699	311	194	95	600	2,267	2,306	726	5,299
1926-27	50	6	1,932	2,481	643	5,056	327	222	94	643	2,259	2,703	737	5,699
1927-28	51	6	1,949	2,703	688	5,340	350	255	108	713	2,299	2,958	796	6,053
1928-29	52	5	1,879	3,230	726	5,835	325	274	106	705	2,204	3,504	832	6,540
1929-30	51	5	1,945	3,391	782	6,118	357	291	108	756	2,302	3,682	890	6,874

The figures for the Survey Region, like those for Great Britain, show that the increase in the number of persons employed in generation has only been slight, whereas there has been a continuous and rapid growth in the numbers employed in distribution, and a growth as persistent, though less rapid, in the numbers engaged in administration. In 1922-23, of the total of 4,632 persons employed by authorised undertakers in the Survey Region, generation accounted for 45.3 per cent., distribution for 42.5 per cent. and administration for 12.2 per cent., whereas in 1929-30, with a total of 6,874 persons, the percentages had changed to 33.5 per cent., 53.6 per cent., and 12.9 per cent. respectively.

In the year 1929-30, of the total of 6,874 persons employed by all authorised undertakers in the Survey Region, 6,118 or 89 per cent. of the total were employed by local authorities and only 756 or 11 per cent. by companies. Table I does not reveal any appreciable relative changes between 1922-23 and 1929-30 in the positions of local authority undertakers and company undertakers. The absolute changes denoted by the totals are reflected fairly evenly by the figures for local authorities and companies alike. The table also shows that while the electricity supply industry has made a useful contribution to the absorption of surplus labour in the Survey Region, the industry still remains, in terms of employment given, of relatively minor importance, its real significance being due rather to the social and economic consequences of applying electric energy to the needs of industry and of the household.

(c) Output of Electricity by Public Generating Stations.

Table II shows, in respect of (a) Great Britain as a whole, and (b) the Survey Region, the number of public generating stations being operated by authorised undertakers distinguishing those owned by local authority undertakers and those owned by company undertakers, and the total capacity in kilowatts of the generating plant installed in those stations, at the end of each year since 1922-23 (excluding 1923-24).

It appears from Table II that about one-sixth of the generating plant installed in public generating stations in Great Britain is found in the Survey Region. It will be seen also that the Survey Region reflects faithfully the growth which has been taking place in Great Britain as a whole in the number of public generating stations in operation and in the capacity of generating plant installed therein. The increase in the number of stations is but slight, but the aggregate capacity of generating plant installed has more than doubled since 1922-23. This denotes that the average capacity of plant installed per station has roughly doubled. The cardinal feature which distinguishes the Survey Region from the country as a whole in this connection is that the average capacity of plant installed per station has since 1922-23 been roughly twice as great in the Survey Region as in Great Britain. It follows that in the Survey Region, with its compact geographical configuration and

TABLE II.

At end of Year.	Number of Public Generating Stations.			Aggregate Capacity of Generating Plant Installed.	
	Local Authorities.	Companies.	Total.	Aggregate in '000 Kw.	Index numbers of capacity. 1922-23=100.
A. Great Britain—					
1922-23 ...	277	196	473	3,094	100
1923-24 ...	—	—	—	—	—
1924-25 ...	281	213	494	3,724	120
1925-26 ...	277	214	491	4,422	143
1926-27 ...	272	210	482	4,682	151
1927-28 ...	267	223	490	5,258	170
1928-29 ...	262	223	485	5,802	188
1929-30 ...	259	241	500	6,600	213
B. Survey Region—					
1922-23 ...	31	7	38	475	100
1923-24 ...	34	7	41	—	—
1924-25 ...	34	7	41	666	140
1925-26 ...	32	7	39	746	157
1926-27 ...	33	7	40	800	168
1927-28 ...	33	8	41	851	179
1928-29 ...	32	7	39	913	192
1929-30 ...	32	8	40	1,042	219

Source:—Annual Return of Engineering and Financial Statistics. Electricity Commission.

high rate of consumption of electricity per unit of territory and its progressive policy of co-ordination of undertakings, the process of concentrating the generation of electricity in larger power stations has been carried much further than in the country as a whole. But there is no doubt that this process has not yet gone far enough, for the various stations in operation in the Survey Region still display considerable differences in the capacity of plant installed therein (even neglecting such plant as is retained for stand-by purposes only).

The North-Western Area Scheme makes provision for such a degree of concentration of generation as will greatly increase the average capacity of generating plant installed per station up to the year 1940-41.* In the Area as a whole, the contemplated capacity of plant installed up to 1940-41 will be 1,991,125 Kw., which will involve a *net* addition of 763,151 Kw. to the capacity of the plant installed or sanctioned up to 1928. It is intended that in 1940-41 this plant shall be installed in 32 stations (certain of these being stations which will be working under temporary arrangements with

* See the North-West England and North Wales Electricity Scheme, 1928, and "Supplementary Particulars" relating thereto.

the Board during the carrying out of the Scheme). This will give an average capacity per station of 62,200 Kw., whereas the average capacity per station in the Survey Region in 1929-30 was 26,000 Kw.

Table III sets out for purposes of comparison the total number of units of electricity generated by all authorised undertakers in Great Britain and in the Survey Region respectively, in each of the years 1920-21 to 1929-30.

TABLE III.

Year. Col. 1.	Great Britain.		The Survey Region.	
	Units generated. Millions. Col. 2.	Index numbers of units generated. (1920-21=100). Col. 3.*	Units generated. Millions. Col. 4.	Index numbers of units generated. (1920-21=100). Col. 5.*
1920-21 ...	4,275	100·0	659	100·0
1921-22 ...	3,890	91·0	603	91·5
1922-23 ...	4,541	106·2	764	115·9
1923-24 ...	5,289	123·7	898	136·3
1924-25 ...	6,022	140·9	1,030	156·3
1925-26 ...	6,619	154·8	1,152	174·8
1926-27 ...	6,992	163·6	1,192	180·9
1927-28 ...	8,451	197·7	1,365	207·1
1928-29 ...	9,324	218·1	1,460	221·5
1929-30 ...	10,401	243·3	1,570	238·2

Source:—Annual Return of Engineering and Financial Statistics. Electricity Commission.

* The figures in columns (3) and (5) represent indices of the growth of the respective totals, based on 1920-21=100. It should be noted that the totals do not include units purchased in bulk by authorised undertakers from other authorised undertakers or from outside sources.

This table shows that the trend of development of output has followed practically the same course in the Survey Region as in Great Britain. In both areas, the load increased by about 140 per cent. between 1920-21 and 1929-30 despite a serious setback in 1921-22 and a slight check in 1926-27, the forces making for a steady upward secular trend having on the whole succeeded in neutralising the effects of the post-war depression in certain industries and the short-lived fluctuations in business activity which were a marked feature of the last decade.

A comparison of the figures for the two areas reveals that the total units generated in the Survey Region constituted about 15 per cent. of the total units generated in Great Britain in each of the years 1920-21 and 1929-30, but that some of the intervening years showed a higher percentage, e.g., 17 per cent. in 1923-24, 1924-25, 1925-26 and 1926-27. Another aspect of the same conclusion is that, after 1921-22, the rate of growth of out-

put in the Survey Region outpaced that in the country as a whole, but that this spurt was short-lived, since the ground gained was actually lost between 1926-27 and 1929-30. At the end of the decade, then, about the same percentage increase over the 1920-21 level had been achieved in the two areas. Later, an attempt will be made to explain this relative trend by analysing the sales of electricity in the two areas.*

(d) *Sales of Electricity by Authorised Undertakers.*

Table IV gives comparable figures for Great Britain and the Survey Region respectively of total *net* sales of electricity to consumers by authorised undertakers in each of the years 1920-21 to 1929-30, analysed into totals of units sold for (a) lighting and domestic purposes, (b) public lighting, (c) traction, and (d) power. Bulk supplies given to other authorised undertakers are not included in total sales to consumers. Lighting and domestic supplies include supplies for commercial lighting and heating as well as supplies to domestic consumers. Public lighting denotes lighting of public thoroughfares. Electric omnibus and tramway undertakings are the principal users for traction purposes.

TABLE IV.
Sales of Electricity to Consumers (in Million Units).

Year.	Lighting and Domestic Sales.		Public Lighting Sales.		Traction Sales.		Power Sales.		Total Sales to Consumers.	
	Great Britain.	Survey Region.	Great Britain.	Survey Region.	Great Britain.	Survey Region.	Great Britain.	Survey Region.	Great Britain.	Survey Region.
1920-21 ...	582	57	49	3	377	89	2,499	409	3,512*	557
1921-22 ...	607	60	51	4	359	88	2,105	356	3,122	508
1922-23 ...	711	72	60	5	386	92	2,548	454	3,762†	624
1923-24 ...	892	89	70	7	417	97	3,089	538	4,468	731
1924-25 ...	1,038	103	81	9	447	102	3,532	623	5,097	837
1925-26 ...	1,244	127	90	11	512	108	3,760	689	5,606	934
1926-27 ...	1,443	152	96	12	561	107	3,767	694	5,868	965
1927-28 ...	1,708	181	114	16	644	117	4,538	800	7,004	1,113
1928-29 ...	2,036	213	128	18	710	117	4,927	844	7,800	1,192
1929-30 ...	2,344	235	144	19	770	117	5,408	904	8,666	1,276

Source :—Annual Return of Engineering and Financial Statistics. Electricity Commission.

* This figure includes a "miscellaneous" item of 5.6 million units, consisting of supplies to non-statutory undertakings.

† This figure includes a "miscellaneous" item (as defined in the last note) of 56.8 million units.

* See p. 242.

The average number of units sold per head of population has steadily risen since 1920-21. In Great Britain as a whole the average number per head has increased from 88 in 1922-23 to 195 in 1929-30, while in the Survey Region the increase has been from about 170 in 1922-23 to above 330 in 1929-30.*

The significance of the figures in Table IV may be better gauged by referring to the series of indices in Appendix 9A, Tables II, III and IV,† which are based upon these figures.

In the year 1920-21, the total sales to consumers for all purposes (excluding bulk supplies given to other authorised undertakers) in the Survey Region amounted to 557 million units, or 15.8 per cent. of the total sales in Great Britain as a whole. In the year 1929-30, the corresponding figures were 1,276 million units and 14.7 per cent. Thus, although the total sales in the Survey Region had increased in the intervening period by as much as 129 per cent., the percentage increase in total sales in Great Britain was even larger, viz., 147 per cent. On analysing the total sales in search of an explanation of this proportionately greater advance of the total sales in Great Britain, it is found that it is accounted for mainly by the considerably slower development of the sales for traction purposes in the Survey Region than in Great Britain as a whole, notwithstanding the fact that in the year 1929-30 each of the three other items in total sales—sales for lighting and domestic purposes, for power and for public lighting—shows a higher percentage increase on the figures for the year 1920-21 in the Survey Region than in Great Britain.‡

It appears that until recent years the Survey Region possessed an abnormally large share of the electric traction, dependent upon the public supply of electricity, of the country, but Appendix 9A, Table II, seems to indicate that the demands of existing forms of electric traction in the Survey Region are not capable of much further expansion. The same table also reveals that the proportionately greater progress of total sales in Great Britain than in the Survey Region in the last decade is also due in minor degree to the relatively greater advance of lighting and domestic sales in Great Britain in 1928-29 and 1929-30, and of power sales between 1927-28 and 1929-30.

Another conclusion which the series of indices in Appendix 9 suggests is that, as might be anticipated by reason of the highly concentrated industrialisation of the Survey Region, the proportion

*The average consumption per head in the United States is estimated to be over 600 units. Great Britain ranks after Switzerland, U.S.A., Sweden and Germany in *per capita* production of electricity.

† See pp. 350-351.

‡ It should be noted that the trend of development of the aggregate sales between 1920-21 and 1929-30 closely resembles that of the output of public generating stations in the same period, and confirms the conclusion arrived at from the output figures that, after 1925-26, the Survey Region lost ground relatively to the rest of Great Britain, although, absolutely, both were advancing quickly. See above p. 240.

which sales in the Survey Region bear to those in Great Britain is considerably higher in the case of power sales than in the case of sales for lighting and domestic purposes. In the period 1920-21 to 1929-30, this proportion has varied between 9 per cent. and 11 per cent. in the case of lighting and domestic supplies and between 16 per cent. and 19 per cent. in the case of power supplies. It will be noticed that the year 1929-30 shows a decided decline in the proportion in both cases.

Table IV of Appendix 9A indicates clearly that the power sales constitute a much *greater* proportion, and the lighting and domestic sales a much *smaller* proportion, of the total sales in the Survey Region than in Great Britain as a whole. In 1929-30, in the Survey Region, lighting and domestic sales accounted for only 18.4 per cent. of the total sales, as compared with 27.0 per cent. in Great Britain.* On the other hand, in the same year, sales for power purposes accounted for 70.9 per cent. of the total sales in the Survey Region and only 62.4 per cent. in Great Britain. It is noteworthy, too, that though the proportion which lighting and domestic sales bear to total sales in the Survey Region has been steadily increasing since 1920-21, yet power sales have never in any year dropped below 70 per cent. of the total sales and have been a remarkably steady proportion of the whole. This maintenance of the relative importance of industrial power as a source of demand in the Survey Region may produce serious consequences for the supply industry itself because the power load is much less dependable than the lighting and domestic load in a period of economic depression, as the total sales in the Survey Region in 1921-22 and 1926-27 testify.† The considerable development of the lighting and domestic load in the Survey Region absolutely and also relatively to power sales and total sales is therefore a factor making for the stability of the supply industry and good evidence of the enormous potentialities of this load even in the face of working class conservatism in spending which industrial insecurity and a policy of stringent economy in national and local government tend to propagate.

The growth of sales in the Survey Region may usefully be compared with the sales, actual or estimated, of the North-Western Electricity Area.‡ The North-Western Area Electricity Scheme, 1928, contains estimates adopted by the Electricity Commissioners

* In the United States in 1930, 77.2 per cent. of the total units sold were taken by industry and commerce, and only 13 per cent. by domestic consumers, in spite of the immense progress made in domestic electrification. In Germany, industry and commerce take as much as 82 per cent. of the total.

† In Great Britain, on the other hand, the proportion which power sales bear to total sales has fallen from 71.2 per cent. in 1920-21 to 62.4 per cent. in 1929-30, the decline having accelerated after 1924-25.

‡ In 1926-27, the total sales in the Survey Region amounted to 965 million units or 74.7 per cent. of the total sales in the North-Western Area as a whole. The corresponding figures for 1929-30 were 1,276 million units and 74.1 per cent.

of the probable rate of growth of sales of the authorised undertakings in the North-Western Area up to 1940-41. In arriving at the estimates, regard was had to the likelihood of growth of demands for many purposes in areas as yet unserved as well as those already served, consequent upon the execution of the plans projected by the Commissioners in the Scheme, but not to the possibility of the provision of electricity by the Board's system to the railway companies for traction and other purposes. In Table V, the figures for the years up to and including 1926-27 are the results which were actually recorded, while those for the years subsequent to 1926-27 up to 1940-41 are the estimates made by the Commissioners.

TABLE V.

Sales (Recorded or Estimated) to Consumers by Authorised Undertakers in the North-Western Area. (In Million Units.)

1921-22	...	...	628	1931-32	...	...	2,252
1922-23	...	...	796	1932-33	...	...	2,484
1923-24	...	...	932	1933-34	...	...	2,739
1924-25	...	...	1,072	1934-35	...	...	2,997
1925-26	...	...	1,214	1935-36	...	...	3,260
1926-27	...	...	1,292	1936-37	...	...	3,542
1927-28	...	...	1,475	1937-38	...	...	3,835
1928-29	...	...	1,641	1938-39	...	...	4,140
1929-30	...	...	1,840	1939-40	...	...	4,460
1930-31	...	...	2,038	1940-41	...	...	4,790

It will be seen that the Commissioners' estimates contemplate that the number of units sold per annum to consumers in the North-Western Area will be doubled between 1927-28 and 1934-35, and trebled between 1927-28 and 1939-40. The economic depression of unexpected severity which overtook the Area in 1930 has caused the actual total of units sold in 1929-30 to fall far short of the estimated total. Conditions in 1930-31 have been so unfavourable for the power load that the 1930-31 total when it is announced is almost certain to widen the gap between the actual and the estimated sales.*

(e) Prices Obtained for Electricity by Authorised Undertakers.

Table VI affords a comparison between Great Britain and the Survey Region in respect of the revenue obtained for the sale of electricity to consumers by all authorised undertakers. It contrasts the trend between 1921-22 and 1929-30 of average prices per unit obtained by (a) all authorised undertakers in Great Britain and (b) all authorised undertakers in the Survey Region, for electricity supplied for lighting and domestic purposes, public lighting,

* The following are the actual sales and the estimated sales for the years 1927-28 to 1929-30 (in million units):—

Year ending 31st March.	Actual Sales Recorded.	Estimated Sales.
1928	1,471	1,475
1929	1,583	1,641
1930	1,723	1,840

traction, power, and all purposes respectively. It should be borne in mind that these prices are *average* prices (calculated by dividing the aggregate revenue obtained by all authorised undertakers in the area under review by the total number of units sold), and consequently only convey a general impression of the relation between charges for electricity for different uses in Great Britain and in the Survey Region. Nevertheless, they afford clues to certain important differences between the two areas. These can best be appreciated by referring to the series of indices in Appendix 9A, Tables V and VI,* which are based upon the figures in Table VI below.

TABLE VI.
Average Revenue obtained (in pence per unit sold).

Year.	Lighting and Domestic Sales.		Public Lighting Sales.		Traction Sales.		Power Sales.		Total Sales to Consumers.	
	Great Britain.	Survey Region.	Great Britain.	Survey Region.	Great Britain.	Survey Region.	Great Britain.	Survey Region.	Great Britain.	Survey Region.
1921-22	5.75	5.11	2.90	3.01	1.73	1.68	1.69	1.36	2.48	2.08
1922-23	5.30	4.71	2.45	2.55	1.45	1.41	1.30	1.03	2.07	1.72
1923-24	4.52	4.50	2.31	2.47	1.36	1.32	1.14	1.01	1.86	1.56
1924-25	4.20	4.08	2.10	2.10	1.29	1.23	1.07	0.93	1.75	1.45
1925-26	3.82	3.64	1.96	1.85	1.13	1.14	1.00	0.84	1.65	1.27
1926-27	3.59	3.36	2.00	1.88	1.17	1.22	1.14	1.02	1.76	1.42
1927-28	3.39	3.10	1.81	1.58	0.99	1.06	0.94	0.79	1.55	1.21
1928-29	3.05	2.84	1.69	1.60	0.88	1.02	0.86	0.75	1.44	1.16
1929-30	2.86	2.68	1.61	1.61	0.81	0.98	0.82	0.73	1.38	1.13

Source:—Annual Return of Engineering and Financial Statistics. Electricity Commission.

First, the indices show that in every year since 1921-22 the average revenue per unit obtained for sales for all purposes in the Survey Region has been at least 16 per cent. below the corresponding average revenue obtained in Great Britain as a whole. In 1927-28 the percentage rose to 22, but in 1928-29 declined to 19. Further, the average revenue per unit obtained for lighting and domestic supplies in the Survey Region has ranged between 3 per cent. and 11 per cent. below that obtained in Great Britain (save in the year 1923-24 when the average revenues obtained were almost identical). In the case of electricity supplied for power purposes, the Survey Region's advantage has been even greater than in the case of lighting and domestic supplies, its average revenue per unit never being less than 10 per cent. below that of

* See p. 352.

Great Britain in any year and even reaching 20 per cent. below it in 1922-23. Lastly, it should be noted that average charges for lighting and domestic supplies and for power supplies have shown a slightly smaller percentage decline in the period 1921-22 to 1929-30 in the Survey Region than in Great Britain, but broadly it may be said that in both areas the average charges both for lighting and domestic supplies and for power supplies have been halved in the course of this period.

The above table of average prices obtained by *all* authorised undertakers does not bring out one remarkable feature of the price system adhered to by the electricity supply industry in the Survey Region as in other parts of Great Britain, viz., the extreme diversity of the prices charged for lighting and domestic supplies and for power supplies respectively by the different authorised undertakers.

In Appendix 9A, Table VII,* instances are given of undertakers whose average revenue per unit in the year 1929-30 came near either the upper or the lower limit of variation; and, in addition, the average revenue per unit obtained by each County Borough undertaking in the Survey Region in that year is shown.

There is no one outstanding factor to which such a degree of diversity of average prices can be mainly attributed. There are certain general factors affecting the cost of supply which operate in greater or less degree for every undertaking, but a complete explanation of the average price per unit obtained by any undertaker for a particular class of supply would have to take account of any local conditions which tend to raise or lower the average price obtained for that class of supply.†

The following factors which affect the cost of supply in an area should be noted :—

1. The efficiency of the generating station from which supplies are drawn, in respect of working costs of generation.
2. The load factor of the station and that of the supply undertaking, considered in relation to the capital charges of generation, transmission and distribution.‡

* See pp. 353-354.

† Thus, the average revenue per unit obtained for lighting and domestic supplies in an area may be lowered if the proportion of such supplies represented by domestic cooking and heating rises and the proportion represented by domestic lighting falls. Again, the average revenue per unit obtained for power supplies will be affected by the number of large industrial power users who have had sub-stations installed in their premises (i.e., who take untransformed high-tension energy).

‡ A number of undertakings in the Survey Region (e.g., Blackburn Corporation) which have established new stations or made alterations or additions to existing plants in a period of high prices of materials, etc., have thereby incurred heavy capital charges which place them at some disadvantage as compared with other undertakings.

3. The burden of transmission costs where an undertaking takes bulk supplies from another undertaking or from outside sources. The situation of the generating station in relation to the population which it serves, and the load factor of the supply undertaking, are factors which go to determine the burden of transmission costs. Rural and sparsely populated areas are likely, then, to have to bear abnormally high transmission charges, the alternative being to set up nearer at hand very small generating stations of comparatively low efficiency and poor load factor.

4. The nature of the load upon the undertaking's system. Some undertakings are more fortunate than others in the possession of lighting, domestic, power, and other loads of a high degree of diversity, and which, by being mutually compensatory, conduce to the stability of the undertaking. Conversely, certain undertakings (e.g., the Rochdale, St. Helens, Stalybridge, Stretford, Lancashire Electric Power Company, and Mersey Power Company undertakings) are unusually dependent upon the power load, which may as time goes on become increasingly fickle and unreliable as its size becomes more nearly a function of the degree of current business activity.

5. The cost of fuel delivered to the generating station. Stations in the Survey Region which are not located in or near to the district of the Lancashire coalfields may suffer the handicap of relatively heavy transport charges.

Up to the present, little progress seems to have been made in the levelling up of charges for lighting or domestic supplies or for power supplies throughout the Lancashire industrial area, yet in the present economic condition of this area, since industrial and domestic users of electricity in different districts may be dependent for their livelihood upon the same industry or industries, it is certain that substantial diversity of charges for electricity in the different districts is incompatible with the public interest.

II.—The Use of Electric Power in the Industries of the Survey Region.

Table IV above shows that sales by authorised undertakers of electricity for power purposes to consumers in the Survey Region rose from 409 million units in 1920-21 to 904 million units in 1929-30, representing an increase of 121 per cent., and that the growth has been particularly steady, apart from a serious setback in 1921-22 and only a relatively slight advance in 1926-27. The advance has not been evenly distributed over the whole of the Survey Region, for even the County Borough undertakings have

registered widely different rates of expansion,* due partly to the lack of co-ordination of policy on electric power development between the numerous undertakers in the Region, and partly to the unequal incidence of the effects of the trade depression upon the different areas of supply. It is almost certain that the aggregate power sales in the Region in 1930-31 will prove not to have maintained the steady development of the earlier years and will even register an absolute decline from the 1929-30 level.† But there is nothing to indicate that the upward tendency of the secular trend of power sales is slackening in the Region as a whole, whatever may be the position in respect of certain industries, such as engineering, or of certain areas of supply.

In the present state of the power statistics of the Survey Region, it is impossible to assess the relative importance of the various factors which undoubtedly have contributed to or, on the other hand, militated against, the rise of the electric power load, or to say to what extent the growth of the electric power load of *public* supply undertakings has been at the expense of (a) the load on private electric generators, and of (b) the mechanical application of power.‡

A certain amount of information which, though by no means complete, may throw a little light on conditions obtaining in particular industries and in particular areas of supply in the Region, is, however, available on the following topics:—

* The following figures represent the growth in power sales of several important supply undertakings in the Region between 1920-21 and 1929-30:—

	Million Units Sold.	
	1920-21.	1929-30.
Blackburn	5.26	14.26
Burnley	1.59	2.50
Manchester	131.64	196.45
Preston	2.18	13.16
Rochdale	11.93	66.46
Stockport	15.69	27.97
Wigan	5.46	8.02
Lancashire E.P. Co.	38.83	107.91

† Comparative figures of power sales of several undertakings in 1929-30 and 1930-31 are as follows:—

	Million Units Sold.	
	1929-30.	1930-31.
Blackburn	14.26	10.53
Bury	19.20	15.41
Burnley	2.50	2.70
Manchester	196.45	185.20

‡ It should be remembered that an accession to the public electric power load in a given area may represent an absolute increase in the amount of power consumed by industrial establishments, as when a new firm adopts electric driving *ab initio*; or it may accrue from a change in the form in which power is transmitted, as when a firm converts from mechanical driving to electric driving; or it may result from a change in the source of supply of the electric power used, as when a firm abandons generation of electricity for power purposes in its own works in favour of a supply from a public supply undertaking. Again, the power requirements of a firm are directly related to the size of the firm and the degree of its business activity at any given time.

(a) The private generation of electricity for power and other purposes by industrial establishments.

(b) The analysis of public electric power consumption by industry.

(c) The degree of electrification of mechanical equipment in the different industries.

(a) *The Private Generation of Electricity.*

It is known that there is a considerable amount of private generating plant installed in industrial establishments in the Survey Region.* This plant may be generating electrical energy not only for driving electric motors but also for heating and lighting premises or for use in metallurgical, electro-chemical and other processes, while some of its output may be sold to outside establishments in commerce and industry, or even, in occasional instances in the coalmining and other industries, sold as a bulk supply to a public supply undertaking. No means are available at present of estimating the aggregate capacity of the private electrical generators installed in the Survey Region, or the aggregate capacity of electric motors installed in works which are driven by electricity produced in the works or brought from some outside source other than the public supply.†

Special enquiries in particular areas of supply have elicited certain points of information as to the extent of private generation of electricity in parts of the Survey Region. These are summarised in Appendix 9B,‡ but they are not comprehensive enough to provide a basis for generalization as to the whole Region.

The position of private generation of electricity, in the Survey Region, it is clear, deserves to be exhaustively examined. In Great Britain as a whole, the total capacity of private generating plant is estimated at 3 million kilowatts, i.e., almost one-third of the total plant in the country. The Censuses of Production of 1907, 1912 and 1924 showed that the growth in capacity of private plant was practically as rapid as the growth in capacity of public plant in the period 1907-24. Even since 1924 there has been no marked tendency for the installation of private plant to slow down. In the

* In addition, there is the private generating plant of the L.M. and S. Railway Company (for producing energy for traction, lighting and other purposes); and power plant installed in hotels, hospitals and other private and public institutions for the generation of electricity for their own use.

† The Preliminary Reports on the Third Census of Production of the United Kingdom (1924) and the Final Reports on special groups of trades afford useful information as regards industry as a whole and individual industries for the United Kingdom and for England and Wales and Northern Ireland respectively (e.g., as to capacity of public and private electric generators, capacity of electric motors installed, etc.), but unless comparable information can be extracted relating to Lancashire and portions of adjacent counties, or some similar region, the Census Reports can throw no light on the position in the Survey Region except in special cases, as e.g., in respect of the Cotton Industry. See p. 367.

‡ See p. 355.

United States, on the contrary, there has been no appreciable extension of private plant in industry since 1920, whereas a remarkable development of the public supply has greatly increased the degree of electrification in industry. This discrepancy between English and American experience is difficult to understand in view of the fact that the average price per kilowatt-hour of electricity sold to industrial power users is lower in this country than in the United States and the leading Continental countries, including Germany and France.

A factor of some importance in this connection is the differential advantage which was conferred upon privately owned generating stations in British industry by recent legislation, which de-rated private stations to the extent of 75 per cent., but denied similar relief to the stations of public electricity supply undertakings.* In the year 1929-30, the local rates paid by all authorised undertakings in Great Britain amounted to as much as 11.52 per cent. of the total working expenses (excluding capital charges) of those undertakings. On an average, out of every £100 of revenue from working during that year, no less than £6.68 was absorbed by local rates. It is estimated that rents, rates and taxes together constituted 15.95 per cent. of the total working expenses (excluding capital charges) in 1929-30, as compared with 33.34 per cent. and 13.15 per cent. for working costs of generation and distribution respectively. There can be no doubt that, disregarding this bounty to private owners, there is a large amount of private generating plant in use which is uneconomic and which could advantageously be supplanted by supplies from public stations. The whole question of the existence of private plant independent of the National Power Scheme is of fundamental importance and, in a depressed area like industrial Lancashire in particular, should be investigated intensively with a view to making the best use of our regional power resources.

(b) Analysis of Public Power Consumption by Industries.

The statistics of aggregate sales of electricity by authorised undertakers in the Survey Region for industrial power purposes do not in their present form lend themselves to classification according to industry. Consequently, it is impossible to construct indices either of the changes which have taken place since the War in the size of the load supplied to any industry throughout the Region, or of the distribution of the total power load between the different industries supplied, nor have we even such rough indices as would

* The following types of private generating stations have been de-rated: those which supply energy and light to railway undertakings (other than purely passenger railways) and dock undertakings; those which are part of an industrial premises and supply electricity to the factory in or near which they are situated; and those which supply electricity to collieries and are part of the colliery undertaking. Generating stations operated for the purposes of public supply are debarred from relief by the proviso to S.3(1) of the Rating and Valuation (Apportionment) Act, 1928.

be afforded if we knew the capacity of the electric motors installed in industrial establishments (classified according to industry)* which are driven by electricity purchased from the public supply.

Several authorised undertakers have, however, been able to furnish some measure of classification, by industry, of their power sales, or of the capacity of motors connected to their supply, over a number of years or for a single year. These statistics are set out and commented on in Appendix 9C.†

The several undertakings which have furnished these statistics do not adopt a uniform method of compiling and expounding them, and consequently it is not possible to aggregate them. Comment upon them must be particular rather than general in its nature.

In the areas of supply of most of the undertakings, a small number of industries account for a large proportion of the total consumption of electric power, but in those areas in which there is a wide range of industries and services it is evident that electric power can be adapted to widely different uses and conditions. Thus, Manchester Corporation in 1930-31 supplied two-thirds of its total power sales to three industries—engineering, textiles and chemicals. In 1930-31, cotton spinning and weaving firms in the Bolton Corporation's area took over 60 per cent. of the total sales to industry. Conversely, in Salford, while three or four trades are outstanding, there is a very large number of smaller trades and services which take electric power from the Corporation's supply, and even since 1924 several trades have emerged into prominence as users of electric power. The Trafford Park area, which is supplied by the Stretford and District Electricity Board, is particularly notable for the diversity of uses to which electricity is put in the "new" industries which have been developing there since the War.

All the undertakings for which statistics have been obtained have greatly increased their sales of electric power to industry since 1920. Some have made much greater progress than others. At one extreme, the sales of the Stretford Board increased from 16.9 million units in 1920-21 to 60.4 in 1929-30 and 62.8 in 1930-31, and those of the Lancashire Electric Power Company rose from 38.5 million units in 1921 to 107.9 in 1929 and 101.7 in 1930. The rate of progress was not so swift in Manchester and Oldham, while development has been regrettably small in some of the cotton weaving districts such as Burnley.

It appears that the growth of small and new industries which use electricity from the beginning has been an important factor in increasing the consumption of electric power. In the Manchester

* The Preliminary and Final Reports on the Third Census of Production of the United Kingdom (1924) give figures of capacity of electric motors driven by purchased electricity, classified by industry, but only in respect of the United Kingdom as a whole. If the figures for Lancashire and portions of adjacent counties, or some such region, were extracted, they would furnish a rough indication, for most purposes, of the position in the Survey Region.

† See p. 356.

area, for example, miscellaneous power sales doubled between 1923-24 and 1930-31, and even in 1930-31, sales to small industrial power users registered a further increase. Electrical and motor engineering are the two leading items in the power sales of the Stretford Board. The rapid increase in sales to rubber and artificial silk manufacturers since 1925 is an outstanding feature of the power statistics of the Lancashire Electric Power Company. On the other hand, the staple industries—cotton, coal and general engineering—have not substantially increased their demands except in the Bolton district and the area of the Lancashire Electric Power Company, and it is evident that the substitution of electricity for steam in these industries is likely to be slow so long as their financial position remains weak.

(c) *The Degree of Electrification of mechanical equipment in different industries.*

It is not possible to measure, even roughly, the extent to which electrification of industrial establishments has proceeded in the Survey Region as a whole or in individual industries therein,* because most of the material necessary for such an estimate (e.g., as to the capacity of prime movers of electric generators, and of electric motors installed) is at present not available.† Only one of the authorised supply undertakings in the Survey Region which have been consulted—viz., the Manchester Corporation undertaking—has been able to furnish statistical information on the subject of the degree of electrification attained in the industries of their areas. Further, there appears to be only one industry for which an estimate can be made of the degree of electrification of plant attained in the Survey Region. The results of the Censuses of Production of 1924 and 1930 provide material for such an estimate in the case of the cotton industry. The statistics relating to the Manchester Corporation undertaking, and the appropriate Census material, are summarised in Appendix 9D.‡

It appears that in the Manchester area steam is the only serious rival to electricity for industrial power purposes. In the eight industries considered, nearly 80 per cent. of motive power is applied

* With the exception of the cotton industry, for which rough estimates will be found below, p. 373.

† See Eighth Annual Report of the Electricity Commissioners (1929), for an official estimate of the extent to which electric driving had been applied to industrial machinery in the United Kingdom up to 1924, based upon the Preliminary Reports on the Census of Production, 1924. The economic and statistical department of British Electrical and Allied Manufacturers' Association publish from time to time estimates of the degree of industrial electrification in Great Britain and certain foreign countries, including U.S.A. and Germany, but it seems that their method of arriving at the estimates differs somewhat from that used by the Electricity Commissioners. The 1924 Census of Production material, with the single exception of the material on the cotton industry, could only be serviceable to our purpose if the necessary information concerning industries in Lancashire and portions of adjacent counties were extracted and classified.

‡ See p. 365.

electrically, electric power being practically universal in engineering. Steam is important in cotton (57 per cent. of total), and brick making (73 per cent.). The statistics suggest that the Manchester undertaking cannot appreciably extend its power connections by the substitution of electric driving for mechanical driving in existing establishments in its area unless a revival takes place in the condition of the cotton industry, and that it must look rather to small power users in the smaller and newer industries for the expansion of its power load.

The Census of Production results as to electrification of plant in the cotton industry suggest the following conclusions. The total capacity of prime movers of all kinds installed in the industry in the United Kingdom increased by 1 per cent. between 1912 and 1924, notwithstanding the decline in output and employment capacity. But between 1924 and 1930, the total capacity fell by 14 per cent. On the other hand, the total capacity of electric generators installed was continually increasing from 1907 to 1930; between 1924 and 1930, there was an increase of 43 per cent.* Similarly, the capacity of electric motors installed has been growing rapidly, the increase between 1924 and 1930 being 35 per cent. It appears that the number of establishments in cotton which use electric power generated in their own works is still increasing. Between 1912 and 1924, the total horse power of motors driven by purchased electricity† made much greater headway than the total horse power of motors driven by factory-produced electricity, but between 1924 and 1930 both aggregates have increased at roughly the same rate. In 1930, more than 70 per cent. of the total electricity used for all purposes in the industry in Great Britain was purchased, the remainder being produced by firms in their own works.

Since 1924, electric driving has made good progress in both sections of the industry at the expense of the mechanical application of steam power. The quantity of power available for mechanical application has declined, yet the capacity of electric motors installed has been increasing. As a result, the percentage of total available power which is applied electrically in the British cotton industry has risen from about 18 per cent. in 1924 to about 27 per cent. in 1930.‡ Notwithstanding this increase, however, steam remains much more common than electricity, and the degree of electrification is still much lower in the British industry than in those of U.S.A. and Germany.

* In 1930, 76 per cent. of H.P. of prime movers and 80 per cent. of Kw. capacity of electric generating plant installed in the industry in Great Britain were to be found in the spinning section.

† The great bulk of this will be purchased from authorised undertakers.

‡ See Appendix 9 D, Table IX on p. 373.

Finally, it has been estimated that in 1930 rather more than one-fifth of the total units of electricity sold to consumers by authorised undertakers in the Survey Region was represented by sales to the cotton industry.

III.—Electrification and Physical Output.

The value of many of the advantages claimed for the use of electricity in industry cannot be assessed quantitatively. Thus, the cleaner atmosphere of electrified factories and the contribution which electrification makes to the abatement of the smoke nuisance in our towns are merits of this kind. In other cases, the application of electricity yields substantial economies of an indirect character. Instances of this sort are the extreme steadiness of electric drive, especially if individual drive be adopted, and the facility with which electric power can be transmitted to any part of the plant. It is sometimes possible to determine precisely the increase in physical output per head which directly results from the application of electricity to machines and tools. One example that has been noticed is that of a brick-making firm, which installed an electrically worked mobile excavator in its clay pit. It has been found that one man operating the plant from his seat in the cab of the machine can normally dig as much clay per day as, prior to the installation, six men could handle. A still more interesting example is provided by an up-to-date dairy farm at which by the introduction of the electric milking of cows two men can now do work formerly done manually by five men. The use of electricity in the coal mine,* particularly for coal cutting, and in chemical works, as in the manufacture of caustic soda, has brought about increased output per head in many instances noted.

While it would be unsafe to infer that every industry could supply data of like savings in labour costs through electrification, there is enough evidence to show that this aspect of electrification is more important than is commonly acknowledged, and one which should be taken into account in the further study of the labour problems of the near future in the Survey Region.

IV.—The Supply of Electricity for Domestic Purposes.

In a highly industrialised area, there is a tendency for Supply Authorities to pay a disproportionate amount of attention to the electric power load to the neglect of the domestic load. There are at least two reasons why this course is often inadvisable. In the first place, it is easy to exaggerate the importance of reducing the power costs of establishments in industry. It is true that cheaper electric power may help an industry to reduce its costs and so to increase its sales and its capacity to give employment to labour, and that industrial prosperity is a prime condition of the

* See Chapter 7, Part II.

continued development of domestic consumption of electricity. But, conversely, the effect of cheapening electrical energy for domestic use is also likely to be beneficial in that it releases purchasing power which may be used to increase the domestic consumption of electricity and electrical apparatus or of the products of manufacturing industries. Secondly, a Supply Authority which is mainly dependent upon its electric power load is, *under post-war conditions of demand*, more liable to encounter a decline in output and a check to its efforts to reduce the price of electricity in years of trade depression than an Authority which has the advantage of the compensatory influence of a large and expanding domestic consumption. The statistics of domestic consumption in the Survey Region show that, notwithstanding these attributes of the domestic load, there is still immense scope for further expansion.

Sales of electricity by authorised undertakers for lighting and domestic purposes in the Survey Region have increased from 56.6 million units in 1920-21 to 235.2 million units in 1929-30, being a percentage increase of 316 in ten years. In fact, the rate of growth has even tended to accelerate since 1923-24, and this load, unlike the industrial power load, probably registered another large advance in the year 1930-31.*

A large number of quite distinct uses of electricity are grouped together in the category of "lighting and domestic uses"—lighting of all kinds (other than public lighting), heating of all kinds, and miscellaneous uses such as cooking, cleaning, washing, and drying. The available statistics do not distinguish between sales to business premises and sales to domestic consumers, but investigation reveals that though the requirements of business premises for lighting, heating, etc., have shown a considerable degree of expansion, the almost inexhaustible potentialities of the "lighting and domestic" load rest mainly in the domestic use of electricity for a wide variety of purposes. For, notwithstanding the rapid development since 1920, the average number of units sold for lighting and domestic purposes per head of population in the Survey Region in 1929-30 was only about 56. It has been estimated that of the dwelling houses situated in the Survey Region, only about 32 per cent. were wired for electricity at the end of the year 1930-31, and the proportion of these houses which use electricity for all purposes—lighting, heating, cooking, and power—is very small indeed.† Each item in the domestic load has its own special attributes from the

* In the year ended March 31st, 1931, the Manchester Corporation undertaking's sales for lighting and domestic purposes under all tariffs were 73.1 million units, as compared with 66.1 million units in the previous year, and 62.4 million units in 1928-29. The corresponding figures for 1929-30 and 1930-31 for certain other undertakings were:—Bury: 1929-30=3.3, 1930-31=3.53; Blackburn: 1929-30=6.6, 1930-31=7.0.

† It has been estimated that 68 per cent. of the dwelling houses in the United States enjoy an all-electric service. In Great Britain as a whole only about 30 per cent. of dwelling houses are wired for electricity.

point of view of the supply undertaking, and the load as a whole has a good diversity factor, yet the prices charged to the domestic consumer are likely to remain unduly heavy so long as the load is so small in relation to expenditure incurred in low tension distribution and standing charges generally. The need for a bold selling policy may be greatest in rural areas, but it is an undoubted fact that not enough attention is paid at present to the organised "marketing" of electricity to domestic consumers in the thickly populated areas such as the Survey Region. In due course, when the function of generating electricity has been completely brought under the control of the Central Electricity Board, with resultant savings in the cost of generation, a Supply Authority's main task will be, by propaganda, assistance to consumers and co-operation with other Authorities, to develop the demand for electricity so as to lighten the burden of distribution costs. Taking all authorised undertakers in Great Britain in the year 1929-30, interest and sinking fund charges assignable to distribution were more than twice as great as the working costs of distribution; whereas in the case of generation, working costs were much the larger item.*

A comparison of the current prices charged for electricity to the domestic user with the savings which it is contemplated will accrue from the complete establishment of the "Grid" Scheme in the North-Western Area reveals the limitations of regional planning which does not extend to the sphere of distribution. In the year 1929-30 the average price received by all authorised undertakers in the Survey Region for electricity sold to consumers of all classes was about 1.13d. per unit, as compared with 1.38d. per unit in Great Britain as a whole, while the average price received for electricity sold to domestic consumers was as much as 2.68d. per unit in the Survey Region and 2.86d. per unit in Great Britain. The recorded sales to consumers in the North-Western Area in 1929-30 totalled 1,723 million units, which figure is 117 million

* The following figures show the percentage distribution of expenditure chargeable to capital account incurred by (a) public authority undertakers (b) all authorised undertakers in Great Britain at the end of 1929-30:—

					<i>Public Authorities.</i>	<i>All Undertakers.</i>
Generation	...	...	...	...	39.73	39.86
Main Transmission	...	...	...	...	2.70	5.01
Distribution	...	...	...	...	54.00	50.92
Miscellaneous	...	...	...	...	3.57	4.21
					100.00	100.00

The percentage of total capital expenditure assignable to transmission and distribution continues to show an upward tendency. In the year 1929-30, in the case of all public authority undertakers, working expenses (excluding capital charges) absorbed 57.5 per cent. of total revenue from all sources, working costs of generation accounting for 20.9 per cent. and all other working expenses 36.6 per cent. At the same time, interest charges, and loan repayment, sinking funds and reserve funds charges absorbed respectively 16 per cent. and 21 per cent. of total revenue.

units lower than the estimate arrived at by the Electricity Commissioners and mentioned in the Supplementary Particulars relating to the North-Western Area Electricity Scheme, 1928. The same particulars contain an estimate that when the "Grid" Scheme is fully established in the Area (round about the year 1936)* the gross annual saving of the Scheme as compared with individual development of undertakings will amount on an average to about 0.0507d. per unit sold. The saving will increase in subsequent years as the load upon the "Grid" grows in relation to capital charges, but many years must elapse before the "Grid" Scheme, standing alone, can produce a substantial reduction in the average price per unit sold to the final consumer. A saving of no more than one-twentieth of a penny does not appear important in relation to an average price of 2.68d. per unit paid by domestic consumers.

Organisation of distribution is, then, as vital as organisation of production, and the inter-dependence of the two sides of the electricity supply industry is such that the fact should never be overlooked that the "Grid" Scheme for the reorganisation and control of generation deals only with one of the essential aspects of reorganisation.

Up to the present, in approaching distribution problems, concentration has been made for the most part upon two difficulties encountered by the Supply Authorities and their domestic and commercial customers. One is the problem of the initial expense of wiring premises and acquiring electrical apparatus, which many Supply Authorities are meeting by offering assisted (i.e., deferred payment) wiring schemes and facilities for the hiring and/or hire-purchase of electrical apparatus.† The replies to a questionnaire on this subject sent in the course of this Survey to every Supply Authority in the Survey Region have yielded the following information :—

Supply Authorities Making Returns.

(i) County Borough Undertakings	...	...	12	out of 14
(ii) Municipal Borough Undertakings	...	...	13	" 15
(iii) Urban District Undertakings	...	...	9	" 21
(iv) Joint Boards of Local Authorities	...	...	3	" 3
(v) Electric Power Companies	...	...	3	" 5
Total	...	...	40	" 58

* The estimate of sales in the Area for the year 1935-36 is 3,260 million units. See p. 244.

† See the Report of a Committee on Assisted Wiring and the Hiring and Hire-Purchase of Electrical Apparatus (appointed by the Electricity Commissioners in 1929).

*Particulars concerning Authorities which made Returns.**(a) Assisted Wiring.*

The Authorities can be classified as follows:—

Kind of Authority.	Authorities incurring expenditure on provision of facilities before end of year 1930-31.	Authorities which have commenced expenditure since 31st March, 1931.	Authorities which have not yet incurred expenditure, but which have now adopted schemes.	Authorities which have not yet adopted schemes.
County Boroughs ...	9	1	1	1
Municipal Boroughs	8	3	0	2
Urban Districts ...	4	0	0	5
Joint Boards ...	2	0	0	1
Power Companies ...	0	2	0	1
Total	23	6	1	10*

* Three Authorities which have not yet adopted schemes reply that they are at present engaged upon preparing schemes.

The expenditure incurred on the provision of facilities for assisted wiring by 23 Authorities is as follows:—

Kind of Authority.	Expenditure incurred during the financial year					Total expenditure incurred at the end of the year 1930-31
	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	
	£	£	£	£	£	£
County Boroughs ...	—	3,061	13,617	31,583	70,818	119,079
Municipal Boroughs	72	—	63	5,802	5,771	11,708
Urban Districts ...	—	—	180	318	275	773
Joint Boards ...	6	997	2,826	8,643	15,938	28,410
Power Companies ...	—	—	—	—	—	—
Total	78	4,058	16,686	46,346	92,802	159,970

It will be seen that the bulk of the expenditure has been incurred in the last two years, chiefly by County Borough undertakings. Considerable progress has been achieved in the present year, probably under the stimulus of the recommendation of the Report of the Committee on Assisted Wiring, published in 1930, to the effect that facilities should be afforded in all areas as soon as

possible,* but much still remains to be done before the position in the Survey Region, and particularly in the areas of urban district undertakings, can be regarded as satisfactory, because, as has been mentioned already, no more than 32 per cent. of the dwelling houses situated in the Region are yet wired for electricity and only a small proportion of these possesses an "all-electric" service.†

(b) *Hiring and hire-purchase of apparatus.*

Some of the Authorities making a return have been affording facilities of this kind in some form for many years, but principally schemes have been adopted since 1923. Three urban district undertakings, two joint boards and one company reported that they had not yet adopted schemes, though one indicated that a scheme was at present being considered. Another element of diversity exists in the nature of the schemes in operation in the different areas, since some Authorities provide only hiring or hire-purchase facilities, and not both. It seems, then, that here, again, there is room for the extension of facilities territorially and for greater uniformity in the details of and the methods of working the various schemes already in operation, as advised by the Committee of 1930. It is desirable also that increased effort should be exerted by all interests to reduce the cost of electrical apparatus of all kinds, and particularly apparatus for domestic use, for there is reason to believe that the present costs are so high absolutely and in comparison with the costs of gas apparatus that, despite the advantage of hiring and hire-purchase facilities, they are providing a great obstacle to the wider use of electricity and consequently to the growth of the load on the public generating stations.

The second important distribution problem to which the supply industry is paying attention is that of securing uniformity of tariffs and methods of charge for electricity in different areas of supply. There is no doubt that the form of tariff adopted is a matter of great consequence both to consumers of each class of supply (*viz.*, to

* See p. 257, note †. It was recommended, further, that it should be the aim of the industry to secure uniformity of practice in all areas as to the content of schemes and the organisation for dealing with them.

† It is strange that no more than 14 Authorities of those which replied to the Questionnaire (five County Boroughs, four Municipal Boroughs, two Urban Districts, one Joint Board, and two Companies) undertake the wiring of premises by "direct labour." Wiring carried out by the Supply Authority will come directly under the surveillance of its engineer; the authority which supplies the credit will be carrying out the work, and the undertaking will be furnished with greater opportunities of canvassing for the sale of apparatus from its showroom. The Supply Authority's motive in giving credit facilities to consumers on behalf of the private contractors is no doubt to encourage the sale of electricity in its area. But such public assistance to private traders is an unusual departure, and in the interests of the public and of the good conduct of public authority undertakings should be hedged about with proper conditions and safeguards especially if the Supply Authority is not also engaged in wiring premises under the Scheme.

domestic premises, business premises, and large and small industrial power users) and to the Supply Authority itself. At present, in the Survey Region, as in the rest of the country, there is an unnecessary multiplicity of modes of charge, which is due partly to the present unsatisfactory legal position of non-statutory tariffs and partly to the lack of co-operation of Supply Authorities in the determination of forms of tariff. There is a clear need, therefore, for concerted action by Authorities for carrying to the furthest practicable limits the standardization of tariffs for each class of supply.*

Greater uniformity in the *quantum* of charges made for electricity to the different classes of supply by different undertakers is just as desirable as greater uniformity in the form of charges. But the solution of this problem, like that of the greater problem of reducing distribution costs all round, seems to be impeded by the lack of co-ordination between the very large number of Authorities in the Region for the purpose of settling a common policy, increasing sales and reducing distribution costs per unit of output. It may be realised very soon that there is no particular scientific justification for retaining the local authority as the unit for the purpose of selling electricity and that further progress depends upon the extension of regional operation and inter-connection of small units.

V.—Summary and Conclusions.

There is no important respect in which the electricity supply industry in the Survey Region suffers by comparison with the industry in other parts of the country. It has been active in carrying through the measures of re-organisation for the purposes of generation and transmission of electricity which have sprung from the Electricity (Supply) Acts of 1919 and 1926. Notwithstanding the post-war contraction of the staple industries of the Region and the short-period fluctuations of business activity in the last decade, output of electricity has expanded steadily, and industrial and domestic consumption of electricity has increased rather more rapidly in the Region than in Great Britain as a whole. The average revenue obtained by all authorised undertakings per unit

* The Report on Uniformity of Electricity Charges and Tariffs by a Committee appointed by the Electricity Commissioners in 1929 suggests that some kind of multi-part tariff should be offered for each class of supply in every area, urban or rural, as an alternative to the crude flat rate or "block" or "step" method of charge, and efforts should be made to persuade consumers to adopt the multi-part tariff; further, it suggests which of the existing modes of charge for each class of supply are most suitable for general adoption. One cannot hope that the fixed charge portion of a multi-part tariff can be determined with scientific precision, not even as between different consumers in a particular class of supply, and certainly not as between different classes of supply, but, generally speaking, it seems that a multi-part tariff can be rendered more equitable as between different consumers and different classes of supply than a flat rate, and made to give a greater impetus to the consumption of electricity.

of electricity sold for power purposes and for lighting and domestic purposes has been substantially lower in the Region than in the whole country, in every year since 1921-22, and has been approximately halved in the Region between 1921-22 and 1929-30. It is to be noted, though, that in the last two years aggregate sales for all purposes in the North-Western Electricity Area (which includes the whole of the Survey Region) have failed to reach the levels anticipated by the Electricity Commissioners who drew up the " Grid " Scheme for that Area in 1928.

The regrettable insufficiency of really reliable and convenient statistics on electric power and industrial electrification in the Region seriously limits the degree of precision which conclusions on this subject can attain, but it is possible to indicate certain tendencies.

In the first place, the power load has been gravely affected by the slump of the last two years, but there is reason to believe that the rapid progress of this load which was so marked before 1930 will be resumed when the slump has passed, and, given stable conditions, will continue for many years. At the same time, it does not seem to offer as much scope for expansion as the domestic load.

Secondly, the available indices of electrical development reveal that the progress of electrification of machinery has not been at a uniform rate in different parts of the Survey Region or in the different industries located in it. Certain industries in certain areas are almost completely electrified, and their requirements cannot expand very much in the future unless a revival of trade brings about an extension of productive capacity. The rise of new industries which use electricity from the beginning and the decline of older industries which are only partially electrified should gradually bring the industries of this country more into line with those of the other leading manufacturing countries in the use of electric power. Still, there is no doubt that much can be done to spur on the electrification of the industries of the Survey Region by lowering the obstacles which stand in the way. In particular, concentration should be made upon such barriers as the undue degree of diversity in the mode of fixing charges and tariffs and, more particularly, in the *quantum* of charges in different areas; the factor of shortage of capital which besets the individual firm of small and dwindling resources, particularly in the cotton industry; and technological difficulties upon which knowledge and opinions should be pooled. Above all, if industrial electrification is an essential aspect of technical rationalization, it should be studied as such by all parties with a view to the determination of uniform policies and lines of co-ordinated action for the whole Region.

Thirdly, it should be noted that uses for electric power are being found in almost every industry, and that already in many industries the versatility of electric power is being exhibited by the great diversity of uses to which it is being put. The quantitative

relation between physical output and the demand for labour before and after electrification of machines and tools in some of the smaller industries which are making constant changes of this nature is a subject which merits the closest attention.

While it is essential in the interests of the manufacturing industries of the Region that the cost of electric power should continue to fall, it is no less desirable both on economic and general social grounds that the domestic consumption of electricity should be stimulated in every possible way. The domestic load has been expanding rapidly since the War, and in the last two years many Supply Authorities have commenced to offer assistance to consumers for the wiring of houses and the purchase or hiring of electrical apparatus, but domestic consumption per head and the proportion of houses wired for electricity are still lamentably small. There appear to be three directions in which, by increasing the efficiency of the supply industry, improvement may be achieved. Firstly, uniform and attractive facilities for wiring and for the purchase and hiring of electrical apparatus should be provided in all districts. Secondly, the industry should endeavour to obtain the greatest possible degree of uniformity both in the methods of fixing charges for electricity and in the *quantum* of such charges throughout the Region. Thirdly, the existing organisation of distribution of electricity in the Region should be scientifically analysed with a view to promoting co-ordination between the numerous Supply Authorities on all questions of "marketing" electricity. It may be found that the existence of numerous relatively small Authorities, each supplying an arbitrarily defined area, makes for inefficiency, and that some measure of regional co-operation or the creation of larger Authorities would, by producing a more rapid expansion of the load upon the power stations, directly enhance the success of the "Grid" Scheme and reduce the overhead costs of distribution.

CHAPTER 12.

AGRICULTURE AND EMPLOYMENT IN LANCASHIRE.

Soil, climate, configuration and altitude predetermine the character of agriculture in any district. The influence of markets confirms or modifies this character. The slopes of the Pennines on the eastern side of Lancashire have from early times been the grazing ground of cattle and sheep. The growth of towns interspersed at frequent intervals among the farms on these slopes has brought a market for milk close to the places of its production. This has led to an increase in the number of cows, the class of stock which calls for the employment of most labour in milking and feeding. Hills, soil, climate and market work well together in maintaining a prosperous industry, a short carriage of milk on account of its bulk and of its perishable nature being of mutual advantage to producers and consumers. The combined business

of selling the milk retail and of producing it, which nearness to the market makes possible, gives more stability to the position of the farmer, and maintains in effect a larger population on the land, than the more specialised business of production which prevails necessarily in more remote parts.

On the western side of Lancashire in that large section of the county between the Ribble and the Mersey, the soil and level surface co-operating again with the growing market have lent themselves to a style of farming which employs a large amount of labour. Ploughed land with potatoes and green crops coming frequently occupies a high percentage of the total area in this part of the county. Some of the soil has been naturally amenable from the first, and some, like peat and too light sand, has been made amenable. Farmers have used their opportunity well; they have grown the bulky and perishable crops which give them an advantage in the market nearer to them than to any others. The reclamation of moss land, a difficult and expensive operation, was actively carried on by former generations. More could be done, but it has been almost entirely discontinued, like many other arduous and expensive undertakings. If they do not go forward in this direction, farmers still keep a tenacious hold on the plough. In 1913 in the Ormskirk Division, with 46,000 acres under crops and grass, 87.7 per cent. was ploughed; in 1930 there was still 87.5 per cent. under the plough.

The area under grass in the east and north is much larger than the area under the plough in the west and south. Outside these the farming is more mixed. There are the small farms approaching market gardens in size and system, along the Merseyside and in a few other localities. Elsewhere the farms consist of grass and arable, and the decrease in the latter has gone on at a rate similar to that at which it has proceeded in other parts of England. In 1900 the total arable land in Lancashire was 246,250 acres; in 1913 it was 236,765; and in 1930 it was 206,897.

The scope for employment in agriculture here and everywhere depends, (1) on the extent and character of the land available as a basis for farming, (2) on the support given by markets, and (3) on the fulness of the farmers' use of the opportunities offered by both. With reference to the first condition there has been a steady and considerable diminution of the area due to the encroachment of other industries, to absorption of farming land for residences for the growing population, and largely to the dismantlement of farms in connection with the provision of water supplies to the towns. This curtailment of the actual geographical basis of agriculture has undoubtedly reduced the amount of labour employed, although there are no figures to measure accurately either cause or effect.

An indication of how far the second condition has been provided is given by the figures showing the increase in population. As will be seen later the relation between a growing population and an

extension of local agriculture is limited. The population of Lancashire was 673,186 in 1801; 2,031,236 in 1851; 3,418,967 in 1901; and 4,928,359 in 1930. The growth was steady and rapid, and being entirely of a non-agricultural character it may be taken as a direct indication, if not an exact measurement, of the growth of a market.

The most important question remains, that of the third condition, how far the farmers are making use of their opportunities. How much labour are they employing, and could they employ more? If there were figures to tell how many acres were being cultivated and information about the manner of cultivation, facts which determine how much labour is employed; if there were figures giving the numbers of animals which were demanding attention; some idea of the relations between the character of the market and the effort made by Lancashire agriculture to supply it would be obtained. There are no figures suggesting the area of land under cultivation in the early part of that period, but in 1803 a census of the numbers of certain classes of live stock was taken on the alarm of a French invasion. These numbers were 84,527 cows, 648 oxen, 54,573 young cattle, 80,772 sheep and goats, 30,982 pigs, 5,747 saddle horses and 26,660 draught horses. On the strength of the growing population and market the numbers of live stock steadily increased. In 1866, the year in which the present systematic returns were introduced, the cows in milk had risen to 106,952. In 1871 they were 116,892; in 1881 they were 122,683; and in 1891 they were 141,125. From that year they have fluctuated about this level. In 1921 they were 136,877, and in 1930 they were 138,817. In 1931 they increased to 145,880, for which year the total numbers of live stock were dairy cattle 145,880; young cattle 85,240; sheep 398,920; pigs 98,560.

So far as dairy cattle are concerned they increased by 56.598 or by 66.9 per cent. between 1803 and 1891. In the same period the population increased by 3,284,720 or by 487.9 per cent. Between 1891 and 1921 the population increased by rather more than a million, and the only branch of livestock which has shown a consistent and substantial increase is poultry. Since the War, dairy cattle have lost rather than gained and young cattle have definitely lost. For the six years 1891-1896 the average number of young cattle was 101,844, while for the six years 1926-1931 the average was 83,505.

There was a much larger numerical increase in sheep between 1803 and 1891, but here again, within limits, there has been a stabilisation or loss of elasticity. There were in 1891, 367,352 sheep; in 1921 there were 283,065, and in 1930 there were 364,603. Sheep, kept on the grass as they are here, do not absorb much labour in their care.

The numbers of pigs change rapidly in short periods, but remain fairly constant over long periods.

The outstanding change, and that in the form of an increase, has been in poultry. Lancashire has led the other counties in developing this industry. In 1921, when the first returns were made, there were 2,267,238 fowls in the county; in 1930 they had increased to 6,134,558. Whether they are only a branch of farming or the whole of it, on different farms poultry demand and pay for the employment of a moderate amount of labour. This is possibly the largest and most definite movement calculated to increase or hold labour in agriculture.

Turning from livestock to cultivation there has been a loss in the acreage under the plough. In 1901 there were 245,885 acres of arable land in Lancashire; in 1911 there were 239,401, and in 1930, 206,897. Along with this numerical decrease there has probably been a more intensive use of a certain part of the area. The main crop which has been responsible for the employment of most labour is potatoes. It is from it also that the greater part of the arable farmer's income is drawn: Lancashire farmers have been unlucky with this crop. A disease which has brought an embargo on export, beyond the area where it prevails, and from which other districts are free, together with a quality inferior to the best, handicaps them in their market. They have made an admirable fight against this handicap. They cannot change their soils from black or grey to red, even if they might by an almost unimaginable effort unite in the use of varieties immune from the disease. With pressure from more favoured areas like Lincolnshire, where the acreage has largely increased, and with the embargo on export, the acreage in Lancashire has fallen from the neighbourhood of 45,000 before the embargo to less than 40,000 acres. The latter figure in 1929 coincided with the glut and ruinously low price, and was followed by 35,000 acres in 1930. Besides potatoes, cabbage crops are grown for the markets in Lancashire towns, and their growers benefit not infrequently from the shortage of supplies in the South of England, due to drought or frost which are less felt in West Lancashire.

The extent to which urban industries have curtailed the area available for the practice of agriculture is suggested by figures from the returns. In 1901 the total acreage under Crops and Grass was 822,186 acres. In 1930 this had fallen to 716,419 acres. Whether the difference—105,767 acres—has been taken for building and other urban purposes, or has gone back to rough grazing, arable and live stock farming has a basis so much smaller on which to employ labour.

A significant, or at least interesting, question arises about the relation of the growing demand, as represented by the growing population of the county, to its capacity to supply the larger quantity of milk and dairy produce. The supply from local sources seems to have grown at a disproportionately slow rate compared

with the demand from 1801 to 1891, and to have stopped then while the latter has gone on. The output of less than 140,000 cows seems to be all that the Lancashire farmers have been able to give for forty years.

For the remainder of the liquid milk the population has drawn on neighbouring counties and for other dairy produce on them and on the rest of the world. However desirable it is that the local supply should be increased and by consequence more labour employed locally, there seems to be no method of securing its immediate accomplishment.

The fortunes of agriculture are related closely to those of the urban population. As early as 1925 farmers with retail milk rounds said that when factories went on short-time the amount of milk bought by a family went down at once from a quart to a pint. Short-time and the closing of factories have intervened frequently since then. Farmers now report that they have to sell part of their milk by gills, an unusual and troublesome experience.

The figures from the Census Returns from 1841 to 1921 giving the number of people engaged in agriculture in Lancashire show the direction in which things are moving.

1841	...	...	46,933	1891	...	...	46,067
1851	...	...	62,978	1901	...	...	43,880
1861	...	...	65,466	1911	...	...	40,092
1871	...	...	53,436	1921	...	...	40,992
1881	...	...	51,099				

The decrease in the number of holdings since returns were first made shows the same movement.

In 1903	there were	20,234	different	holdings.
" 1911	" "	19,406	" "	" "
" 1921	" "	18,151	" "	" "
" 1931	" "	17,130	" "	" "

The encroachment of towns with all that they demand in the form of roads, waterworks, factories and residences is responsible for some of this decrease. There has also been an amalgamation of holdings, and the movement, from whatever cause it arises, is probably accompanied by a proportionate reduction in the number of people employed.

Account should be taken of the slow but relentless development of labour-saving machinery. Less scope for this exists in this area than in other parts of the country, but milking machines installed here and there, more in Cheshire than in Lancashire, reduce the demand for manual labour, while field implements in some measure produce the same result.

The relations between Lancashire's urban population and Cheshire's farming show some features differing from those described above. With less opportunity for retailing their milk

Cheshire farmers have sent it in bulk or in the form of cheese, and through the feeding of the bye-product—whey—in the form of bacon, to the Lancashire markets among others. Since the sixteenth century the county may be said to have advanced steadily in dairy farming. While the increase of cows in Lancashire became intermittent after 1891 Cheshire has made consistent progress.

In 1871 the dairy cattle were	89,771	In 1911 the dairy cattle were	117,011
„ 1881 „ „ „	91,666	„ 1921 „ „ „	117,651
„ 1891 „ „ „	104,247	„ 1931 „ „ „	136,180
„ 1901 „ „ „	106,456		

Between the years 1871 and 1931 there has thus been an increase of 51.6 per cent. in the number of dairy cattle in Cheshire as against an increase of only 24.7 per cent. in Lancashire. The milk to supply the demand of Lancashire's larger population has come in greater measure from Cheshire and certainly from the nearer divisions of Derbyshire, Staffordshire, Shropshire and from other sources more or less remote. The increase in dairying in Shropshire is shown by the increase in the number of dairy cattle from 63,604 in 1900 to 100,288 in 1930 and in Staffordshire by an increase from 79,185 to 108,433.

This increase in the number of cows within the zone of the Lancashire supply has no doubt contributed to the problem in the milk trade which arose in October, 1931. More milk came in from all sources than was required for the effective demand. The retail price has been cut to 5d. a quart in a number of districts to the accompaniment of recriminations among farmers themselves. A similar difficulty, probably less acute in most parts, has arisen throughout the country. In the general search for a profitable line of investment in farming there has been one of those periodical surges into milk production which has returned to embarrass every one participating. Cheesemakers became milk sellers, and milk sellers increased their output, and both are now withdrawing from their new or deeper incursion into this overcrowded field. These reductions in the price of milk fortified, it is hoped, by reductions in the cost of production will enable the home article to displace the imported. In the competition for the market Lancashire will still be favoured by proximity, but there is no great elasticity, no great scope for expansion, in the situation. This applies to every branch of general agriculture. With the geographical or physical basis of the industry curtailed and with the market for its products weakened there is no foundation on which it may extend. A reservation may be made in this generalisation. It might be, as with poultry, that there is some line, more probably in the market garden sphere, which could be followed and developed with success.

It might also be possible to pass certain strictures on the practice of farming, and point to where the adoption of certain methods and the employment of more capital would lead to the employment of

more labour. This has often been done in the past, but however well and convincingly it might be done, it would be futile to believe that it was of any use for the purpose of this Survey. Systematic work to reduce the cost of production does not give sudden or spectacular results. The natural, and indeed the only, basis for an increase of employment in agriculture is a revival of prosperity in the great non-agricultural population of Lancashire.

CHAPTER 13.

EMPLOYMENT BY LOCAL AUTHORITIES.

The statistics of insured and unemployed persons in the "Local Government" of the Ministry of Labour's industrial classification are not of great value. A large number of persons employed by Local Public Authorities is not covered by the Unemployment Insurance Scheme and the proportion thus excluded may vary from year to year. Moreover, this industrial group excludes gas, water, electricity, tramway, etc., undertakings carried on by Local Authorities and the classification groups these with similar enterprises in the hands of private undertakings.* The Ministry of Labour statistics may, however, be taken as sufficient evidence that there has been substantial unemployment among Local Authority employees, as Table I below reveals, although it must be borne in mind that those employees covered by the official returns are likely to show a higher rate of unemployment than those excluded.

TABLE I.

Percentage Unemployment among Insured Persons in "Local Government" in the Survey Region.†

	Per cent.		Per cent.
1923	3.6	1929	9.9
1924	5.1	1930	12.9
1927	8.1	1931	15.6

In order to supplement the Ministry of Labour statistics and to ascertain how far the various Local Authorities were increasing in importance as employers of labour, a questionnaire was despatched to each County Borough, Municipal Borough, Urban District and Rural District in the Survey Region asking for details of the numbers of persons employed in each of the years 1921-1930, classified by services. Similar questionnaires were also sent to the Joint Water, Gas and Sewerage Boards in the Region, and

* Thus the number of insured employed persons in the Survey Region in 1930 was 24,302; whilst, in Table II of this chapter, the total number of employees of Local Authorities is shown as 95,977.

† Unemployment average for 1924, 1927, 1929 and 1930 at quarterly dates March, June, September, December. For 1923, June, September, December; for 1931, March, June, September.

information was obtained of the Joint Electricity Boards in operation. Finally, the Lancashire County Council gave comparable information of the numbers of workers employed by it in the whole of the county. In all cases the figures comprise both salary and wage earners.

The returns received, upon which the tables below are based, were not complete. County Boroughs, Municipal Boroughs, Urban Districts and Rural Districts, however, covering about 80 per cent. of the total population of the Survey Region made comparable returns, the percentage being higher for the County Boroughs than for other authorities. Details were received from nine out of twelve Joint Boards. The Lancashire County Council could only provide information for the whole of the county, not for the Survey Region, and no returns were asked for from the Cheshire County Council since it would have been extremely difficult to differentiate between those who could be regarded as employed in that small part of the county which falls within the Survey Region and those employed outside it. In addition, a small number of persons is employed by other authorities, such as parish councils and parish meetings, who were not approached. The information, finally, relates only to one date, usually March 31st in each year. Despite these qualifications, however, the sample is extremely large and can be regarded as representative.

There has, undoubtedly, been a very substantial increase in the numbers employed by Local Authorities in the Survey Region. Table II shows that the expansion was over 20 per cent in the period 1921-1930.

TABLE II.

Total Number of Employees of Local Authorities in Survey Region, 1921-1930.

Year.	County Boroughs.*	Municipal Boroughs.	Urban Districts with more than 20,000 population.	Urban Districts with less than 20,000 population.	Rural Districts.	Joint Gas, Water and Sewerage Boards.†	Lancashire County Council.‡	Total.§	
									1921=100.
1921 ...	61,515	5,527	2,356	1,684	551	—	5,871	77,504	100·0
1922 ...	62,261	5,809	2,372	1,844	562	—	5,974	78,822	101·7
1923 ...	62,384	5,954	2,387	1,860	619	1,116	6,112	80,432	103·8
1924 ...	64,203	6,202	2,540	1,957	580	1,372	6,086	82,920	107·0
1925 ...	65,876	6,369	2,442	2,050	611	1,646	6,091	85,085	109·8
1926 ...	67,673	6,405	2,613	2,116	624	2,828	6,356	88,615	114·3
1927 ...	70,232	6,534	2,647	2,125	654	1,642	6,524	90,358	116·6
1928 ...	70,895	6,712	2,779	2,198	657	1,506	6,645	91,392	117·9
1929 ...	72,830	6,834	2,873	2,215	645	1,506	6,803	93,706	120·9
1930 ...	73,926	6,933	3,124	2,534	638	1,459	7,363	95,977	123·8

* Figures for Rochdale C.B. did not cover the whole period and have been excluded. The number of its employees increased, however, from 2,573 in 1924 to 3,321 in 1930.

† Comprising details of nine such Boards. Joint Hospital Boards were not approached for information. The figures include temporary employees of the Fylde Water Board.

‡ For the whole county. The numbers employed by County Constabulary not included. In 1931 these totalled 2,030.

§ Excluding Joint Gas, Water and Sewerage Boards for 1921 and 1922.

It would not, of course, be legitimate to consider this large increase in employment as a *net* increase in the employment capacity of the Region. Some part of the growth is undoubtedly temporary. Since 1921 many constructional schemes have been carried through by Local Authorities wholly or partly as unemployment relief schemes. In particular, State-aided relief schemes, the great bulk of which would involve an increase in employment by Local Authorities, absorbed a large number of workers between 1929 and 1931.

TABLE III.

*Survey Region.**Numbers Employed under State-Aided Relief Schemes, 1929-1931.*

March.	Schemes approved by the Unemployment Grants Committee.	Schemes approved by the Ministry of Transport.	Total.
1929	774	831	1,605
1930	3,800	3,338	7,138
1931	6,446	3,976	10,422

Whilst there is no information for later months, it is known that these numbers have fallen greatly because of the national policy of economy.

Again, some part of the expansion of the numbers employed by Local Authorities is alternative, and not additional, to that provided by private enterprises. The growth of publicly owned and operated road transport undertakings, the use of direct labour in building projects, and the extension of the activities of Local Authorities into other trading services may in some cases mean no more than the replacement of the private, by the public, employer. How far this movement can go and to what extent the public bodies have replaced, and not supplemented, private enterprise cannot be stated. The policy of public authorities in such matters is obviously governed mainly by political circumstances, and the field for the expansion of public employment of this kind is limited. It may, therefore, be that in the future the rapidity of the increase will be checked or the movement even reversed.

Such qualifications do not shake the general conclusion that public employment has attained very large proportions and has been growing rapidly. In the Survey Region, the number of workers employed by Local Authorities is exceeded only by the numbers employed in three industries—cotton, engineering, and distribution. Local government already* provides a greater amount of employ-

* It is impossible to make an exact comparison since the statistics of employment by Local Authorities cover both salary and wage earners and include workers of all ages, whereas the insured employed statistics now exclude many salaried workers and all persons below 16 or above 65 years of age.

ment than the coalmining, the textile finishing, or the clothing industry. Certainly, developments in public employment of this kind since 1921 have relieved considerably the position in the labour market.

Figures showing the expansion of the different services are given below in Table IV. They are only approximate, for some of the smaller Authorities were not able to classify their employees according to the detailed range of services which was submitted to them and the forms of presentation adopted by the various Authorities created difficulties in the construction of a final table. Table IV, however, covers a large sample under each service and probably records trends accurately even where the returns are incomplete.

TABLE IV.

Number of Persons employed in principal services of certain Local Authorities in the Survey Region.

Year.	Public Health.*	Relief of the Poor.†	Highways and Bridges.‡	Education.§	Housing and Town Planning.**	Water, Gas and Sewerage.††	Electricity. ‡‡	Road Transport.§§
1921	11,368	4,292	5,903	20,735	1,351	—	3,592	12,941
1922	12,584	4,558	5,936	20,673	1,500	—	3,739	12,712
1923	12,006	4,554	6,677	20,406	928	8,645	4,351	12,934
1924	12,035	4,693	6,873	20,492	874	9,516	4,511	13,690
1925	11,929	4,879	6,813	20,665	815	10,229	5,129	14,216
1926	12,300	5,160	7,173	20,846	779	11,704	5,375	14,795
1927	12,576	5,264	7,666	21,037	1,772	10,283	5,838	15,350
1928	12,558	5,142	7,914	21,204	1,719	9,905	6,142	15,811
1929	13,261	5,393	8,106	21,522	1,027	9,794	6,519	16,575
1930	13,251	5,714	8,865	21,858	1,137	9,913	6,836	16,455

* Details for Lancashire County Council, County Boroughs, Municipal Boroughs, Urban Districts and Rural Districts.

† County Boroughs.

‡ Lancashire County Council, County Boroughs, Municipal Boroughs, Urban Districts and Rural Districts.

§ Lancashire County Council, County Boroughs, Municipal Boroughs and certain Urban Districts with over 20,000 persons which are local elementary education authorities.

** County Boroughs and Municipal Boroughs.

†† County Boroughs and Joint Boards.

‡‡ County Boroughs, Municipal Boroughs, Urban Districts and Joint Boards.

§§ County Boroughs and Municipal Boroughs.

With the exception of "Housing and Town Planning" all the services show an increase in employment. The most rapid percentage increases are in "Electricity", where the numbers have doubled; in "Highways and Bridges", where relief work of many kinds has undoubtedly helped to swell the numbers; and in "Road Transport". Comments upon the course of employment in the different services follow.

1. In Road Transport the expansion appears even if tram and 'bus services are grouped together. It was, unfortunately, impossible to distinguish between these two in all cases. The salaried workers are often engaged in the joint running of both services. In certain instances, however, separate figures are available for wage-earners and they make quite clear the remarkable expansion in 'bus services run by Local Authorities and the tendency for the number of employees on tramway services to be reduced.

TABLE V.

*Number of Wage-Earning Employees in Tram and 'Bus Services.**

<i>Year.</i>	<i>Tram.</i>	<i>Omnibus.</i>
1921	10,548	41
1922	10,289	66
1923	10,638	90
1924	11,134	142
1925	11,419	372
1926	11,878	503
1927	12,017	869
1928	12,061	1,156
1929	12,205	1,731
1930	11,825	2,084

2. The figures for the Relief of the Poor, Table IV (Col. 2), are incomplete. In making their returns the County Boroughs included figures under Relief of the Poor although they were not administering poor relief until after March 31st, 1930. Movements in the total numbers of Board of Guardian employees between 1921 and 1929 probably correspond with the movements indicated by the returns made by the County Boroughs. But the figures given for the years 1921 to 1929 do not include the employees of Boards of Guardians in the less densely populated parts of the area, nor does the figure for the year 1930 include the employees of the County Council. For what they are worth, however, the figures show an increase of employment in this service. It is possible that from 1930 onwards employment by the County Boroughs in respect of this service will (apart from temporary counteracting causes, such as the administration of Public Assistance) show a decline, since the assignment of certain functions, formerly exercised by Boards of Guardians, to the Public Health, Education and other Departments of the County Boroughs may result in administrative economies of a permanent character.

* Details relate to eight County Boroughs and seven Municipal Boroughs.

3. Some of the returns rendered by the County Boroughs, and those non-County Boroughs which maintain their own police force, include figures for police among "additional employees", others give these figures by themselves, others give them in combination with other classes of specialised workers. All the County Boroughs in the Survey Region, with the exception of Bury, maintain police forces of their own, as well as the non-County Boroughs of Accrington, Ashton-under-Lyne, Bacup, Clitheroe and Lancaster. Other areas are policed by the County. The Lancashire County Council did not, however, furnish a return of the County Police Force. The reason doubtless was that the County police are nowhere employed by the County Council but by the Standing Joint Committee. The Lancashire Standing Joint Committee employs at present 2,030 persons. As the County expenditure on police rose from £775,000 in 1921 to about £852,500 in 1928-29 it is probable that the numbers employed have risen since 1921. The County Borough figures when distinguishable show very small increments between 1921 and 1930—a fact which is somewhat surprising in view of the enormous growth of motor traffic and the resulting additional work thrown on the police forces in regulating traffic.

4. Financial assistance out of central funds has taken quite a different form, and has been made available on a much more generous scale, for Highway Authorities, including County Councils, than for any other service, with the possible exception of Education. Such reorganisation as has taken place occurred in the years immediately preceding our period, i.e., in 1919 and 1920—e.g., under the Ministry of Transport Act, the Road Act, and the Finance Act of 1920. As far as the highway functions of Local Authorities are concerned re-organisation only commenced on April 1st, 1930, when the appropriate sections of the Local Government Act, 1929 (Sections 29 to 39), came into force. The marked upward tendency shown by the figures of employment in this service, set out in Col. 3 of Table IV, is due to the financial encouragement given to Local Authorities partly by the Ministry of Transport out of the Road Fund, partly by the Unemployment Grants Committee out of moneys voted by Parliament annually.

In regard to the assistance afforded generally to Local Authorities in the Survey Region by the Unemployment Grants Committee, figures regarding numbers employed on assisted schemes are not available except for the years 1929, 1930 and 1931.* It is probable, however, that, during each of the years 1921 to 1926 inclusive, the Unemployment Grants Committee was giving substantial assistance to road works as well as to other works of Local Authorities with a view to the relief of unemployment. The following table shows

* See p. 271.

the estimated cost of Local Authority schemes of all sorts assisted by the Unemployment Grants Committee for England and Wales.

	£		£
1921-22	21,412,793	1926-27	3,490,324
1922-23	14,794,808	1927-28	1,614,409
1923-24	22,405,230	1928-29	3,045,240
1924-25	20,197,458	1929-30	31,868,304
1925-26	16,399,275	1930-31	38,793,000

On April 1st, 1926, the outstanding liabilities of the Committee in respect of Road and Bridge Works were transferred to the Road Fund. Between 1926 and 1928 the Committee made no further grants to Local Authorities in respect of Road and Bridge Works. This cessation accounts in part, though not entirely, for the considerable reduction in the number and cost of schemes assisted during the years 1926-1928. A more important factor was a change of policy made by the Committee in December 1925. This policy was to approve for grant only those public utility undertakings which were to be put in hand out of course and which otherwise would not be likely to be undertaken for five years and only if such undertakings were in areas where unemployment was exceptional. A new and more liberal policy was, however, inaugurated by the Committee on November 9th, 1928, the object of which was to give special relief to depressed areas by drawing off some of the surplus unemployed to other areas. About the same time the Committee announced that it was prepared to make grants towards works on unclassified roads to which the Ministry of Transport was not making grants out of the Road Fund.

The following statement compiled from the Annual Reports on the Road Fund issued by the Ministry of Transport indicates the substantial assistance which has been rendered by the Road Fund to the larger Local Authorities in the Survey Region between 1923-24 and 1930-31.

TABLE VI.

Grants made out of the Road Fund to (I) the Lancashire County Council (the whole County area) and (II) the County Boroughs in the Survey Region, (a) to expedite works to relieve unemployment; (b) for all highway purposes including (a); and (c) the percentage borne by (a) to (b).

I. LANCASHIRE COUNTY COUNCIL.				II. THE COUNTY BOROUGHS OF THE SURVEY REGION.			
Year.	Unemployment Relief Grants.	Total Grants.	Percentage.	Year.	Unemployment Relief Grants.	Total Grants.	Percentage.
	£	£			£	£	
1923-4 ...	279,922	694,395	40·3	1923-4 ...	177,336	350,709	50·6
1924-5 ...	169,842	711,059	23·9	1924-5 ...	205,407	337,884	60·8
1925-6 ...	52,815	604,059	8·7	1925-6 ...	134,922	313,714	43·0
1926-7 ...	72,643	771,192	9·4	1926-7 ...	65,500	273,915	23·9
1927-8 ...	15,222	735,618	2·0	1927-8 ...	2,289	241,784	0·9
1928-9 ...	14,641	811,516	1·8	1928-9 ...	—	184,954	—
1929-30 ...	123,762	1,194,131	10·4	1929-30 ...	123,967	392,687	31·6
1930-31* ...	605,017	1,262,862	47·9	1930-31* ...	251,423	318,266	79·0

* As a result of the coming into operation of the Local Government Act, 1929, on April 1st, 1930, the total grant figures in the case of the 14 County Boroughs must be augmented by a sum of more than £217,000, for this sum (together with certain additions) represents the amount made available to the 14 County Boroughs for the maintenance of Class I and Class II roads in their areas through the General Exchequer Contribution (the Block Grant). In the case of the Lancashire County Council the increase in total grants is due doubtless to increased expenditure by the County Council as the result of the transfer to it of responsibility for Classified Roads in the County area together with all other roads in Rural Districts.

5. The figures given in Col. 5 of Table IV relate only to labour employed directly on housing by Local Authorities. They represent only a small proportion of the labour engaged on the State-assisted housing schemes of the Local Authorities in the Survey Region. The fluctuations shown in these figures reflect some of the general tendencies by which building labour, employed on State-assisted schemes, was affected in the Region. Thus, the increase of 900 between March 1926 and March 1927 is attributable partly to the fall in the price of houses, but mainly to the announcement in October 1926 by the Minister of Health that the subsidy for houses under the 1923 Subsidy Act would be reduced from £9 to £6 and the subsidy for houses under the 1924 Subsidy Act from £9 per house to £7 10s. as from September 30th, 1927 (for all houses not completed by that date). This intimation had the effect in Lancashire as elsewhere of accelerating work on houses which had been approved or commenced.

The average price of the non-parlour type of house fell from £448 in October 1927 to £368 in March 1928. This fall may have induced the Minister to announce on December 6th, 1928, that the subsidy under the 1923 (Chamberlain) Act would be withdrawn altogether as from September 30th, 1929, and that the subsidy under the 1924 (Wheatley) Act would be reduced on the same date by a further £1 10s. This intimation again had the effect of accelerating progress on Chamberlain subsidy houses. The further cut in the Wheatley subsidy (from £7 10s. to £6) was not, however, made, since in July 1929 an Act was passed (the Housing, Revision of Contributions, Act) maintaining the £7 10s. subsidy in force. On account of these changes in policy great progress was made on State-assisted schemes in the Region both in 1927 and 1928.

CHAPTER 14.

LOCAL RATES AND INDUSTRY.

The form which discussions on local rates and industry often take makes one or two preliminary observations necessary. The first relates to the frequent use of the term "burden" as applied to local rates. If the use of the term is meant to imply that local rates represent a payment for which industry receives no return, then it is clearly erroneous. No one is likely to deny that a number of the functions of Local Authorities are directly beneficial to industry, e.g., Police, Fire Brigades, Roads and Bridges, etc. Even as regards the other services, where the benefit is more indirect and less measurable, it cannot be said that industry receives no benefit from them. The test of benefit received should be, whether, if the service were not provided, its absence would entail any handicap to industry by either directly or indirectly increasing its costs. If, however, "burden" refers to the method of levying local rates, then there is evidence to support the conclusion that certain irritating factors often cause local rates to be burdensome. These are referred to later.

Secondly, the statement that the expenditure of Local Authorities has considerably increased since 1914 often leads to the mistaken impression that the increase is unwarranted. Factors such as the higher price level, new services and increasing population must, of course, be taken into account. Even apart from these factors, however, a true comparison can only be made with 1914 if that year represented a suitable standard as regards local services.

Local rates have two characteristics which make a study of their effects on industry more necessary than in the case of national taxation. The first is that rates enter into the cost of production. Rates are payable whether a profit is earned or not; they therefore form part of the fixed costs which must be allowed for in the price. The second is that rates vary, often considerably, between different areas. These two characteristics point to two corresponding lines of approach in studying the effect of local rates on industry, viz. :—

- (1) The extent to which rates enter into the cost of production and selling price.
- (2) Their possible effect on the localization of industry.

I.—Local Rates in relation to Cost of Production and Selling Price.

The relationship between local rates and the selling price of industrial products has been the subject of much general enquiry and discussion. The chief study is that made by the Balfour Committee on Industry and Trade.* It is the purpose of this section to show as far as possible this relationship in the Survey Region and to estimate the extent to which the position has been changed by recent legislation.

Before attempting to show the results of such legislation, it is desirable to state the position before the changes. The Balfour Committee's latest figures refer chiefly to 1924. Table I, based on figures found in that report, gives some idea of the relationship between local rates and cost of production for some specimen firms.

TABLE I.

<i>Trade of Concerns.</i>	<i>Percentage of Rates to total cost, 1924.</i>
Engineering	Varied between 0·37 and 2·0 per cent.
Cotton Weaving—	
A	0·19
B	0·28
Boots and Shoes	0·58
Hosiery	Varied between 0·23 and 0·49 per cent.
Dyes	2·20
Coal†	2·14

* Factors in Industrial and Commercial Efficiency Part 1, p. 479 et seq.

† The figures for Coal refer to the period May–July, 1925. The cumulative effect (from coal and ore to finished product) of rates expressed as a percentage of average quoted prices for Tinslates (I.C. 20 in. × 14 in.) was 1·33 per cent. and 3·03 per cent. for Steel Rails (Heavy).

It must be noted that the percentages quoted above will now have been considerably reduced by changes in the Law of Rating. If allowance is made for the fall in prices and output, the percentages will now probably be at most one-third of the 1924 figures.

Table II gives the results of an enquiry which was undertaken among firms in the Survey Region designed to show the existing incidence of local rates and the changes which have been produced by derating.

TABLE II.*

Local Rates Expressed as a Percentage of the Selling Price of Production during the Year.

<i>Trade of Concern.</i>	<i>1927.</i>	<i>1930.</i>
	<i>per cent.</i>	<i>per cent.</i>
<i>Spinning—</i>		
A	0·85	0·24
B	0·87	0·27
C	0·45	0·11
D	0·62	0·36
E	1·36	0·57
F	0·49	0·15
<i>Weaving—</i>		
A	0·26	0·07
B	0·27	0·20
C	0·31	0·12
D	0·38	0·14
E	0·40	0·23
F	0·34	0·07
G	0·29	0·05
Biscuit	0·72	0·14
Preserves	0·48	0·15
Soap	0·34	0·10
Flour	0·18	0·04
Printing	0·57	0·10
Engineers	0·50	0·08
Motor	0·17	0·02
Textile Machinists	0·72	0·62
Wire	0·73	0·18

The following figures were also obtained for the coalmining industry in Lancashire and Cheshire.

TABLE III.

<i>Period.</i>	<i>Local Rates per ton of Coal Commercially Disposable.</i>
April–December, 1927	2·65d.
Year 1928	3·61d.
January–September, 1929	3·62d.
Year 1930	0·82d.

* Certain qualifications attach to statistics of this kind. The percentages given obviously do not represent the total incidence of local rates on the cost of production but merely their incidence at one stage of manufacture. See on this and other qualifications, Balfour Committee Report "Factors in Industrial and Commercial Efficiency," p. 480 et seq.

Differences in the percentage of rates paid to the total value of production may be due to a number of causes. Within the same industry small differences are likely to be due to the firms being in different areas. Larger differences are more probably due to firms working different amounts of short time. Variations between industries may be also due to the comparative size of premises required in relation to value of output.

II.—The Relief of Industry. 1925-30.

Within recent years industry has been relieved of local rates in two ways :—

A.—*Non-Rateability of Machinery.*

The Rating and Valuation Act, 1925, made certain types of machinery not rateable as from the making of the new valuation list. Four large classes of machinery and plant are, however, still rateable,* viz. :—

(1) Machinery and Plant (with appliances and accessories) used or intended to be used mainly or exclusively in connection with :—

(a) the generation, storage, primary transformation or main transmission of power in or on the hereditament :

(b) the heating, cooling, ventilating, lighting, draining or supplying of water to the land or buildings of which the hereditament consists, or the protecting of the hereditament from fire :

(2) Lifts or elevators mainly or usually used for passengers :

(3) Railway and Tramway lines and tracks :

(4) Certain types of machinery and plant which are in the nature of building or structure.

It is difficult for two reasons to estimate with any degree of accuracy the amount of relief given by this Act. (a) It coincided with a general re-valuation which obscures the relief granted in the case of machinery. (b) Before the passing of the Act, machinery had been treated for rating purposes in various ways ranging from a nominal to a full assessment.

Some idea of the relief given to various works is indicated by Table IV based on actual particulars of concerns in the Survey Region.

* See Statutory Rules and Orders, 1927, No. 480, for complete particulars.

TABLE IV.

Works.	Reduction in Valuation due to Omission of Machinery.*	Reduction as percentage of Full Valuation.	Reduction of Rates.	Relation of Reduction to Selling Price of Production.	
	£	Per cent.	£	Per cent.	Pence per £.
Biscuit ...	623	12·6	405	0·077	0·185
Flour ...	3,953	36·9	2,174	0·081	0·194
Wire ...	1,156	12·2	857	0·098	0·235
Weaving ...	217	20·2	120	0·071	0·170
Printing ...	1,199	30·9	779	0·166	0·398

* The figures shown in this column may possibly be slightly affected by other factors causing a reduction in valuation.

It will be seen from Table IV that the percentage reduction in assessment varies. Similarly the relief from rates also varies, and while the relief expressed in terms of pence per £ of output seems so small as not to affect appreciably the selling price, the total relief is not inconsiderable, especially as it is a reduction in fixed costs. It must be borne in mind, however, that where the premises have been derated then the relief specifically due to the non-rateability of machinery is reduced by 75 per cent.

B.—Derating.

The second mode of relief was by Derating. The Local Government Act, 1929 granted relief in respect of three classes of property : 1. Agricultural Hereditaments. 2. Industrial Hereditaments. 3. Freight Transport Hereditaments.

Agricultural Hereditaments.—The relief granted to agricultural land and buildings was one-quarter. Previously, however, this class had been derated to the extent of three quarters, hence from April 1st, 1929, agricultural land and buildings have paid no rates. Rates are however, still payable on farmhouses. The estimated amount of rates levied on agricultural land by all Local Authorities in Lancashire in 1927/28 was £148,919. It is not possible to estimate accurately the figure for agricultural buildings. The total of the actual grants made by the Government to the Local Authorities in the area to cover loss of rates due to this relief was £152,725 for the year ending 31st March, 1930—this figure being subject to amendment in respect of outstanding valuation appeals, etc.

Industrial Hereditaments.—From 1st October, 1929, this class was relieved of rates to the extent of 75 per cent. The interpretation of the term "Industrial Hereditament" has caused much difficulty. It is defined as "a hereditament occupied and used as a

mine or mineral railway" or "as a factory or workshop". Section 3 of the Rating and Valuation (Apportionment) Act, 1928, however, expressly excludes any workshop or factory which is primarily used and occupied for any of the following purposes:—

- (a) A dwelling house;
- (b) A retail shop;
- (c) Distributive wholesale business;
- (d) Storage;
- (e) A public supply undertaking.

Both prosperous and depressed industries benefit by the relief. For instance, in Lancashire, breweries will benefit to the extent of about £45,000 per annum. The litigation already disposed of by the House of Lords shows interesting results. Derating has been refused to a cable testing works, and a cold storage premises but granted to a beer bottling stores. Another example showing how artificial distinctions can be created by the wording of the Act is the case of packing premises; derating has been allowed where the premises are used solely for packing, but where the premises are used as part of a shipping warehouse the Revenue Officer is objecting to the Derating allowance being granted. This case, which has arisen in Manchester, is still under consideration.

A further point which has arisen (especially in connection with cotton mills) is the position when a factory closes down. It is not sufficient for a factory to be occupied; it must also be used as a factory in order to secure Derating relief. Therefore, where a factory closes down, if no other factor enters into the case, the rates payable will be four times as much as when the factory was in use. This difficulty is, however, met in some instances by placing a reduced "storage" or "silent" value on the mill* or factory. Nevertheless, in some cases the rates payable on this reduced value are still above what would be payable if the factory were being used.

To Lancashire this Industrial Derating Relief of 75 per cent. is, of course, the most important of the three classes of relief. Its precise effect is difficult to estimate, but the following calculations give an approximate figure. In 1927/28 it was estimated that this class of rateable property accounted for £3,667,063 out of £23,089,195 of rates levied in Lancashire, or 15.88 per cent. of the total. The £3,667,063 was allocated as follows:—

	£
Mines and Quarries	175,173
Steel and Iron Works, Blast Furnaces and Smelting Works ...	263,139
Ship-Building and Ship-Repairing Works	46,787
Breweries and Distilleries	62,745
Mills and Manufactories, Chemical Works, etc.	3,119,219
	3,667,063

* The position as regards cotton mills is still in dispute.

An allowance of 75 per cent. of this sum would amount to about £2,750,000 but it has also to be borne in mind that since 1927/28 the assessments will have been much reduced by the taking out of rating of a large amount of hitherto rateable machinery. It is probably safe to assume, however, that the amount of rates levied on Works, Factories, and Mines in Lancashire is about £1,000,000* per annum, or approximately 5 per cent. of the total rates raised in the area. If this figure is approximately correct it would imply a total amount in Derating Relief of about £2,500,000, and the relief afforded to various industries will probably be of the following order of magnitude:—

	£
Coal... ..	115,000
Steel and Iron	180,000
Sh'pbuilding and Repairing	30,000
Breweries	45,000
Cotton Spinning and Weaving	1,400,000
All other industries†	730,000
	2,500,000

Table II has already given an indication of how far Derating has reduced the rates for particular firms. Examining the results more closely the conclusion is reached that in those industries which most urgently needed relief the beneficial effect has been to a large extent offset by decreased production and falling prices, although this is rather obscured by the reduction in the assessments after the 1929 re-valuations. Figures obtained from five weaving firms in the Survey Region bring this point out clearly. The selling price of the total production of these firms fell from £1,035,011 in 1927 to £643,812 in 1930. The percentage of rates to selling price in 1927 was 0.32, or roughly 1 per cent. of the conversion costs. Had production and prices remained constant between 1927 and 1930, Derating would have caused these percentages to fall to 0.08 and 0.25 respectively. The fall in the total value of the output, partly due to a reduction in physical output and partly to a fall in prices, however, offset to some extent the Derating allowance and the resulting percentages for 1930 were 0.13 and 0.4.

Whilst the small size of the sample makes it impossible to generalise, one case of which we had details suggests that the relief granted by Derating involved some inconsistency. The case was that of a motor manufacturer. In 1927 the rates expressed as a percentage of the selling price was 0.165 per cent. Owing to the

* This figure does not include rates payable on Warehouses or on Offices, where these are assessed apart from the Factory. In 1927 it was estimated that the rates levied in Lancashire on warehouses separately assessed was £1,127,120. No separate figures are available for the rates payable on Offices but in Manchester this is approximately £425,000.

† Does not include Railways or Public Utility Undertakings.

double effect of Derating and increasing output this fell to 0.0224 per cent. in 1930. In other words, the rates on a £200 car were reduced from 6s. 7d. to 11d.—a reduction which can hardly have had any effect on the selling price of the car and which in any case must be offset by the recent policy of regarding the motor industry as a luxury industry and taxing it in a number of ways.

Freight Transport Hereditaments.—Relief from Local Rates to the extent of 75 per cent. dating from 1st October, 1929, was granted to this class. The relief, however, unlike the relief to other hereditaments, was granted on the consideration that it should be passed on to industry in the form of reduced freight charges.

For the railways the traffic charges to be so reduced were indicated. These selected traffics were broadly :—

- (1) Agricultural (chiefly Manures, Food, Potatoes, Milk, and Livestock).
- (2) Coal, Coke, and Patent Fuel (but only if for export or for use in Iron and Steel works).
- (3) Timber, Iron, and Steel, for mine propping purposes, and certain Ores and Lime and Limestone for use in Iron and Steel Works.

While Derating only came into force from 1st October, 1929, there was a preliminary scheme under which the freight reliefs were granted from 1st December, 1928. The effect on freight charges has been appreciable. The percentage rebate has been increased twice since 1928; from 1st December, 1931, it is as follows :—

Items in Class (2) above.

1½d. per ton and 30 per cent. of the remaining carriage charges, or where the carriage charge is a toll, 35 per cent. thereof.

Items in Class (3) above.—17½ per cent. of the carriage charges.

In respect of coal traffics, carriage charges exclude wagon hire. For all traffics, payments in respect of collection and delivery are excluded from the relief.

Owing to the great variety of railway charges it is impossible to state what is the general relief per ton of coal. In the case of coal sent from Golborne to Wyre Dock, Fleetwood, for shipment, the rebate was equal to 1s. 1d. per ton. Coal sent between Atherton and Wigan for use in iron and steel works shows a rebate equal to 4.3d. per ton—in this case, however, the owners' wagon rate was 11d. per ton as against 3s. 4d. per ton in the former example.

No figures are available to show the total amount by which Lancashire has benefited. The class of traffic selected, however, cannot be very large, since neither the iron and steel industry nor the coal exporting trade is large in the Area.

III.—Local Rates and the Localization of Industry.

* A statement is sometimes made that the high rates payable in the Lancashire area tend to drive industries to other areas. The truth seems to depend on whether industry in Lancashire has to bear a heavier amount of local rates than in other localities, and whether this difference is an appreciable amount in the cost of production.

Table V gives the frequencies of certain rate poundages levied in Urban Areas* in (a) The Survey Region; (b) London and the Administrative Counties of Berkshire, Buckingham, Essex, Herts, Kent, Middlesex, Oxford, Surrey and Southampton; and (c) England and Wales.

TABLE V.

Poundage Rate in 1930-31.	Number of Urban Areas in which the Poundage Rates were within the limits indicated in column 1 expressed as a percentage of the total Urban Areas in the locality.			
	1	2. Survey Region. Per cent.	3. London and Surrounding Counties. Per cent.	4. England and Wales. Per cent.
Under 10s.		7.6	21.2	9.5
10s. and under 12s.		36.2	43.5	27.9
12s. " 14s.		39.0	23.2	30.5
14s. " 16s.		14.3	9.3	19.2
16s. " 18s.		2.9	2.0	7.3
18s. " 20s.		—	0.8	3.1
20s. and over		—	—	2.5
		100.0	100.0	100.0

It will be seen that for the London and surrounding counties, 21.2 per cent. of Urban Local Authorities levied a rate of less than 10s. in the £, whilst in the Survey Region the corresponding figure was only 7.6 per cent.—this percentage being even below that for all urban areas in England and Wales. The Survey Region also compares unfavourably with the London Area throughout the range of rate poundage.

The rate poundage is not, however, a strict basis of comparison in considering the rates paid in different areas. It is only so if

* Rural Areas are excluded because additional special rates are generally levied in particular parishes, a factor which makes a comparison based on the general rate poundage misleading.

the level of valuation is similar. A difference in the level of valuation between two areas may be due to two causes :—

(1) Different standards of valuing. This was particularly important before the Rating and Valuation Act, 1925. The hierarchy of Valuation Committees set up under that Act has gone far in securing a uniformity of valuations between different areas.

(2) Differential advantage of one situation over another. This question of situation renders it very difficult to compare buildings in two areas. Even if the buildings are identical, the situation of one building may be such as to give it a higher rateable value. In connection with the value of the site it must be remembered that the amount of rates payable may have the effect of reducing the value of the site, and in so far as this is true the rates and rental cannot be clearly separated. The vexed question of the incidence of local rates must therefore be taken into account when comparing the rates payable by industry in different areas.

The extent of differences in rates between two areas can only be discussed by assuming (a) that the general level of valuation in the two areas is the same, and (b) that the difference is not borne by the landowner.

In Table VI below an attempt has been made to give some quantitative estimate of the effects upon selling price of the transfer of a concern from an area where the rates are levied at 15s. in the £ to one where the rates are levied at 10s. in the £. Given the reservations above, this would roughly correspond to a case where a firm moved from a highly rated area in Lancashire to a normally rated area in the London District, and in the table below details are given for firms of a type which might be, and are, found in all parts of the country. The method of construction of this table was as follows: From actual details of production, assessments, etc., supplied by six firms in the Survey Region the percentage which rates paid would bear to the total value of output was deduced at the two rate poundages and for two years, one preceding and one following Derating.

TABLE VI.

Percentage of Rates to Total Selling Price of Production, based on particulars furnished to the Survey.*

Trade.	Before Derating and Unrating of Machinery.				After Derating and Unrating of Machinery.			
	Percentage of Rates to Value of Output.		Difference.		Percentage of Rates to Value of Output.		Difference.	
	Rates Levied at 15s. in the £. Per cent.	Rates Levied at 10s. in the £. Per cent.	Per cent.	Expressed as pence per £ of selling price. d.	Rates Levied at 15s. in the £. Per cent.	Rates Levied at 10s. in the £. Per cent.	Per cent.	Expressed as pence per £ of selling price. d.
Biscuit Works	0·71	0·47	0·24	0·576	0·15	0·10	0·05	0·120
Motor Works	0·12	0·08	0·04	0·096	0·03	0·02	0·01	0·024
Flour Mill	0·34	0·23	0·11	0·264	0·06	0·04	0·02	0·048
Printing Works	0·63	0·42	0·21	0·504	0·11	0·07	0·04	0·096
Soap Works	0·53	0·35	0·18	0·432	0·13	0·09	0·04	0·096
Preserve Works	0·59	0·40	0·19	0·456	0·15	0·10	0·05	0·120

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* The 1930 production figures have been used in every case.

This method of comparison is based on assumed simplified conditions. But it indicates that, at least as regards the works included, the gain from the movement to the lower-rated area appears to be very small. After Derating, the gain from the transfer was never more than one-eighth of a penny per £ of the total selling value of the product and in most cases it was even less. It seems difficult to believe that factors of this order of importance could influence those choosing sites for new plants.

IV.—The Rating System and Industry.

Rates are heavier in periods of depression than in periods of prosperity. In a period of depression three forces are at work tending to cause this increase in rate charge.

(1) The increasing cost of Local Government Services.—This is chiefly due to the placing of the whole burden of Public Assistance on the Local Authority. The amount of "Out Relief" granted in the Lancashire area in 1928-29 was £1,914,243, or nearly six times as much as in 1920. This means that the Mills, Mines and Works in Lancashire paid roughly £250,000 more in rates in 1928 because of this factor alone. This large increase in Out Relief has been an increasingly unmanageable factor in Local Government Finance. In 1920, out of the 14 County Boroughs in the Survey Region, only in 4 cases did the percentage of revenue raised for Poor Relief (now Public Assistance) purposes exceed 15 per cent. of the total revenue raised. In 1928-29, however, 11 out of the 14 exceeded this percentage and in 5 cases over 20 per cent. of the local revenue went for the relief of the poor.

The New Block Grant based on the formulæ in the Local Government Act, 1929, does not materially improve this position. Lancashire as a whole has, indeed, gained. Provisional figures show this gain to be £585,000 for the whole county. The extra grant has not, however, always gone to the most afflicted areas. Southport will receive more of the extra grant than Blackburn, Oldham, St. Helens and Salford, where the percentage of total revenue spent on Public Assistance is considerable.

(2) The position is further aggravated by the shrinking rate basis due to the increasing amount of empty property, for where property is not beneficially occupied no rates are payable.

A study of 8* County Boroughs in the Survey Region throws light on this point.

* Burnley, Blackburn, Manchester, Preston, Rochdale, Salford, Stockport, Warrington.

TABLE VII.

	1920.	1930.†	Percentage Increase.
	£	£	
Total Rateable Value	9,096,814	12,422,821	36·5
Total amount allowed on empty property.	64,741	268,079	314·1
Empty allowance translated into terms of Rateable Value‡ (i.e., empty allowance divided by rate poundage).	79,757	383,862	381·3
Percentage of Estimated Rateable Value empty to total Rateable Value.	per cent. 0·88	per cent. 3·09	—

† Unreduced rateable value used for basis of comparison.

‡ This figure must necessarily be approximate.

These figures are in themselves sufficient to show the shrinkage in the rate basis due to empty property. In 1920 the yields* of a 10s. rate after making allowance for loss of rates through empty property would be £4,508,528. To raise a similar amount in 1930 (assuming that the increase in rateable value was only sufficient to cover increased expenditure) it would have been necessary to levy a rate of 10s. 4.3d. Therefore a manufacturer whose works were rated at £1,000 would have had to pay £17 18s. 4d. more in rates in 1930 than in 1920, and this increase would not reflect any general increase in expenditure by the Local Authority. The extra £17 18s. 4d. will only be a very small percentage of total costs, but it is rather in the light of the irritation caused that the troublesome nature of the increase must be regarded.

(3) The third force at work is the general decrease in the total value of industrial production due to a combination of decreasing volume of production and falling prices. Rates, generally speaking, are a fixed charge, the amount payable in any one year not varying according to profits earned or income received. In certain cases, the method of arriving at the rateable value does take into account earning capacity. This applies chiefly to special properties, e.g., public utility undertakings, the rateable value of which is computed on a receipts and expenditure basis; licensed premises, theatres, etc., which are also computed on an earning basis; and mines and quarries, the output of which is an important factor in the assessment. The assessments of cotton mills have tended to fall during the last few years as the result of the general lack of demand for such properties. Usually, however, assessments maintain a constant level whether a factory is earning large or small

* Arrears, etc., not taken into account.

profits. A uniform reduction of assessments, total expenditure remaining constant, does not affect the amount of rates payable by any ratepayer but merely produces an increased rate poundage. The following example shows clearly the effect of falling prices on the relationship between rates and selling price. The figures relate to 11 grocery shops in the Survey Region. The reduced sales are due to falling prices and not to a decrease in quantity sold.

	1925-26.	1930-31.
Total Sales	£110,692	£85,108
Total Rates Payable	£454.3	£512
Percentage of Rates to Sales	0.41	0.60
Percentage of 1925-6 Rates to 1930-31 Sales = 0.54 per cent.		
" " 1930-31 " 1925-26 " = 0.46 per cent.		

Clearly, then, in this example the falling price level was a greater factor in increasing the percentage of Rates to Sales than the actual increase in Rates payable.

An example showing the effect of decreased output in increasing the incidence of local rates on cost of production can be given by utilising figures from the Balfour Report.

	Cost of local rates per ton of crucible steel.		Increase per ton.	
	1914. s. d.	1924. s. d.	s. d.	per cent.
Working at full capacity	2 10	6 8	3 10	135.3
Actual output	3 0	21 0	18 0	600.0

In 1914 the factory was working at 95.5 per cent. of its capacity, but only at one-third capacity in 1924. In this example, the increase in the cost of local rates per ton was due more to decreased output than to an actual increase in rates payable. The two examples quoted are possibly exaggerated instances, but they serve to bring out forcibly the point in question.

V.—Conclusions.

1. The Lancashire Industrial Area has benefited greatly from the various measures of rating relief which have been applied in the past few years. The Derating Relief to industry and mining must have been in the neighbourhood of £2,500,000, and other minor forms of relief probably increase this total. The full benefit of the decreased charge has not been felt, however, because of the general decline in production in 1930-31.

2. The incidence of local rates upon cost of production, at any given stage, in industrial manufacture, was slight even before Derating. Of a sample of 22 concerns in various industries in

the Survey Region only one in 1927 showed local rates as more than 1 per cent. of total selling price of the product and in this case the plant was running well below full capacity. Many of the other concerns providing details showed very much lower percentages. Whilst the *cumulative* incidence of rates on (say) a yard of cloth or a textile machine would undoubtedly be much higher than this, it seems clear that, except where the burden of the rates is intensified by short time running of the plant, there is a tendency to exaggerate the part played by rates in increasing costs and prices. This is especially true since Derating for, in 1930, the highest percentage shown among the 22 firms was .62.

3. It has been found impossible to determine, beyond the bounds of doubt, what disadvantage Lancashire suffers in respect of rates, in relation to an expanding industrial area such as that found in the South-East of England. It appears, however, that, if this is a factor in industrial localization, it is one the power of which has been exaggerated. Since Derating, the evidence suggests that the advantages of a plant in S.E. England, from the point of view of the incidence of local rates, are very small, and it is hard to believe that the localization of industry is determined by a process which is so finely adjusted to such minute differences in cost.

4. The method of raising local revenue has certain weaknesses which act as irritants and are especially apparent in times of depression. Apart from any expenditure by Local Authorities on new services the amount of rates payable by a concern tends to increase in bad times because of (a) the large increase in Public Assistance out relief and (b) the reduction in the rate yield due to the non-payment of rates on empty property. Both these factors have operated strongly in the last decade in the Survey Region.

APPENDIX I.

TABLE I.—*Population of Lancashire and England and Wales. 1801-1931.*

Year.	Lancashire.			England and Wales.			Percentage of Population in Lancashire.
	Population.	Intercensal Increase.		Population.	Intercensal Increase.		
		Number.	Per cent.		Number.	Per cent.	
1801	673,486	—	—	8,892,536	—	—	7·6
1811	828,499	155,013	23·0	10,164,256	1,271,720	14·30	8·2
1821	1,052,948	224,449	27·1	12,000,236	1,835,980	18·06	8·8
1831	1,336,854	283,906	27·0	13,895,797	1,896,561	15·80	9·6
1841	1,667,054	330,200	24·7	15,914,148	2,017,351	14·52	10·5
1851	2,031,236	364,182	21·8	17,927,609	2,013,461	12·65	11·3
1861	2,429,440	398,204	19·6	20,066,224	2,138,615	11·90	12·1
1871	2,819,495	390,055	16·1	22,712,266	2,645,042	13·13	12·4
1881	3,454,438	634,943	22·5	25,974,439	3,282,173	14·45	13·3
1891	3,926,760	472,322	13·7	29,002,525	3,028,086	11·65	13·54
1901*	4,406,409	479,649	12·2	32,527,843	3,525,318	12·17	13·55
1901†	4,368,989	—	—	—	—	—	—
1911	4,756,644	387,655	8·9	36,070,492	3,542,649	10·9	13·2
1921	4,927,484	170,840	3·6	37,886,692	1,816,207	5·04	13·0
1931	5,039,097	106,146	2·2	39,947,931	2,061,232	5·4	12·6

* Ancient County.

† Administrative County.

The figures for 1801-1901 are from the Census of 1911 (Summary Tables, p. 3): they relate to the Parliamentary Counties as constituted in 1885. Those for 1911 and 1921 are taken from the Census of 1921 (General Tables, p. 3): they refer to the Administrative Counties.

TABLE II.—*Intercensal Increases in the Population of Lancashire. 1851-1921. Net Gain or Loss by Migration, and Percentage of Increase due to Migration.*

Year.	Intercensal Increase.	Estimated Excess of Births over Deaths.	Gain or Loss by Migration.	Percentage of Migration to Net Increase.
1851-61 ...	398,065	254,178	143,887	36
1861-71 ...	383,893	287,961	95,932	25
1871-81 ...	636,560	418,798	217,762	34
1881-91 ...	472,087	448,538	23,549	5
1891-1901 ...	477,368	436,417	40,951	9
1901-11 ...	387,655	484,762	— 97,107	— 25
1911-21 ...	170,840	334,046	— 163,206	— 96

The intercensal increases shown in this table have been obtained from the returns of each successive Census. Because of changes in the county boundaries they show divergencies from those in Table I.

TABLE III.—*Distribution of Population within the Survey Region.*

Year.	Population.		Percentage of Population.	
	North and East.	South and West.	North and East.	South and West.
1851 ...	821,305	617,819	57·1	42·9
1861 ...	986,706	734,076	57·4	42·6
1871 ...	1,105,550	851,993	56·5	43·5
1881 ...	1,333,383	1,049,102	55·9	44·1
1891 ...	1,526,475	1,214,946	55·7	44·3
1901 ...	1,664,792	1,393,519	54·4	45·6
1911 ...	1,777,038	1,547,119	53·5	46·5
1921 ...	1,747,107	1,588,511	52·4	47·6

TABLE IV.—Changes in Population in Employment Exchange Areas. 1901–1921.

District.	Population.			Percentage to Total Population.		
	1901.	1911.	1921.	1901.	1911.	1921.
I. Blackburn	283,894	299,416	288,305	7·7	7·4	7·0
II. Burnley	197,429	222,165	216,159	5·4	5·5	5·2
III. Bacup	72,101	71,553	67,125	2·0	1·8	1·6
Total Weaving Area	553,424	593,134	571,589	15·0	14·7	13·8
IV. Preston	224,839	241,109	254,694	6·1	6·0	6·2
V. Bolton	321,971	348,437	347,029	8·7	8·6	8·4
VI. Rochdale	276,002	278,452	274,371	7·5	6·9	6·6
VII. Oldham	247,926	269,702	268,570	6·7	6·7	6·5
VIII. Stalybridge	334,919	365,921	367,213	9·1	9·1	8·9
Total Spinning Area	1,405,657	1,503,621	1,511,877	38·1	37·3	36·6
IX. Wigan	258,440	280,106	283,263	7·0	6·9	6·8
X. St. Helens	276,464	315,391	334,629	7·5	7·8	8·1
Total Coal and Chemical Area	534,904	595,497	617,892	14·5	14·7	14·9
XI. Trafford Park	367,315	413,067	427,610	10·0	10·2	10·3
XII. Manchester	672,661	748,457	766,677	18·2	18·6	18·5
Total Engineering and Dress Area.	1,039,976	1,161,524	1,194,287	28·2	28·8	28·9
XIII. Lancaster	155,772	182,155	242,468	4·2	4·5	5·9
GRAND TOTAL	3,689,733	4,035,931	4,138,113	100	100	100

TABLE V.—*Increase or Decrease of Population, Natural Increase and Gain or Loss by Migration in Eighteen Registration Districts, 1891-1901.*

Registration District.	Increase.	Excess of Births over Deaths.	Gain (+) or Loss (-) by Migration.
Preston	8,690	11,916	- 3,226
Blackburn	18,617	21,155	- 2,538
Burnley	31,800	22,152	+ 9,648
Haslingden	5,480	9,328	- 3,848
Chorley	7,943	7,278	+ 665
Bolton	30,788	28,835	+ 1,953
Bury	3,462	9,424	- 5,962
Rochdale	7,647	6,158	+ 1,389
Oldham	13,507	15,486	- 1,979
Ashton-under-Lyne ...	11,131	13,762	- 2,631
Total for North and East	139,065	145,494	- 6,429
Wigan	24,477	31,811	- 7,334
Warrington	16,488	15,854	+ 634
Leigh	15,486	12,941	+ 2,545
Chorlton	42,778	34,037	+ 8,741
Salford	24,928	23,261	+ 1,667
Prestwich	42,906	11,599	+ 31,307
Manchester	-12,784	13,028	- 25,812
Barton-upon-Irwell ...	21,303	11,193	+ 10,110
Total for South and West	175,582	153,724	+ 21,858

TABLE VI.—*Increase or Decrease of Population, Natural Increase, and Gain or Loss by Migration in Eighteen Registration Districts, 1901-11.*

Registration District.	Increase.	Excess of Births over Deaths.	Gain (+) or Loss (-) by Migration.
Preston	9,058	13,227	- 4,169
Blackburn	12,025	18,708	- 6,683
Burnley	24,700	18,880	+ 5,820
Haslingden	1,359	7,756	- 6,397
Chorley	6,792	7,677	- 885
Bolton	18,340	27,877	- 9,537
Bury	3,785	8,746	- 4,961
Rochdale	8,665	6,392	+ 2,273
Oldham	19,957	16,991	+ 2,966
Ashton-under-Lyne ...	6,641	13,641	- 7,000
Total for North and East	111,322	139,895	- 28,573
Wigan	14,716	31,368	- 16,652
Warrington	13,999	15,390	- 1,391
Leigh	9,421	13,353	- 3,932
Chorlton	49,601	41,006	+ 8,595
Salford	11,873	27,326	- 15,453
Prestwich	44,685	19,220	+ 25,465
Manchester	- 18,551	14,550	- 33,101
Barton-upon-Irwell ...	27,856	14,403	+ 13,453
Total for South and West	153,600	176,616	- 23,016

TABLE VII.—*Increase or Decrease of Population, Natural Increase, and Gain or Loss by Migration in Thirteen Employment Exchange Areas, 1911-21.*

District.	Increase or Decrease.	Excess of Births over Deaths.	Gain (+) or Loss (-) by Migration.
I. Blackburn	-11,111	+10,083	-21,194
II. Burnley	- 6,006	+ 8,631	-14,637
III. Bacup	- 4,428	+ 1,416	- 5,844
Weaving Area	-21,545 -3·6 per cent.	+20,130 +3·4 per cent.	-41,675 -7·0 per cent.
IV. Preston	+13,585	+23,557	- 9,972
V. Bolton	- 1,408	+21,760	-23,168
VI. Rochdale	- 4,081	+ 6,016	-10,097
VII. Oldham	- 1,132	+11,526	-12,658
VIII. Stalybridge	+ 1,292	+12,533	-11,241
Spinning Area	+ 8,256 +0·5 per cent.	+75,392 +5·0 per cent.	-67,136 -4·5 per cent.
IX. Wigan	+ 3,157	+31,284	-28,127
X. St. Helens	+19,238	+37,528	-18,290
Coal and Chemical Area.	+22,395 +3·8 per cent.	+68,812 +11·6 per cent.	-46,417 -7·8 per cent.
XI. Trafford Park	+14,543	+30,362	-15,819
XII. Manchester	+18,220	+55,716	-37,496
Engineering and Dress Area.	+32,763 +2·8 per cent.	+86,078 +7·4 per cent.	-53,315 -4·6 per cent.
XIII. Lancaster	+60,313 +31·1 per cent.	+ 6,022 +3·3 per cent.	+54,291 +29·8 per cent.

TABLE VIII.—*Occupied, Retired or Unoccupied, and Total Population of Lancashire and England and Wales.*

	LANCASHIRE.			ENGLAND AND WALES.			Percentage of Lancashire to England and Wales.		
	Occupied.	Retired or Unoccupied.	Total.	Occupied.	Retired or Unoccupied.	Total.	Occupied.	Retired or Unoccupied.	Total.
1891	1,914,545	1,093,905	3,008,450	12,899,464	9,154,373	22,053,837	14·8	11·9	13·6
1901	2,089,924	1,329,043	3,418,967	14,328,727	10,995,117	25,323,844	14·6	12·1	13·5
1911	2,330,773	1,444,246	3,775,019	16,284,399	12,234,914	28,519,313	14·3	11·8	13·2
1921	2,447,960	1,422,858	3,870,818	17,178,050	12,422,863	29,600,913	14·3	11·5	13·1

The figures for 1921 relate to persons of 12 years and upwards. Those for earlier years to persons of 10 years and upwards.

TABLE IX.—*Relation of Occupied to Total Population aged 10 years and upwards—Males.*

Year.	LANCASHIRE.			ENGLAND AND WALES.		
	Occupied.	Total.	Percentage Occupied.	Occupied.	Total.	Percentage Occupied.
1891 ...	1,239,194	1,434,446	86.4	8,883,254	10,591,967	83.9
1901 ...	1,395,833	1,626,721	85.8	10,156,976	12,134,259	83.7
1911 ...	1,538,937	1,789,336	86.0	11,453,665	13,662,200	83.8
1921* ...	1,614,243	1,803,765	89.5	12,112,718	13,901,108	87.1

* For 1921 aged 12 years and upwards.

TABLE X.—*Relation of Occupied to Total Population aged 10 years and upwards—Females.*

Year.	LANCASHIRE.			ENGLAND AND WALES.		
	Occupied.	Total.	Percentage Occupied.	Occupied.	Total.	Percentage Occupied.
1891 ...	695,351	1,574,004	42.9	4,016,210	11,461,870	35.0
1901 ...	694,091	1,792,246	38.9	4,171,751	13,189,585	31.6
1911 ...	791,836	1,985,683	39.9	4,830,734	14,857,113	32.5
1921* ...	833,717	2,067,053	40.3	5,065,332	15,699,805	32.3

* For 1921 aged 12 years and upwards.

TABLE XI.

Occupied, Retired or Unoccupied, and Total Population of 10 years and upwards in Lancashire expressed as percentages of the corresponding numbers in England and Wales.

Year.	Males.			Females.		
	Occupied.	Retired or Unoccupied.	Total.	Occupied.	Retired or Unoccupied.	Total.
1891 ...	13.9	11.4	13.5	16.8	12.1	13.7
1901 ...	13.7	11.7	13.4	16.6	12.2	13.6
1911 ...	13.4	11.3	13.1	16.4	11.9	13.4
1921 ...	13.3	10.6	13.0	16.5	11.6	13.2

TABLE XII.

Numbers Occupied in the Cotton Industry.

Year.	LANCASHIRE.			ENGLAND AND WALES.			Percentage of Total in Lanca.
	Males.	Females.	Total.	Males.	Females.	Total.	
1861 ...	153,490	202,701	356,191	197,572	259,074	456,646	78.0
1871 ...	148,813	227,234	376,047	188,272	279,870	468,142	80.3
1881 ...	150,779	249,799	400,578	185,410	302,367	487,777	82.1
1891 ...	178,175	281,799	459,974	213,231	332,784	546,015	84.2
1901 ...	162,304	274,373	436,677	196,898	332,233	529,133	82.5
1911 ...	193,652	309,981	503,633	233,380	371,797	605,177	83.2

TABLE XIII.
Percentage Increase or Decrease of Cotton Operatives in each Decade.

Year.	LANCASHIRE.			ENGLAND AND WALES.		
	Males.	Females.	Total.	Males.	Females.	Total.
1861-71 ...	- 3.1	+12.1	+ 5.6	- 4.7	+ 8.0	+ 2.5
1871-81 ...	+ 1.3	+ 9.9	+ 6.5	- 1.6	+ 8.0	+ 4.2
1881-91 ...	+18.2	+12.8	+14.8	+15.0	+10.1	+11.9
1891-1901	- 8.9	- 2.6	- 5.1	- 7.7	- 0.2	- 3.1
1901-11 ...	+19.3	+13.0	+15.3	+18.5	+11.9	+14.4

TABLE XIV.
Lancashire Cotton Operatives. Numbers Occupied
at each Age Group, 1891, 1901 and 1911.

Age Group.	Numbers of Males.			Increase or Decrease per cent.	
	1891.	1901.	1911.	1891-1901.	1901-1911.
10-15	36,240	23,759	24,683	-34.4	3.9
15-20	44,153	35,766	45,666	-19.0	27.7
20-25	30,900	27,627	32,599	-10.6	18.0
25-35	44,030	45,169	48,223	2.6	6.8
35-45	28,267	32,913	39,247	16.4	19.2
45-55	17,651	19,693	26,870	11.6	36.4
55-65	8,891	9,316	12,588	4.8	35.1
65-	3,099	2,655	3,504	-14.3	32.0
	213,231	196,898	233,380	- 7.7	18.5
Numbers of Females.					
10-15	49,166	36,114	36,084	-26.5	- 0.1
15-20	92,092	91,408	94,792	- 0.7	3.7
20-25	68,118	75,400	76,661	10.7	1.7
25-35	70,383	74,277	89,617	5.5	20.7
35-45	32,895	35,130	45,530	6.8	29.6
45-55	14,688	14,490	21,344	- 1.3	47.3
55-65	4,474	4,587	6,450	2.5	40.6
65-	968	827	1,319	-14.6	59.5
	332,784	332,233	371,797	- 0.2	11.9

TABLE XV.
Numbers Occupied in the Dress Trades.

Year.	LANCASHIRE.			ENGLAND AND WALES.		
	Males.	Females.	Total.	Males.	Females.	Total.
1871 ...	42,733	49,249	91,982	426,470	579,391	1,005,861
1881 ...	42,044	67,227	109,271	404,096	644,438	1,048,534
1891 ...	44,175	83,960	128,135	445,000	736,514	1,181,514
1901 ...	47,746	95,437	143,183	447,946	777,653	1,225,599
1911 ...	50,177	105,604	155,781	461,208	835,883	1,297,091

Following the practice of the Census of 1911, wig makers and hairdressers, who are included under the Order in the earlier Censuses, have been omitted, as also have laundry-keepers. The figures include, however, drapers, linen drapers, and mercers.

TABLE XVI.
Percentage Increase or Decrease of number occupied in the Dress Trades in Lancashire.

—			Males.	Females.	Total.
1871-81 ...	...	...	- 1.6	+ 36.5	+ 18.8
1881-91 ...	...	...	+ 5.1	+ 24.9	+ 17.3
1891-1901 ...	...	...	+ 8.1	+ 13.7	+ 11.7
1901-11 ...	...	...	+ 5.1	+ 10.7	+ 8.8

TABLE XVII.
Numbers occupied in the Coal Industry.

Year.	LANCASHIRE.			ENGLAND AND WALES.		
	Males.	Females.	Total.	Males.	Females.	Total.
1861 ...	41,764	717	42,481	246,613	3,763	250,376
1871 ...	45,634	30	45,664	268,091	3,251	271,342
1881 ...	59,557	1,244	60,801	378,664	3,099	381,763
1891 ...	77,509	2,037	79,546	513,843	3,267	517,110
1901 ...	86,539	2,033	88,572	640,939	2,665	643,654
1911 ...	100,739	2,378	103,117	874,304	2,843	877,147
1921 ...	106,862	2,331	109,193	990,409	3,059	993,468

TABLE XVIII.
Percentage Increase in Males occupied in the Coal Industry.

Year.	Lancashire.	England and Wales.
1861-71 ...	9.3	8.7
1871-81 ...	30.5	41.2
1881-91 ...	30.1	35.7
1891-1901 ...	11.7	24.7
1901-11 ...	16.4	36.4
1911-21 ...	6.1	13.3

TABLE XIX.
*Numbers Occupied in the Metal, Engineering and Machine-Making Trades
 in Lancashire.*

Year.	Males.	Females.	Total.	Percentage Increase of Males.
1881	112,296	1,253	113,549	—
1891	132,431	1,995	134,426	18·0
1901	174,650	3,016	177,666	32·0
1911	205,284	6,308	211,592	17·5

TABLE XX.
*Numbers Occupied in the Paper and Printing Trades in Lancashire and
 England and Wales.*

Year.	LANCASHIRE.			ENGLAND AND WALES.		
	Males.	Females.	Total.	Males.	Females.	Total.
1861	8,313	1,668	9,981	69,762	18,184	87,946
1871	11,427	3,303	14,730	94,042	24,760	118,802
1881	15,497	5,890	21,387	116,520	41,711	158,231
1891	21,007	8,948	29,955	156,337	63,212	219,549
1901	25,725	13,051	38,776	188,057	90,900	278,957
1911	29,548	17,493	47,041	226,451	121,576	348,027

The figures include (1) Circular, Envelope-Addressers, (2) Bill-Posters, and (3) Advertising, Bill-Posting agents.

TABLE XXI.
*Numbers Occupied in the Manufacture of Chemicals, Oils, Grease, Soap, Resin, etc.
 (including the making of elastic web and celluloid) in Lancashire.*

Year.	Males.	Females.	Total.
1861	6,343	226	6,569
1871	9,395	922	10,317
1881	11,541	1,280	12,821
1891	16,668	2,638	19,306
1901	21,445	5,570	27,015
1911	28,876	8,617	37,493

APPENDIX 2.

TABLE I.

Geographical Distribution of Insured Unemployed Persons in All Industries in Survey Region—1923, 1927 and 1929.

Sub-Area.	1923.					1927.					1929.				
	Men.	Boys.	Women.	Girls.	Total.	Men.	Boys.	Women.	Girls.	Total.	Men.	Boys.	Women.	Girls.	Total.
Blackburn, etc. ...	8·0	9·1	12·2	7·8	9·5	6·4	5·9	10·6	6·5	7·6	9·1	8·5	13·9	8·9	10·7
Bacup, etc. ...	1·4	1·7	2·0	1·5	1·6	1·8	2·0	3·3	2·2	2·2	1·8	2·3	2·6	1·9	2·1
Oldham, etc. ...	13·0	19·4	15·2	17·1	14·0	12·3	10·2	13·5	10·2	12·6	8·5	7·8	9·6	7·7	8·9
Littleborough, Bury, etc.	7·6	9·0	10·1	10·5	8·6	5·8	5·4	7·1	6·9	6·2	5·4	4·2	7·0	4·4	5·9
Stalybridge, Hyde, etc.	10·4	10·9	12·8	11·5	11·3	7·5	6·6	10·7	10·4	8·4	8·5	8·3	10·7	10·5	9·2
Bolton, Leigh, etc. ...	7·4	6·4	7·2	8·4	7·3	10·8	8·0	8·1	6·5	9·9	12·3	15·6	11·8	14·9	12·2
Atherton, Wigan, etc.	2·5	2·5	6·5	11·6	4·2	9·5	14·0	7·5	11·9	9·0	10·2	11·4	6·9	12·0	9·1
St. Helens, Runcorn, etc.	6·9	3·3	1·4	2·9	4·8	8·9	11·3	2·0	7·3	7·0	7·8	9·6	2·2	8·4	6·0
Chorley, Preston ...	4·8	4·7	5·9	4·8	5·3	4·8	4·4	5·8	4·8	5·1	5·7	4·9	6·4	4·6	5·9
Trafford Park, Eccles, etc.	8·2	9·0	5·1	7·5	7·1	7·4	9·7	6·8	11·5	7·3	6·9	6·6	5·9	6·3	6·5
Lancaster, etc. ...	1·7	1·0	1·4	1·5	1·5	2·6	2·8	2·3	2·9	2·5	2·9	1·6	2·0	4·0	2·6
Burnley, Nelson, Colne.	5·4	5·4	8·3	4·9	6·4	3·4	2·9	6·2	2·8	4·2	4·1	3·0	5·9	2·8	4·7
Levenshulme, Man- chester, etc.	22·7	17·6	11·9	10·0	18·4	18·8	16·8	16·1	16·1	18·0	16·8	16·2	15·1	13·6	16·2
TOTAL ...	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

TABLE II.
*Percentage Distribution of Insured Unemployed Persons in Survey Region.
 1923 and 1929.**

Industry.	1923.			1929.		
	Males.	Females.	Total.	Males.	Females.	Total.
Cotton	24.2	79.0	45.2	17.4	65.6	34.2
Coal Mining	3.4	0.2	2.2	15.9	0.7	10.6
Glass	0.5	0.1	0.3	0.7	0.2	0.5
Chemicals	1.9	0.3	1.3	1.2	0.3	0.9
Oil, Glue, etc.	0.3	0.1	0.2	0.2	0.2	0.2
Steel Melting, etc.	1.5	—	0.9	2.2	—	1.5
Wire and Wire Netting	0.6	0.1	0.4	0.6	0.1	0.4
General Engineering	23.7	0.4	14.7	13.1	0.7	8.7
Electrical Engineering	0.7	0.1	0.5	0.8	0.3	0.6
Motor Vehicles	1.4	0.1	0.9	1.0	0.1	0.7
Railway Carriages	0.3	—	0.2	0.4	—	0.3
Electric Cables, etc.	0.4	0.2	0.3	0.4	0.3	0.4
Metals N.S.S.	0.3	0.2	0.3	0.4	0.2	0.4
Woollen and Worsted	0.3	0.6	0.4	0.3	0.8	0.5
Finishing Textile	4.3	1.9	3.4	5.6	3.3	4.8
Tailoring	0.7	2.3	1.3	0.7	2.6	1.3
Dress Making, etc.	0.1	1.5	0.6	0.1	1.1	0.4
Hats and Caps	0.7	0.8	0.7	0.4	0.9	0.5
Shirts, Underclothing	—	1.0	0.4	0.1	0.8	0.3
Boots, Shoes	0.7	0.4	0.6	0.8	1.0	0.9
Bread, Cakes	0.8	0.6	0.7	0.5	0.7	0.6
Drink	0.3	0.3	0.3	0.4	0.3	0.3
Paper and Paper Board	0.8	0.2	0.6	0.4	0.2	0.3
Printing and Publishing	0.5	0.5	0.5	0.5	0.8	0.6
Building	5.8	—	3.6	8.2	—	5.4
Rubber	1.1	1.1	1.1	0.9	1.6	1.2
Gas, Water, Electricity	1.2	—	0.8	1.2	—	0.8
Railway Service	1.0	—	0.7	0.5	—	0.3
Tram and 'Bus	0.3	—	0.2	0.5	—	0.3
Other Road Transport	2.1	—	1.3	1.8	—	1.2
Dock, Harbour, etc.	1.1	—	0.7	1.7	—	1.1
Distribution	3.9	2.7	3.5	5.9	5.1	5.6
Commerce, etc.	0.3	0.1	0.2	0.2	0.1	0.1
National Government	1.0	0.1	0.6	0.6	0.1	0.4
Local Government	0.8	—	0.5	2.1	0.1	1.4
Prof. Services	0.2	0.1	0.2	0.2	0.1	0.2
Hotel, etc.	0.5	2.0	1.1	0.7	3.1	1.5
Other Industries	12.4	2.8	8.7	11.4	8.9	10.5
Total	100	100	100	100	100	100

* The 37 industries included above are those with over 6,000 insured employed persons in 1923.

APPENDIX 3.

TABLE I.

Insured-Employed Persons at June 1929 in each of 101 Industries in the Survey Region and their Relation to Total "Insured Employed" in Great Britain and Northern Ireland.

Industry.	Insured-Employed in Survey Region.	Percentage of Insured-Employed in Great Britain and N. Ireland.
Fishing	2,574	10·1
Coal Mining	57,188	6·6
Iron Ore Mining, etc.	5	—
Lead, Tin and Copper Mining	—	—
Stone Quarrying and Mining	1,370	3·5
Slate Quarrying	276	3·0
Mining and Quarrying N.S.S.	430	2·8
Clay, Sand, Chalk, Gravel, etc.	95	0·6
Coke Ovens, etc.	315	2·9
Artificial Stone and Concrete	2,366	15·6
Cement, Lime Kilns, etc.	30	0·2
Brick, Tile, etc. Making	4,986	6·7
Pottery, Earthenware, etc.	1,323	2·1
Glass (excl. bottles, etc.)	9,319	36·9
Glass Bottles	4,080	27·7
Chemicals	17,126	17·2
Explosives	345	2·0
Paint, Varnish, etc.	1,519	8·4
Oil, Glue, Soap, etc.	7,462	10·8
Pig Iron	—	—
Steel Melting, Rolling, etc.	6,307	4·4
Brass, Copper, etc.	2,794	7·6
Tin Plates	45	0·2
Iron and Steel Tubes	225	0·8
Wire, Wire Netting, etc.	6,958	34·3
General Engineering	87,560	16·4
Electrical Engineering	18,718	23·2
Marine Engineering	515	1·0
Constructional Engineering	2,376	9·4
Motor Vehicles	12,100	5·3
Carriages, Carts, etc.	1,346	7·7
Railway Carriages, etc.	6,271	12·7
Shipbuilding and Repairing	1,095	0·7
Stove, Grate, Pipe, etc.	5,530	6·9
Electrical Wiring, etc.	1,024	6·6
Electric Cables	10,074	11·2
Hand Tools, Cutlery... ..	510	1·8
Bolts, Nuts, Screws, etc.	1,435	6·2
Brass and Allied Metals	1,009	3·9
Heating and Ventilating Apparatus	392	4·7
Watches, Clocks, etc.	731	1·9
Metal Industries N.S.S.	8,686	4·9

TABLE I—cont.

Industry.	Insured Employed in Survey Region.	Percentage of Insured Employed in Great Britain and N. Ireland.
Cotton	400,856	83·7
Woolen and Worsted	6,109	3·0
Silk and Artificial Silk	7,141	10·5
Linen	205	0·3
Jute	34	0·1
Hemp, Rope, etc.	2,289	13·6
Hosiery	2,231	2·2
Lace	144	0·9
Carpets	586	2·5
Textiles N.S.S.	7,549	18·0
Textile Bleaching, Dyeing, etc	43,158	43·0
Tanning, Currying, etc.	6,559	17·4
Leather Goods	962	4·0
Tailoring	23,753	12·5
Dress Making and Millinery	8,814	8·8
Hats and Caps	10,849	32·2
Shirts, Underclothing	16,577	21·4
Dress Industries N.S.S.	2,066	7·9
Boots, Shoes	8,442	7·2
Bread, Cakes	13,580	10·0
Grain Milling	2,069	7·5
Cocoa, Sugar Confectionery	4,149	6·3
Food Industries N.S.S.	6,228	6·1
Drink Industries	7,390	7·3
Tobacco, Cigar, etc.	1,396	3·2
Sawmilling, etc.	3,414	6·4
Wood Boxes, etc.	2,271	19·9
Furniture	7,299	6·4
Wood Working, etc.	1,644	7·8
Paper and Paper Board, etc.	8,050	15·2
Cardboard Boxes, etc.	6,078	10·9
Wallpaper Making	1,745	29·2
Stationery Requisites	281	4·7
Printing, Publishing, etc.	22,513	9·0
Building	55,940	7·4
Public Works Contracting	6,076	4·5
Rubber	14,413	23·7
Oilcloth, Linoleum	4,828	36·9
Brushes and Brooms	694	7·7
Scientific Instruments	921	3·6
Musical Instruments... ..	363	1·4
Toys, Games, etc.	450	3·8
Gas, Water and Electricity	16,771	10·9
Railway Service	10,934	8·3
Tram and 'Bus Service	18,948	12·6
Road Transport N.S.S.	11,500	7·1
Shipping Service	1,842	1·5
Dock, Harbour, etc.	6,894	5·9
Transport, etc. N.S.S.	880	5·4
Distributive Trades	134,836	8·5

TABLE I—*cont.*

Industry.	Insured Employed in Survey Region.	Percentage of Insured Employed in Great Britain and N. Ireland.
Commerce, Banking, etc.	4,864	2·2
National Government	5,081	4·6
Local Government	22,729	9·0
Professional Services	8,452	7·1
Entertainments, etc.	7,351	11·1
Hotel, Club, etc.	17,521	5·6
Laundries, Dyeing, etc.	8,431	6·5
Industries and Services, N.S.S. ...	5,019	4·9
Total	1,288,679	11·8

TABLE II.

Insured-Employed in Survey Region at June, 1929, in All Industries and in "Manufacturing, Mining and Building," and their Relation to Insured Employed in Great Britain and Northern Ireland.

	Total Insured Employed.	Insured Employed in "Manufacturing, Mining and Building."
Survey Region	1,288,679	1,004,052
Great Britain and Northern Ireland.	10,930,343	7,150,068
Percentage Survey Region to Great Britain.	11·8	14·0

TABLE III.

*Census of Production, 1924.**"Lancashire with N. Cheshire and the Glossop and New Mills Districts of Derbyshire" as Percentage of United Kingdom.*

Trade.	Persons Employed.							
	Gross Output.	Net Output.	Operative Staff.			Administrative, Clerical and Technical Staff.	Total Employed.	Horse Power of Prime Movers.
			Males.	Females.	Total.			
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Iron and Steel	14.4	15.4	15.2	10.6	14.7	15.6	14.8	11.6
Non-Ferrous Metals	13.4	7.1	6.3	3.3	5.5	5.2	5.5	8.3
Textiles	49.4	43.2	49.0	44.0	46.0	35.1	45.4	62.9
Clothing	15.2	14.4	13.4	16.1	15.3	14.0	15.2	16.1
Food, etc.	17.5	16.0	14.3	15.9	15.0	15.2	15.0	17.8
Chemicals	27.0	28.7	29.6	24.2	28.4	27.0	28.1	21.7
Paper	15.6	14.3	13.8	15.0	14.3	12.3	14.0	18.3
Timber	12.2	11.6	11.5	12.7	11.7	12.7	11.8	12.9
Leather, etc.	28.1	25.8	24.2	23.8	24.0	21.9	23.7	30.7
Building, etc.	12.8	12.7	12.1	7.1	11.7	14.1	11.9	15.6
Mines	12.4	12.4	13.0	44.5	13.2	13.5	13.2	14.3
Miscellaneous	15.7	14.0	12.9	8.7	11.4	10.9	11.3	24.2
Public Utilities	14.7	15.3	14.6	13.6	14.6	14.6	14.6	20.6
All Trades	22.8	19.0	17.4	27.2	20.0	17.2	19.7	22.9

TABLE IV.

*Index of Numbers of Insured Employed Persons in (a) Survey Region and (b) Great Britain and Northern Ireland at June 1923, 29, 30, 31 for each of the "Expanding Industries" showing more than a 10 per cent. increase in numbers of Insured Employed in Great Britain and Northern Ireland between 1923 and 1929.**
(1923 = 100).

Industry.	Great Britain and Northern Ireland.				Survey Region.			
	1923.	1929.	1930.	1931.	1923.	1929.	1930.	1931.
Silk and Artificial Silk	100	194·2	174·4	147·1	100	535·3	435·5	500·9
Electrical Wiring	100	155·4	167·4	193·2	100	202·8	210·3	206·9
Artificial Stone	100	167·6	160·5	168·2	100	532·9	523·1	451·1
Heating and Ventilating Apparatus ...	100	158·8	159·8	146·2	100	117·4	112·9	109·3
Tram and 'Bus Service... ..	100	143·7	149·9	157·9	100	266·5	270·1	284·6
Scientific Instrument	100	154·7	148·4	138·1	100	183·8	215·8	205·0
Electrical Engineering	100	141·7	146·1	139·1	100	134·4	138·4	122·1
Public Works	100	130·4	140·6	204·7	100	116·0	138·7	251·5
Electric Cables	100	137·9	145·1	143·0	100	150·6	152·2	143·4
Paint, Varnish, etc.	100	139·9	138·8	142·2	100	121·3	116·0	116·1
Distribution	100	134·4	137·4	141·7	100	125·2	125·6	129·7
Brick, Tile, etc.	100	133·2	132·5	131·2	100	138·5	129·7	140·6
Clay, Sand, etc.	100	127·3	132·6	117·2	100	123·4	102·6	80·5
Hotels, etc.	100	133·6	133·3	139·4	100	128·3	117·5	119·8
Road Transport N.S.S.	100	132·5	131·8	138·1	100	115·2	115·3	115·3
Furniture	100	129·8	128·9	125·6	100	122·9	119·0	125·4
Stationery Requisites	100	133·3	130·9	123·0	100	1,652·9	2,517·6	2,111·8

Laundries, etc.	100	128·6	130·2	133·6	100	166·7	158·2	154·5
Local Government	100	111·4	122·6	128·2	100	83·5	90·9	94·0
Wallpaper	100	134·8	128·1	126·8	100	121·1	113·3	117·2
Stone Quarrying	100	128·5	125·7	130·4	100	176·2	216·1	243·6
Entertainments, etc.	100	128·3	126·7	142·2	100	133·0	121·3	132·1
Industries and Services N.S.S.	100	128·4	125·0	122·6	100	98·0	103·3	85·6
Motor Vehicles, etc.	100	132·8	123·7	114·1	100	116·8	113·4	113·0
Shirts, Underclothing	100	125·4	123·7	125·2	100	193·7	198·8	199·8
Toys, Games, etc.	100	112·5	119·9	113·0	100	87·9	54·7	54·1
Brushes, etc.	100	113·4	119·2	110·3	100	154·9	144·0	138·2
Printing, Publishing	100	116·8	119·2	117·1	100	130·6	126·3	126·4
Musical Instruments	100	142·6	117·7	102·1	100	95·8	58·8	63·9
Building	100	120·6	115·9	112·3	100	119·8	102·6	95·9
Food Industries N.S.S.	100	119·1	117·8	116·8	100	174·5	161·1	170·6
Professional Services	100	113·5	117·1	121·1	100	116·9	117·3	124·1
Metal Industries N.S.S.	100	120·5	116·0	108·9	100	119·7	113·5	108·8
Rubber	100	119·7	115·1	106·6	100	110·2	107·9	97·6
Cement, etc.	100	123·1	113·0	97·9	100	65·2	182·6	39·1
Constructional Engineering	100	124·3	114·6	108·8	100	167·7	169·4	128·9
Iron and Steel Tubes	100	126·7	114·0	82·5	100	128·6	22·3	26·9
Fishing	100	113·6	112·5	116·9	100	100·5	119·3	108·7
Glass Bottles	100	118·4	111·3	113·5	100	186·3	134·1	178·2
Stove, Grate, etc.	100	114·6	109·0	99·1	100	108·8	97·2	83·5
Oilcloth, etc.	100	114·6	107·8	96·0	100	109·0	103·2	99·9
Hosiery	100	119·1	108·7	107·2	100	138·2	159·4	160·5
Total	100	128·2	128·2	129·9	100	128·7	125·7	127·4

* No allowance for exclusion of those over 65 years of age after January, 1928.

APPENDIX 4.

TABLE I.

*Census of Population, 1921.**England and Wales.**Percentage of Females to Males by Age-Group of Occupied Persons in (a) Cotton Carding, Spinning, Doubling; (b) Cotton Weaving; (c) All Industries.*

Age last Birthday. Years.	Percentage Females to Males.		
	Cotton Carding, Spinning, Doubling and Thread Mills.	Cotton Weaving.	All Industries.
14-15	144	210	68
16-17	177	261	79
18-19	206	306	83
20-24	237	312	76
25-34	151	240	41
35-44	83	165	27
45-54	52	94	23
55-59	40	66	23
60-64	35	57	23
65-69	29	42	24
Total (All occupied aged 14 years and over).	127	184	42

TABLE II.

Percentage Sex Distribution in Great Britain and Northern Ireland of the Insured Population in (a) Cotton and (b) All Industries, 1923-1930.

Year.	Cotton.	All Industries.
	Females as Percentage of Males.	Females as Percentage of Males.
1923	173·1	34·9
1924	179·1	35·8
1925	176·2	36·4
1926	174·9	36·2
1927	174·6	36·3
1928	179·8	37·8
1929	176·4	38·1
1930	186·8	38·9

From 1928 onwards persons over 65 were excluded from the insured population, but this change is not likely to invalidate the comparison seriously.

TABLE III.

*Census of Population, 1921.**Percentage Marital Distribution among (a) Female Textile Workers in "Lancashire and parts of Cheshire and Derbyshire" and (b) Total Occupied Females in England and Wales.*

	Single.	Married.	Widowed or Divorced.	Total
Lancashire Textile Workers.	67.0	28.1	4.9	100.0
All Occupations—England and Wales.	77.9	13.7	8.4	100.0

TABLE IV.

*Census of Population, 1921.**Percentage Distribution of Textile Workers (between different occupations) in Lancashire.*

	Males.	Females.
Employers and Managers	3.1	—*
Foremen and Overlookers	8.7	—
Spinners and Piecers (Mule, Ring, Cap, Flyer)	21.6	7.6
Breakers, Rag Grinders, Hecklers and Willowers	1.3	—
Card, Comb, and Frame Tenters (not ring, cap, or flyer frame). Box minders.	1.3	12.1
Strippers and Grinders; Card Grinders. Card Room Jobbers.	2.7	—
Doublers and Doubling Frame Tenters (not silk)	1.1	1.1
Weavers	23.0	48.9
Winders (not silk), Reelers, Warpings (not lace), Beamers	1.5	17.3
Drawers-in and Twisters-in... ..	2.1	—
Sizers, Slashers, Tapers	2.4	—
Lookers and Examiners; Burlers and Menders	1.7	—
Total	100.0	100.0

* Occupations with less than 1 per cent. of total are marked —.

TABLE V.

*Census of Population, 1921.**"Lancashire and parts of Cheshire and Derbyshire."**Numbers in "Weaving Occupations" shown under "Spinning" Industrial Group and numbers in "Spinning Occupations" shown under "Weaving" Industrial Group.*

Occupations.	In Spinning Industrial Group.		In Weaving Industrial Group.	
	Males.	Females.	Males.	Females.
<i>Weaving.</i>				
Weavers	87	745	41,096	155,774
Winders, Reelers, Beamers, Warpers.	1,026	26,887	1,628	31,036
<i>Spinning.</i>				
Spinners and Piecers	33,866	16,288	8,008	10,190
Breakers, Hecklers and Wil- lowers.	1,511	594	823	238
Card, Comb, and Frame Tenters	1,115	30,871	1,092	10,409
Strippers and Grinders. Card Room Jobbers.	3,503	449	1,551	317
Doublers	1,508	2,376	1,268	910

TABLE VI.

*Percentage Occupational Distribution of Unemployed Males in the Lancashire Cotton Industry.**

Date.	Card and Blowing Room.	Spinning.	Beaming, Warping, Winding.	Weaving.	Total.
1929—					
September 16th ...	9.4	49.0	12.3	29.3	100
December 16th ...	8.8	55.0	11.6	24.6	100
1930—					
January 20th ...	9.1	54.7	11.2	25.0	100
March 17th ...	8.8	53.3	9.7	28.2	100
June 23rd ...	9.8	49.4	10.1	30.8	100
September 15th ...	9.8	44.3	10.2	35.7	100
November 10th ...	8.2	46.9	10.0	34.9	100
1931—					
January 19th ...	8.8	50.6	9.8	30.7	100
March 16th ...	8.1	47.3	9.1	35.6	100
June 22nd ...	8.7	48.5	10.2	32.5	100
July 20th ...	8.7	48.3	9.9	33.1	100

* The figures up to November 10th, 1930, are not comparable with those for the later dates. The earlier group is based on information from 35 Employment Exchanges and excludes juveniles 16-18 years. The later group covers 66 Employment Exchanges and Branch Offices, and includes Juveniles.

TABLE VII.
*Percentage Occupational Distribution of Unemployed Females in the
 Lancashire Cotton Industry.**

Date.	Card and Blowing Room.	Spinning.	Beaming, Warping, Winding.	Weaving.	Total.
1929—					
September 16th ...	18.0	17.4	27.0	37.5	100
December 16th ...	22.0	18.8	28.1	31.1	100
1930—					
January 20th ...	21.6	18.6	28.2	31.7	100
March 17th ...	20.6	17.1	25.1	37.2	100
June 23rd ...	19.5	18.7	23.3	38.4	100
September 15th ...	17.8	14.9	19.0	48.3	100
November 10th ...	17.2	14.8	19.3	48.6	100
1931—					
January 19th ...	20.6	16.5	20.6	42.3	100
March 16th ...	19.5	15.7	20.7	44.1	100
June 22nd ...	18.9	15.9	21.5	43.7	100
July 20th ...	19.0	15.9	20.6	44.5	100

* See note to Table VI.

TABLE VIII.

*Percentage Sex Distribution of Persons Unemployed in Occupational Groups in the Lancashire Cotton Industry.**

Date:	Card and Blowing Room.			Spinning.			Beaming, Warping, Winding.			Weaving.			Total.		
	Men.	Women.	Total.	Men.	Women.	Total.	Men.	Women.	Total.	Men.	Women.	Total.	Men.	Women.	Total.
1929—															
September 16th	15·8	84·2	100	50·3	49·7	100	14·1	85·9	100	22·0	78·0	100	26·5	73·5	100
December 16th	13·2	86·8	100	52·5	47·5	100	13·4	86·6	100	23·0	77·0	100	27·4	72·6	100
1930—															
January 20th ...	13·9	86·1	100	52·9	47·1	100	13·2	86·8	100	23·2	76·8	100	27·7	72·3	100
March 17th ...	14·8	85·2	100	55·8	44·2	100	13·6	86·4	100	23·6	76·4	100	28·9	71·1	100
June 23rd ...	18·1	81·9	100	53·9	46·1	100	16·1	83·9	100	26·2	73·8	100	30·7	69·3	100
September 15th	18·8	81·2	100	55·5	44·5	100	18·4	81·6	100	23·7	76·3	100	29·6	70·4	100
November 10th	15·9	84·1	100	55·8	44·2	100	17·1	82·9	100	22·2	77·8	100	28·5	71·5	100
1931—															
January 19th ...	15·5	84·5	100	57·0	43·0	100	17·0	83·0	100	23·8	76·2	100	30·1	69·9	100
March 16th ...	16·1	83·9	100	53·2	41·8	100	16·9	83·1	100	27·1	72·9	100	31·6	68·4	100
June 22nd ...	16·5	83·5	100	56·7	43·3	100	16·9	83·1	100	24·2	75·8	100	30·0	70·0	100
July 20th ...	15·9	84·1	100	55·7	44·3	100	16·6	83·4	100	23·6	76·4	100	29·3	70·7	100

* See note to Table VI.

TABLE IX.

Percentage Distribution between "Ordinary" and "Labouring" Occupations of Total Persons Unemployed in Cotton at 65 Employment Exchanges in the Cotton Areas.

1931.			Skilled.	Unskilled.	Total.
			Per cent.	Per cent.	Per cent.
27th July	...	...	94.0	6.0	100
24th August	...	...	94.0	6.0	100
21st September	...	...	93.8	6.2	100

TABLE X.

Percentage Distribution between "Ordinary" and "Labouring" Occupations of Persons Unemployed in various Cotton Occupations at 65 Employment Exchanges in the Cotton Areas.

MEN.

Date.	Card and Blowing Room.			Spinning, etc.			Beaming, Warping, Winding.			Weaving.		
	Skilled.	Unskilled.	Total.	Skilled.	Unskilled.	Total.	Skilled.	Unskilled.	Total.	Skilled.	Unskilled.	Total.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
1931—												
July 27th	66.0	34.0	100	86.7	13.3	100	80.8	19.2	100	93.8	6.2	100
August 24th	67.3	32.7	100	86.8	13.2	100	79.7	20.3	100	94.3	5.7	100
September 21st	65.9	34.1	100	84.8	15.2	100	79.3	20.7	100	93.9	6.1	100

TABLE XI.
Percentage Distribution between " Ordinary " and " Labouring " Occupations of Persons Unemployed in various Cotton Occupations at 65 Employment Exchanges in the Cotton Areas.

WOMEN.

Date.	Card and Blowing Room.			Spinning, etc.			Beaming, Warping, Winding.			Weaving.		
	Skilled.	Unskilled.	Total.	Skilled.	Unskilled.	Total.	Skilled.	Unskilled.	Total.	Skilled.	Unskilled.	Total.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
1931—												
July 27th ...	95.3	4.7	100	90.9	9.1	100	98.0	2.0	100	99.7	0.3	100
August 24th ...	94.8	5.2	100	89.9	10.1	100	98.0	2.0	100	99.7	0.3	100
September 21st ...	95.3	4.7	100	90.9	9.1	100	98.5	1.5	100	99.7	0.3	100

TABLE XII.
Percentage Distribution between " Ordinary " and " Labouring " Occupations of Persons Unemployed in various Cotton Occupations at 65 Employment Exchanges in the Cotton Areas.

MEN AND WOMEN.

Date.	Card and Blowing Room.			Spinning, etc.			Beaming, Warping, Winding.			Weaving.		
	Skilled.	Unskilled.	Total.	Skilled.	Unskilled.	Total.	Skilled.	Unskilled.	Total.	Skilled.	Unskilled.	Total.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
1931—												
July 27th... ..	90.5	9.5	100	88.5	11.5	100	95.1	4.9	100	98.3	1.7	100
August 24th ...	90.4	9.6	100	88.1	11.9	100	94.9	5.1	100	98.5	1.5	100
September 21st ...	90.4	9.6	100	87.4	12.6	100	95.2	4.8	100	98.3	1.7	100

TABLE XIII.

Percentage Geographical Distribution of Insured Employed Persons in the Cotton Industry of the Survey Region. 1923, 1927, 1930.

<i>Groups of Employment Exchange Areas.*</i>	<i>1923.</i>	<i>1927.</i>	<i>1930.</i>
Blackburn, etc.	16.7	16.4	16.7
Burnley, etc... ..	13.4	13.2	13.2
Bury, etc.	10.4	10.4	9.8
Bacup, etc.	3.2	3.1	3.0
Preston, Chorley	8.2	8.0	7.6
Oldham, etc.	15.4	15.5	15.7
Bolton, etc.	11.7	12.4	13.1
Stalybridge, Hyde, etc.	10.7	10.4	9.4
Wigan, Atherton, etc.	3.5	3.6	3.8
Trafford Park, etc.	1.9	1.9	1.9
Manchester, etc.	4.4	4.7	5.3
Lancaster, Blackpool, etc....	0.4	0.3	0.4
Survey Region	100	100	100

* For the exact content of each group in terms of Employment Exchange Areas see map facing p. iv.

TABLE XIV.

Percentage Geographical Distribution of Insured Unemployed Persons in the Cotton Industry of the Survey Region. 1923, 1927, 1930.

<i>Groups of Employment Exchange Areas.*</i>	<i>1923.</i>	<i>1927.</i>	<i>1930.</i>
Blackburn, etc.	15.2	13.8	21.4
Burnley, etc.	11.5	9.2	12.1
Bury, etc.	12.0	9.6	8.8
Bacup, etc.	2.2	3.8	2.5
Preston, Chorley	6.2	6.6	7.2
Oldham, etc.	20.6	21.9	15.4
Bolton, etc.	6.7	7.3	10.7
Stalybridge, Hyde, etc.	13.5	13.7	11.8
Wigan, Atherton, etc.	5.3	6.0	4.3
Trafford Park, etc.	2.4	2.6	1.3
Manchester, etc.	4.2	5.3	4.3
Lancaster, Blackpool, etc....	0.2	0.3	0.2
Survey Region	100	100	100

* See note to Table XIII.

APPENDIX 5.

TABLE I.

Estimated Numbers of Cotton Spinning Spindles (000's omitted) at 31st January, 1931, on the basis of the returns made to the International Master Cotton Spinners' Federation.

Country.	Total Spinning Spindles.	Mule.	Ring.	(3) as a percentage of (1).	Percentages of spindles operating on high draft.
	(1).	(2).	(3).	(4).	(5).
Great Britain ...	54,933	41,693	13,240	24.0	Per cent. *
Germany ...	10,838	4,460	6,378	59.0	8.0
France ...	10,254	3,545	6,709	65.4	*
Italy ...	5,346	595	4,751	89.0	35.0
Belgium ...	2,154	430	1,724	80.0	4.0
Spain ...	2,070	431	1,639	79.0	29.0
Switzerland ...	1,387	576	811	58.5	*

The returns did not cover Japan and U.S.A., but the distribution of spindles in those countries has been estimated as follows:—

Japan ...	7,191	42	7,149	99.5	*
U.S.A. ...	33,345	1,094	32,251	96.7	*

* We have been unable to obtain complete statistics of high draft spindles for these countries. The percentage in Great Britain appears to be negligible.

TABLE II.

MILL A.

Comparative Particulars of a Mill formerly engaged on the production of 14's/16's twist and weft from Mules and now spinning the same quantity of 14's/16's twist on High Draft Rings.

Machines.	Old System : 122,928 mule spindles producing 180,000 lbs. of 14's/16's yarn per week on the Standard System.		New System : 64,400 high draft ring twist spindles producing 180,000 lbs. of yarn per week. High draft from Intermediate Bobbin.			
Cards ...	301	Draft. —	Hank. —	301	Draft. —	Hank. —
Draw Frames	15-2 heads of 8 dcls.	6	0.097	21-3 heads of 8 dcls.	6	0.12
Slubbers ...	15 × 96 spls.	4.4	0.43	21 × 96 spls.	4.25	0.51
Inters. ...	30 × 140 spls.	4.7	1.01	42 × 140 spls.	4.8	1.22
Rovers ...	60 × 180 spls.	4.5	2.25			
Mules ...	100	app. 7.0	14's/16's			
Rings ...				140 × 460 spls.	app. 12.5	14's/16's

LABOUR PARTICULARS.

Card Room—
20 Males. 115 Females.
Spinning Room—
150 Males.
Subsidiary—
10 Males. 5 Females.

Card Room—
20 Males. 83 Females.
Spinning Room—
4 Males. 122 Females.
Subsidiary—
10 Males. 1 Female.

SUMMARY OF LABOUR REQUIREMENTS.

<i>Old System.</i>					<i>New System.</i>				
Card Room and Spinning Room.					Card Room and Spinning Room.				
Men.	Women.	Youths.	Boys.	Girls.	Men.	Women.	Youths.	Boys.	Girls.
76	90	50	54	30	34	169	—	—	37
Total		300.			Total		240.		

It will be observed that the roving stage was cut out and the machines comprising the remaining stages (draw-frames, slubbers and intermediates) were slightly augmented in order to produce the same weight on a slightly finer hank. This meant that whereas 30 women and 25 girls were taken from the rovers, 6 women were appointed to the new draw-frames, 6 women to the new slubbers, and 6 women and 6 girls to the new intermediates, leaving a balance of 12 women and 19 girls to be absorbed in ring spinning. Of the males employed on mules before conversion, only 12 were taken into the ring room as ticketers, oilers and banders, etc.; 138 were permanently discharged; of these, 46 were men, and 92 youths and boys.

Taking the mill as a whole there was a reduction in the total volume of employed labour of 20 per cent., but whereas the demand for male labour was decreased by 81 per cent., the re-directed demand produced an increase of 71.5 per cent. of female labour.

TABLE III.

Comparative List of Machines, Labour, Power and Space Requirements, in a Medium Counts Mill spinning with Low Draft and with High Draft, with Single Roving and with Double Roving. The Mill contains 73,920 Ring Spindles and Preparation for a production of 73,920 lbs. of 36's per week of 48 Hours.

Machines.	No. 1. Ordinary Draft from 5 Hank Single Roving.			No. 2. Long Draft from 1·8 Hank Single Roving.			No. 3. Long Draft from 3·6 Hank Double Roving.			No. 4. Ordinary Draft from 7 Hank Double Roving.		
	No. of Machs.	Draft.	Hanks.	No. of Machs.	Draft.	Hanks.	No. of Machs.	Draft.	Hanks.	No. of Machs.	Draft.	Hanks.
Hopper Bale Breakers	3			3			3			3		
Hopper Openers	3			3			3			3		
Hopper Feeders	3			3			3			3		
Exhaust and Crighton Opener Com- binations	3			3			3			3		
Single Finisher Scutchers	8			8			8			8		
Roving Waste Openers	1			1			1			1		
Single Carding Engines 45 ins. X 50 ins.	144		0·14	144		0·14	144		0·12	144		0·1
Draw Frames 3 heads of 8 dcls. ...	12	6·0	0·144	12	6·0	0·144	9	6·0	0·12	14	6·0	0·1
Slubbing Frames each 100 spindles ...	12	5·0	0·72	12	5·0	0·72	9	4·5	0·54	14	5·0	0·8
Intermediate Frames each 144 spindles	24	5·0	1·8	24	5·0	1·8	16	5·0	1·35	28	5·5	2·3
Roving Frames each 184 spindles 8 in. lift, or	56	5·5	5·0	Roving	Stage	out out.	32	5·4	3·6			
Roving Frames each 200 spindles 7 in. lift.										84	6·0	7·0
Ring Spinning Frames each 480 spindles	154	7·1	36·0s	154	20·0	36·0s	154	20·0	36·0s	154	10·0	36·0
Total Number of Frames in Card room	104			48			66			140		

Approximate reduction in Frames in Card room	... ..	... ..	... ..	... ..	... ..	... ..	... ..	No. 2 over No. 1.	No. 3 over No. 4.
Approximate saving in Floor Space	... ..	... ..	... ..	... ..	... ..	... ..	... ..	53 per cent.	53 per cent.
	... ..	... ..	... ..	... ..	... ..	... ..	... ..	28 "	35 "

TABLE IV.

A comparative List of Machines in a Fine Spinning Mill with Ordinary Draft and after conversion to High Draft. The mill has 100,000 Ring Spindles and Preparation for a production of about 30,000 lbs. of average 80's carded and combed Yarns per week of 48 hours.

Machines.	Ordinary Draft from 13 hank Double Roving.			High Draft from 6 hank Double Roving.		
	No. of Machs.	Draft.	Hanks.	No. of Machs.	Draft.	Hanks.
Hopper Bale Breakers ...	1			1		
Hopper Openers ...	2			2		
Hopper Feeders ...	2			2		
Exhaust and Crighton Combinations.	2			2		
Single Finisher Scutchers	4			4		
Roving Waste Openers	1			1		
Single Carding Engines...	120		0·22	120		0·22
Sliver Lap Machines (20 cans).	10	2·5	0·025	10	2·5	0·025
Ribbon Lap Machines ...	10	6·0	0·025	10	6·0	0·025
Combers	56	45·0	0·17	56	45·0	0·17
Draw Frames 3 by 8 delts.	8	6·0	0·22	5	5·0	0·15
Slubbing Frames each 100 spls.	8	5·75	1·26	5	5·0	0·75
Intermediate Frames each 144 spls.	24	6·0	3·78	10	5·3	2·0
Roving Frames each 216 spls. 8 ins. lift or	68	7·0	13·0			
Roving Frames each 200 spls. 8 ins. lift.				28	6·0	6·0
Ring Spinning Frames each 500 spls.	200	12·3	80·0s	200	26·6	80·0s
Total No. of Frames in Card room	108			48		

Approximate reduction in Frames in Card room	55 per cent.
Approximate saving in Floor Space	34 "
Approximate saving in Workpeople (female) ...	56 "
Approximate saving in Power	62 "

TABLE V.

The following are estimates of the cost of winding and warping in a mill preparing 24,760 lbs. of 36's twist per week of 48 hours under five alternative systems. The estimates are framed to bring out the reactions of the different technical systems upon—

- (a) The capital costs of conversion.
- (b) Capital and labour charges per lb. of yarn.
- (c) The volume of labour required for the given output.

No. 1 System,

Lancashire Slow Speed System (as in common use), Winders averaging 40 spindles each. Beamers doing own creeling.

Machinery and Labour.	Weekly Cost.	Total per Week.	Total Preparation Costs per lb. of yarn.
5 Winding Frames each } 360 Spindles. 11 Beaming Frames }	Depreciation, interest and upkeep at 9 per cent. per annum. £ s. d. 2 10 0		
<i>Labour.</i> av. 45 Winders at 33s. per week 11 Beamers at 35s. „	75 0 0 19 0 0		
		£96 10 0	d. 0.935

Labour Required: 45 Winders (women and girls).
11 Beamers („ „).

Output per Head: *Winding* 605 lbs. per week.
Beaming 2,251 lbs. „

No. 2 System.

Machines as No. 1 System. Winders averaging 40 spindles per Winder, but Beamers each attending more than one frame, and receiving help for creeling.

Machinery and Labour.	Weekly Cost.	Total per Week.	Total Preparation Costs per lb. of yarn.
5 Winding Frames, each } 360 Spindles 14 Beaming Frames* }	Depreciation, interest and upkeep at 9 per cent. per annum. £ s. d. 2 15 0		
<i>Labour.</i> av. 45 Winders at 33s. per week 2 Beamers with 4 machines } 2 „ „ 3 „ } av. 40s. per week. } 3 Creelers at 20s. per week	75 0 0 8 0 0 3 0 0		
		£88 15 0	d. 0.86

Labour Required: 45 Winders (women and girls).
4 Beamers („ „).
3 Creelers (girls).

Output per Head: *Winding* 605 lbs. per week.
Beaming 3,537 lbs. „

* Reduced labour, also speed of frames reduced from 80 to 60 yds./min. More frames to maintain output.

No. 3 System.

High Speed System. High speed warping from bottle bobbins at 200-300 yards per minute. Winders, averaging 50 spindles per winder. Beamers, one operative per frame with help for creeling.

Machinery and Labour.	Weekly Cost.	Total per Week.	Total Preparation Costs per lb. of yarn.
6 Winding Frames, each 300 Spindles. Barber Knotters. 4 Beaming Frames, Magazine Creels.	Interest, depreciation and upkeep at 12 per cent. per annum*. £ s. d. 7 0 0		
<i>Labour.</i> av. 36 Winders at 35s. per week 4 Beamers at 40s. " 1 Creeler at 20s. "	63 0 0 8 0 0 1 0 0		
		£79 0 0	d. 0.77

Labour Required: 36 Winders (women and girls).
4 Beamers (" ").
1 Creeler (girl).

Output per Head: *Winding* 688 lbs. per week.
Beaming 4,952 lbs. " " "

* Increased allowance for interest, depreciation and upkeep over that allowed for Lancashire slow speed system because of shorter life, and more expensive upkeep of high speed beamers, and inclusion of Barber Knotters.

No. 4 System.

High Speed System. High speed warping from cones at 200-300 yds./min. Winders averaging 25 heads. Beamers, 2 frames per operative with help for creeling.

Machinery and Labour.	Weekly Cost.	Total per Week.	Total Preparation Costs per lb. of yarn.
7 Winding Frames, each 100 Spindles. Barber Knotters. 4 Beaming Frames, Magazine Creels.	Interest, depreciation and upkeep at 12 per cent. per annum. £ s. d. 12 14 0		
<i>Labour.</i> av. 28 Winders at 35s. per week 2 Beamers at 40s. " 2 Creelers at 20s. "	49 0 0 4 0 0 2 0 0		
		£67 14 0	d. 0.66

Labour Required: 28 Winders (women and girls).
2 Beamers (" ").
2 Creelers (girls).

Output per Head: *Winding* 884 lbs. per week.
Beaming 6,190 lbs. " "

No. 5 System.

The Barber and Colman System. Winding from roving built ring bobbins at up to 1,200 yds./min. High speed beaming from winders' cheeses at 200-300 yds./min.

Machinery and Labour.	Weekly Cost.	Total per Week.	Total Preparation Costs per lb. of yarn.
4 Winding Machines, each 100 Spindles. 3 Beaming Frames.	Depreciation, interest and upkeep at 12 per cent. per annum. £ s. d. 24 0 0		
<i>Labour.</i>			
8 Winders at 25s. per week.	10 0 0		
3 Beamers at 40s. "	6 0 0		
2 Creelers (male) at 50s. per week.	5 0 0		
1 Mechanic (male) at 80s. per week.	4 0 0		
		£49 0 0	d. 0.48

Labour Required: 8 Winders (girls).
1 Mechanic (man).
3 Beamers (women and girls).
2 Creelers (youths).

Output per Head: Winding 2,751 lbs. per week.
Beaming 4,952 " "

TABLE VI.

Mill A.—Four Looms System.

Data.—The mill contains 500 ordinary Lancashire looms, 40 ins. wide, and is run on the "room and power" system to produce a printing cloth (plain cloth) of the following particulars:—

36 ins. wide × 91.25 yds. 72/76 38's/38's.
5 per cent. contraction, warp and weft.

Loom Particulars.—Reed width, 37.75 ins.

38's ring yarn on loom beam.

38's mule weft in cop form (not rewound).

Wt. of twist yarn per cut. 7.67 lbs.

Wt. of selvedge yarn per cut. 0.164 lbs. (18 ends 2/50's Egyptian each side).

Wt. of weft yarn per cut. 8.64 lbs. (Weft waste 5 per cent.).

Weaving price from Uniform List. 68's reed. 40 ins. loom—4s. 11½d. per piece.

Analysis of Production and Expenses.

Production per loom. (40 ins. loom, 210 picks/min. 80 per cent. efficiency).

$$\frac{210 \times 60 \times 48 \times 80}{74 \times 36 \times 100} = 182 \text{ yds. per loom per week.}^*$$

$$= 2 \text{ pieces per loom per week.}$$

Production of mill = 2 × 500 = 1,000 pieces per week.

* In order to bring the production per loom per week to round figures, the picks per inch have been changed from 76 to 74. As the same method is followed on the calculation on 8 looms, the comparison is not affected.

		£	
<i>Capital Cost.</i> —500 looms at £14 per loom =		7,000	
Stores and accessories at			
£2 10s. per loom =		1,250	
Total ...		£8,250	
<i>Capital Charges.</i>			<i>Pence per cut.</i>
Interest, 5 per cent. per annum	}	10 per cent. on £8,250 ...	3·81
Deprecn. 3 " " "			
Repairs 2 " " "			
<i>Raw Material Cost.</i>			
38's ring beam at 11·25d./lb. + 0·75d./lb. for			
sizing 7·67 lbs. at 12·0d.		92·04	
38's weft (mule cop) 8·64 lbs. at 9·0d.		77·76	
2/50's Egyptian selvedge 0·164 lbs. at 15·0d.		2·46	
		<hr/> 172·26	
<i>Gain from sale of waste.</i>			
5 per cent. of 8·64 lbs. of weft 0·43 lbs. at 3·6d.		1·55	
		<hr/> 170·71	170·71
<i>Nett cost: Raw material</i>			
<i>Weaving Labour Cost.</i>			
Weaver's Wage (4s. 11½d. per piece)		59·50	59·50
			<i>Pence per cut.</i>
<i>Overhead Charges—Wages and Expenses.</i>			
Drawing and twisting (hand)		1·51	
Overlooking at 1s. 4d. per £1 of weavers' wages...		4·00	
Cloth looker, Warehousemen (1 Looker, 1 Bundler, 1 Labourer, 2 Boys).		1·90	
Office Staff (Manager, Salesman, Cashier, Boy) ...		3·78	
Room and Power		7·80	
		<hr/> 18·99	18·99
<i>Sundries.</i>			
<i>Healds and Reeds:—</i>			
Life of healds: 5 warps (75 pieces)		1·04	
Life of reeds: 2 years (200 pieces)		0·34	
Leather; pickers; shuttles		2·00	
Health and unemployment insurance		2·50	
Other insurance		0·50	
Bank interest on £5/loom at 5½ per cent. per annum		0·66	
Bad debts and allowances (estimated)		1·00	
Carriage; warp, weft and cloth (in and out) ...		2·06	
		<hr/> 10·10	10·10
			<hr/> 263·11
<i>Cost Summary.</i>			
		<i>Pence per cut.</i>	<i>Per cent. of total cost.</i>
Capital charges		3·81	1·4
Raw material cost		170·71	64·9
Weaving labour cost		59·50	22·6
Overhead charges		29·09	11·1
		<hr/> 263·11	<hr/> 100·0

Mill A.—Eight Looms System.

The number of looms in the mill was increased from 500 to 537 on account of the lower loom speed on the new system, thereby obtaining the same production as before. The reduced speed of the looms was designed to facilitate the work of the weaver, and she was further assisted by the provision of larger "cops" and of subsidiary labour for sweeping, oiling, weft and cut-carrying and taking off pieces. The weaver's wage was based on the price list circulated by the Cotton Spinners and Manufacturers' Association, October 14th, 1930, which provides for payment on a "pick" basis. The rate for this cloth (76 ends per inch, 36 ins. wide) was 16·0d. per 100,000 picks plus a 10 per cent. addition for the width of the cloth, making 17·6d. per 100,000 picks.

The working particulars are as follows:—

- Loom speed, 185 picks/minute (11·9 per cent. reduction on 4 loom speed).
- Large Cops, lasting 8–10 minutes.
- Weft waste, 3 per cent.
- Wt. of twist yarn per cut, 7·67 lbs. (as before).
- Wt. of weft yarn per cut, 8·40 lbs.
- Wt. of selvedge yarn per cut, 0·164 lbs. (as before).

Analysis of Production and Expenses.

Production per loom. (40 ins. loom, 185 picks/min., 85 per cent. efficiency).

$$= \frac{185 \times 60 \times 48 \times 85}{74 \times 36 \times 100} = 170 \text{ yards/loom/week.}$$

Number of looms to give same production as before.

$$= \frac{91 \cdot 25 \times 1,000}{170} = 537 \text{ looms.}$$

	£	s.	d.
<i>Capital Cost.</i> 537 looms at £14 per loom	7,518	0	0
Stores and Accessories at £2 10s. 0d.			
per loom ... ..	...	...	...
		1,342	10 0
Total	8,860	10	0

Capital Charges.

	<i>Pence per cut.</i>			
Interest 5 per cent. per annum	}	10 per cent.	4·1	
Depreciation 3 " "				on £8,860·5
Repairs 2 " "				
			4·1	

Raw Material Cost.

38's ring beam at 11·25d./lb. + 0·75d./lb. for sizing	
7·67 lbs. at 12·0d.	92·04
38's weft (mule cop) 8·4 lbs. at 9·0d.	75·60
2/50's Egyptian selvedge 0·164 lbs. at 15·0d.	2·46
	170·10

Gain from sale of waste.

3 per cent. of 8·4 lbs. of weft : 0·25 lbs. at 3·6d. 0·90

Nett cost: Raw material 169·20 169·20

Weaving Labour Cost.

Weaver's Wage (3/8·35 per piece) 44·35 44·35

Overhead Charges—Wages and Expenses.

Drawing and twisting (hand)	1.51	
Overlooking (£4/120 looms)	4.30	
Cloth looker, warehouseman (as before) (1 Looker, 1 Bundler, 1 Labourer, 2 Boys).	1.90	
Office Staff (as before) (Manager, Salesman, Cashier, Boy).	3.78	
Subsidiary labour at looms. (newly introduced)—		
2 weft carriers at 30s. per week		
4 sweepers at 30s. „		
1 piece carrier at 40s. „		
<hr/>		
Total £11 0s. 0d. per week.	2.63	
Room and power	8.35	
	<hr/>	
	22.47	22.47
 <i>Sundries.</i>		
Healds and reeds	1.38	
Leather, pickers, shuttles	2.00	
Health and unemployment insurance (from 2.5 to 1.34).	1.34	
Other insurance (as before)	0.50	
Bank interest (as before)	0.66	
Bad debts and allowances (as before)	1.00	
Carriage; warp, weft and cloth (as before)	2.06	
	<hr/>	
	8.94	8.94
Total		<hr/> 249.06

Cost Summary: Eight looms system.

	<i>Pence per cut.</i>	<i>Percentage of total cost.</i>
Capital Charges	4.10	1.6
Raw material cost	169.20	67.9
Weaving labour cost	44.35	17.9
Overhead charges	31.41	12.6
	<hr/>	<hr/>
Total	249.06	100.0

TABLE VII.

*Mill B.**Cloth: Burnley Printer.**Particulars: Standard Printer.**Comparative Costs of Production. Four and Eight Looms Systems.*

<i>Loom Particulars.</i>	<i>Four Looms per Weaver.</i>	<i>Eight Looms per Weaver.</i>
Speed	216	194
Efficiency (average)	85.3 per cent.	90.75 per cent.
Production per week per loom	167.5 yds.	160.5 yds.

Cost of Week's production.

<i>Raw material cost.</i>	<i>Pence.</i>	<i>Pence.</i>	<i>Pence.</i>	<i>Pence.</i>
Twist at 10d. lb.	167·5		160	
Weft at 10d. lb.(including waste) ...	175·87		166·4	
Regain from sale of waste at 5d. lb. (4 looms 5 per cent. ; 8 looms 4 per cent.).	4·18		3·2	
Nett cost : raw material ...		339·19		323·20
Weaving labour cost*		124·00		86·50
Overlooking (£4 10s. 0d. per 120 looms)		9·00		9·00
Carrying, sweeping, etc.		—		8·00
Health and unemployment insurance...		4·25		2·12
Expenses		49·85		49·85
Total cost of week's production. For 167·5 yds.		526·29d.	For 160·5 yds.	478·67d.
Cost per piece of 160·5 yds.		504·30d.		478·67d.

* Weaving cost : 4 looms system calculated on Uniform List ; 8 looms system calculated on New List.

TABLE VIII.

*Mill C.**Comparative Labour Costs of Production. Four and Eight Looms Systems.*

Cloth particulars: 35½ ins. 156 yards. 76/80. 34/40. 20% size. (plain weave).

Particulars for 9 weeks.

EIGHT LOOMS SYSTEM.

Speed.	Hours.	Yards woven.	Yards per loom.	Total picks.	Price per 100,000 picks.	Efficiency.	Wages.	Week ending.
180	48	1,290·91	161·36	3,718,400	17·5	Per cent. 89·67	£ s. d. 2 14 3	14/3
180	48	1,308·71	163·59	3,764,800	17·5	90·79	2 14 11	21/3
180	48	1,291·07	161·39	3,718,400	17·5	89·66	2 14 3	28/3/4
180	(*)39½	1,036·00	129·50	2,984,100	17·5	87·99	2 3 4	11/4/4
190	(*)35	982·32	122·70	2,829,300	17·5	89·81	2 1 3	18/4/4
190	48	1,282·96	160·37	3,695,200	17·5	89·84	2 13 10½	25/4/4
190	47½	1,240·34	155·04	3,573,300	17·5	82·48	2 12 1	2/5/4
190	48	1,327·67	165·96	3,823,800	17·5	87·34	2 15 9	9/5/4
190	48	1,294·03	161·75	3,736,900	17·5	85·36	2 14 6	16/5/4

(*) Holiday weeks.

The sweeping, oiling, cleaning, removal of cloth and cloth picking provided for productions above are weaving time only during the whole week.

FOUR LOOMS SYSTEM.

Average figures for 16 weeks run on four looms.

Total cloth produced in this period on four looms = 72 pieces of 156 yards.

Loom speed.	Hours per week.	Yards woven per week. 4 looms.	Yards per loom per week.	Actual picks per week per loom.	Possible picks per week per loom.	Efficiency.	Average wage per week for four looms.
210.	48	702	175.5	505,440	604,800	Per cent. 83.57	£ s. d. 2 1 6

The sweeping, oiling, cleaning, removal of cloth and cloth picking done by weaver.

Output per weaver comparison:

Average per week of 48 hours, eight looms: 1,293.6 yards.

" " " four looms: 702.0 yards.

Increase in output per weaver on introduction of eight looms system:

591.6 yards per week = 45.73 per cent.

Average weaving cost per yard woven: Eight looms system: 0.504d.

Four looms system: 0.709d.

Average saving in weaving labour cost per yard woven on introduction of eight looms system: 0.205d. = 29.1 per cent.

TABLE IX.

Output per Weaver on Four, Six and Eight Looms Systems.

An attempt is made here to measure the average percentage increase in the output per weaver consequent upon the introduction of the "more looms" system for a group of standard "bulk trade" cloths. The cloths shown are by no means all those which are in constant demand but are some of those upon which the Lancashire industry has been built, and, moreover, are, to our knowledge, being woven at present on "more looms" systems. For convenience of comparison we have set out the loom speeds together with the average efficiencies, both on the old and new systems. Loom efficiencies we have found to vary in accordance with many factors between different mills weaving the same cloths, and even from weaver to weaver in the same mill. Unless a pick-counter is attached to the loom the efficiency cannot be measured with any degree of accuracy, and as few pick-counters are to be found in Lancashire we have had to depend on the figures given to us by the mills visited. Many of these figures have been used in the table appended, whilst others are the average of those supplied. In general, we have found about a 5 per cent. increase in loom efficiency after the introduction of a "more looms" system, and consequently, where we have had no reliable figure at hand for purposes of the table, we have assumed that increase. The loom speeds are, also, in the main, those we have actually found, although some are the average of those found. In this respect it should be noted that several of the mills concerned had increased their loom speeds after the weavers had become accustomed to the new system.

Style.	Coarse Cloth Particulars.	Loom Speed.		Loom Efficiency.		Output per weaver per week of 48 hours.				Medium Cloth and Fine Cloth Particulars.	Loom Speeds.		Loom Efficiency.		Output per weaver per week of 48 hours.			
		4 loom system	6 loom system	4 loom system	6 loom system	4 loom system.		6 loom system.			4 loom system	8 loom system	4 loom system	8 loom system	4 loom system.		8 loom system.	
						Lin. yds.	Sq. yds.	Lin. yds.	Sq. yds.						Lin. yds.	Sq. yds.	Lin. yds.	Sq. yds.
		per cent.	per cent.					per cent.	per cent.									
Printers Bleachers.										29½ ins. 125½ yds. 60/62 36/42	220	185	85	90	1,150	940	2,030	1,670
Shirtings ...										36 ins. 82½ yds. 76/82 80/80	220	185	80	85	688	688	1,230	1,230
										38 ins. 38 yds. 18/16 80/30	220	185	78	80	856	905	1,480	1,560
										30½ ins. 35 yds. 61/64 22/30	230	195	78	80	900	764	1,560	1,320
Drillettes ...	29½ ins. 80 yds. 82/60 11/10	220	195	70	75	985	810	1,400	1,150	40½ ins. 64 yds. 120/76 36/42	220	185	80	85	740	833	1,330	1,500
Drills ...	85 ins. 116 yds. 17/12 18/18	215	190	75	80	1,070	1,040	1,520	1,480									
Double Warp Twill										32 ins. 80 yds. 50/100 2/40/20	230	195	85	90	525	550	1,125	1,000
Baft ...										26½ ins. 27 yds. 64/64 18/24	235	200	80	85	940	690	1,700	1,250
Pocketing	31 ins. 50 yds. 16/17 2/30/2/30	225	200	80	85	847	780	1,200	1,035									
Sateens ...										31 ins. 90 yds. 19/25 38/36	220	185	85	90	600	517	1,065	918
										41 ins. 185 yds. 19/19 36/34	210	180	82	85	725	825	1,290	1,470
										56 ins. 90 yds. 21/30 36/30	195	165	75	82	390	608	725	1,130
Twills, Jeans										38 ins. 116 yds. 64/96 32/18	225	190	78	80	586	620	1,030	1,090
										41 ins. 68 yds. 19/19 36/42	220	185	80	85	733	835	1,330	1,530
Warp Satins.										29½ ins. 90½ yds. 154/76 70/90	220	185	86	90	765	627	1,400	1,150
										28½ ins. 90½ yds. 140/72 50/60	225	190	80	85	800	633	1,430	1,130

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Style.	Coarse Cloth Particulars.	Loom Speed.		Loom Efficiency.		Output per weaver per week of 48 hours.				Medium Cloth and Fine Cloth Particulars.	Loom Speed.		Loom Efficiency.		Output per weaver per week of 48 hours.			
		4 loom system	6 loom system	4 loom system	6 loom system	4 loom system.		6 loom system.			4 loom system	8 loom system	4 loom system	8 loom system	4 loom system.		8 loom system.	
						Lin. yds.	Sq. yds.	Lin. yds.	Sq. yds.						Lin. yds.	Sq. yds.	Lin. yds.	Sq. yds.
Pongees ...				per cent.	per cent.					39 ins. 80½ yds. 80/18 60/80	210	180	85	90	795	862	1,440	1,560
Wincoyettes	88 ins. 120 yds. 60/70 24/16	230	195	72	75	780	800	1,000	1,056									
Jaconettes										42 ins. 25½ yds. 54/90 42/54	220	185	80	85	665	776	1,120	1,310
Lawns Cambrics ...										43 ins. 2/23½ yds. 20/20 44/54	215	182	79	83	680	812	1,210	1,450
										36 ins. 16 yds. 78/60 60/60	220	185	80	85	940	940	1,680	1,680
										42 ins. 58 yds. 74/74 38/44	215	182	82	85	765	893	1,340	1,565
Mook Volles										40 ins. 120 yds. 60/56 50/50	210	190	86	90	1,030	1,140	1,950	2,170
Volles ...										40 ins. 120 yds. 58/54 2/100/2/100	200	185	80	85	950	1,058	1,875	2,080
Brocades* Casements										50 ins. 120 yds. 60/60 36/18	170	160	78	80	705	930	1,385	1,900
Java's ...										49 ins. sp. 118 yds. 74/62 38/36	180	160	75	80	700	955	1,320	2,080
Rayon Waft.										34 ins. 120 yds. 58/48 50/150D	182	165	70	80	850	803	1,760	1,665

* Relatively few "more looms" systems are as yet producing these cloths. There are good grounds, however, for believing that an expansion will follow in the near future.

Several important facts emerge from the table above. In the first place, it is noticeable that the output per weaver varies widely on the four loom organisation. The variation is caused primarily by the wide differences in the number of "picks per inch" in the cloths dealt with and differences in loom speed and loom efficiencies. Also, whilst square yardage produced for any cloth is a function of the linear yardage, it should be borne in mind that for the same cloth the linear production figure slows down as the loom width increases, the speed of the loom being governed by its width. Variations may appear through differences in loom staffing arrangements in different mills. For example, in two mills weaving the same cloth, other things being equal, output per head will be lower in the mill which has the greater number of "learners" on two or three looms. Again, under-employment of weavers (i.e., employment on less than four looms) is more common at some mills than at others.

An inspection of the six and eight looms output per weaver figures shows that the "more looms" system would create still more widely varying figures from mill to mill and cloth to cloth, for whereas much of the coarse trade cannot be catered for with more than six looms per operative, many of the "finer picked" cloths can be woven on a ten looms system. Nevertheless, an examination of the average percentage increases in output per head is important.

Average Percentage "Output per Weaver" Increases.

					<i>Per cent.</i>
Average increase	6 looms over	4 looms:	linear	yardage	... 40
"	"	6	"	4 " square "	... 40
"	"	8	"	4 " linear "	... 84
"	"	8	"	4 " square "	... 84

As an example for ten looms, take the case* of a plain cloth of the following particulars: 29½ ins., 125½ yds., 60/52, 36/42, ring twist, mule left. The figures are:

					<i>Per cent.</i>
Increase	10 looms over	4 looms:	linear	and square yardage	... 122
"	10	"	8	"	... 25

In interpreting these figures in relation to the possible future demand for weaving labour, certain reservations must be borne in mind:

1. It is essential to note that whilst the cloths instanced are typical of those going to form Lancashire's bulk trade, there is no possibility of arriving at even an approximate assessment of the degree in which they may be regarded as typical. There are a host of other "standard" cloths and hundreds of "hybrids" which may now be regarded as included in the bulk trade, for during the past few years the demand for standard cloths has been so fluctuating that many concerns have been modifying their looms in order to weave speciality cloths. These manufactures, deviating from standard cloths, affect output per head taking the industry as a whole.

2. The figures take no account of the many cloths which are in constant demand but which, because of their width or complex structure, cannot be woven on "more looms" systems. The proportion of these cloths in manufacture in Lancashire, whilst not capable of assessment, is certainly of some consequence and would effectively insulate a large body of weavers from the unemployment effects of the "more looms" systems.

* This cloth is being woven in Lancashire on a 10-loom system with the provision of warp stop motions and subsidiary labour. Four loom speed, 220. Efficiency, 85 per cent. Ten loom speed, 185. Efficiency, 90 per cent.

APPENDIX 6.

TABLE I.

Output of Coal in Lancashire and Cheshire and its Relation to Output in Other Fields. 1875-1930.

Average of Years.	Annual Output Lancashire and Cheshire.	Percentage of Col. (b) to Average Annual Output in "Competitive Fields"*	Percentage of Col. (b) to Average Annual Output in Great Britain.†
(a)	000 tons. (b)	000 tons. (c)	(d)
1876-80	18,826	42·8	13·8
1881-85	20,617	40·7	13·0
1886-90	21,943	40·4	12·9
1891-95	21,914	38·4	12·0
1896-1900	24,524	36·8	11·7
1901-05	24,558	33·9	10·7
1906-10	24,816	28·8	9·5
1911-15	23,249	25·2	8·7
1916-20	20,512	23·7	8·6
1922-25†	18,786	19·3	7·3
1927-30†	15,710	16·6	6·3

* The "competitive" coalfields have been taken as: Yorkshire; Derby, Nottingham and Leicester; Stafford, Salop; Worcester and Warwick.

† The years 1921 and 1926 have been omitted because of the prolonged stoppages in those years.

‡ Including particulars for Ireland up to the year 1921.

TABLE II.

Annual Average Output per Person Employed in a Number of Coalfields in Great Britain. 1875-1930.
(Tons.)

Annual Average.*	Lancashire and Cheshire.	Yorks.	Derby.	Notts.	Leicester.	Great Britain.
1876-80 ...	302	266	263	295	228	292
1881-85 ...	315	300	308	338	264	324
1886-90 ...	314	281	302	337	260	315
1891-95 ...	252†	250	260	291	231	271
1896-1900	289	276	309	311	269	292
1901-05 ...	262	259	279	291	263	276
1906-10 ...	250	267	311	307	278	273
1911-15 ...	222‡	256‡	293	294	286‡	251
1916-20 ...	167§	—	258	268	—	220
1922-25||...	180	240	247	223	249	223
1927-30||...	193	254	252	264	255	258

* Simple average of average annual output per head in each of the years in the period.

† Includes only 1891, 2 and 3.

§ Includes only 1919 and 20.

‡ Includes only 1911, 12, 13 and 14.

|| See note † to previous table.

TABLE III.

Output per Man-Shift Worked in Lancashire, Cheshire and North Staffs. and other Coalmining Areas.

(Cwts.)

Quarter ended Dec. 31st.	Lancashire, Cheshire and N. Staffs.	Yorkshire.	Notts and N. Derby.	S. Derby, Leicester, Cannock Chase, Warwick.	Great Britain.
1921 ...	14·46	19·98			17·73
1922 ...	14·79	20·59			18·10
1923 ...	14·89	20·28			17·76
1924 ...	14·42	20·04			17·74
1925 ...	15·06	20·42			18·31
1927* ...	15·97	21·84	22·92	19·40	20·47
1928 ...	17·57	23·21	24·42	21·06	21·80
1929 ...	17·73	23·71	24·41	21·43	21·78
1930* ...	17·12	23·28	24·23	20·95	21·34

* 3rd quarter.

TABLE IV.

Annual Average Total Costs of Production (including wages) per Ton of Coal Disposable Commercially in Certain Coalmining Areas.

Quarter ended Dec. 31st.	Lancashire, Cheshire and N. Staffordshire.	1927 =100.	COMPETITIVE FIELDS.						Great Britain.	1927 =100.
			Yorkshire.	1927 =100.	N. Derby and Notts.	1927 =100.	S. Derbyshire, Leicester, Cannock Chase and Warwick.	1927 =100.		
1921	s. d. 25 7½	142·5	s. d. 22 11½						s. d. 22 8½	152·7
1922	19 4½	107·6	15 3½						16 11½	114·1
1923	18 3½	101·6	15 9						17 11½	120·6
1924	21 1½	117·5	16 8						18 4½	123·4
1925*	20 3	112·6	15 9½						17 5½	117·2
1927	17 11½	100	s. d. 14 5½	100	14 1½	100	s. d. 15 9½	100	14 10½	100
1928	17 1	95·0	13 5½	93·2	13 0½	92·3	14 6	91·8	13 8½	92·3
1929	16 4½	91·1	12 8½	88·0	12 9½	90·6	14 2½	89·8	13 3½	89·5
1930	16 5½	91·5	12 9½	88·6	12 6½	88·5	13 10½	87·7	13 7½	91·6

* Including subvention.

TABLE V.

*Balance between Proceeds and Costs per Ton of Coal Disposable Commercially
in certain Coalmining Areas.*

	Lancashire, Cheshire and North Staffs.	Yorkshire.	North Derbyshire and Notts.	South Derbyshire, Leicester, etc.	Great Britain.
<i>1921.</i>	s. d.	s. d.	s. d.	s. d.	s. d.
4th Qtr. ...	+ 1 4		+ 1 9		+ 3½
<i>1922.</i>					
1st Qtr. ...	+ 1 5½		+ 1 8		+ 1 1½
2nd „ ...	— 8½		— 3½		— 0½
3rd „ ...	— 9		+ 1 7½		+ 1 1
4th „ ...	+ 0½		+ 2 1½		+ 1 6½
<i>1923.</i>					
1st Qtr. ...	+ 11		+ 2 7½		+ 1 5½
2nd „ ...	+ 9		+ 2 8½		+ 3 2½
3rd „ ...	— 10½		+ 1 3½		+ 1 0½
4th „ ...	+ 1 3½		+ 2 9½		+ 1 11½
<i>1924.</i>					
1st Qtr. ...	+ 2 6½		+ 2 9½		+ 2 9½
2nd „ ...	+ 6		+ 1 8½		+ 1 0½
3rd „ ...	— 1 0½		+ 10½		+ 0½
4th „ ...	+ 0½		+ 2 0		+ 7½
<i>1925.</i>					
1st Qtr. ...	+ 8		+ 1 7½		+ 6
2nd „ ...	— 1 2½		— 3½		— 11½
<i>1927.</i>					
1st Qtr. ...	+ 1 6½	+ 2 0½	+ 2 4½	+ 5 1½	+ 1 2½
2nd „ ...	— 1 4½	— 3½	— 1 10½	— 1 4½	— 1 0½
3rd „ ...	— 1 7½	— 7½	— 1 3½	— 6½	— 1 2
4th „ ...	— 1 0½	— 10½	— 7½	— 7	— 1 0½
<i>1928.</i>					
1st Qtr. ...	— 10½	— 6½	— 5½	— 0½	— 0 9½
2nd „ ...	— 2 0½	— 1 9	— 1 4½	— 1 2½	— 1 5
3rd „ ...	— 2 7½	— 1 4	— 9½	— 8½	— 1 4½
4th „ ...	— 5½	— 2	+ 5½	+ 9½	— 0 3
<i>1929.</i>					
1st Qtr. ...	+ 9½	+ 1 0½	+ 1 6½	+ 2 9½	+ 9½
2nd „ ...	— 11	— 2	— 6½	— 4	— 3½
3rd „ ...	— 1 2	+ 1½	+ 3	+ 5½	— 0½
4th „ ...	+ 7½	+ 1 3½	+ 1 2½	+ 1 6	+ 11½
<i>1930.</i>					
1st Qtr. ...	+ 1 1½	+ 1 7½	+ 1 6½	+ 1 11½	+ 1 1½
2nd „ ...	— 10½	— 0½	— 5	— 3	— 2
3rd „ ...	— 1 3½	— 2½	— 1½	+ 4½	— 2½
4th „ ...	— 7	+ 10½	+ 1 2½	+ 1 6	+ 6½

TABLE VI.

*Average Proceeds * per Ton of Coal Disposable Commercially in Lancashire and Cheshire and other Coalfields.*

Quarter ended Dec. 31st.	Lancashire, Cheshire and N. Staffs.	Yorkshire.	N. Derby and Notts.	S. Derby, Leicester and Warwick etc.	Great Britain.
	s. d.		s. d.		s. d.
1921 ...	27 1½		24 8½		23 0
1922 ...	19 4½		17 5½		18 6½
1923 ...	19 7		18 6½		19 10½
1924 ...	21 2½		18 8		19 0
1925 ...	19 3½		15 11½		15 11½
	s. d.	s. d.	s. d.	s. d.	
1927 ...	16 11½	13 6½	13 6½	15 2½	13 10
1928 ...	16 7½	13 3½	13 6½	15 3½	13 5½
1929 ...	17 0	14 0	14 0¼	15 8¼	14 3
1930 ...	17 0½	13 7½	13 8½	15 4¼	14 1½

* Proceeds after deduction of selling and delivery expenses.

TABLE VII.

Net Selling Value per Ton of Coal Raised in Lancashire and Cheshire and other Coalfields.

Year.	Lancashire and Cheshire.	Yorkshire, S.	Yorkshire, W.	Notts.	Derby, N.	Derby, S.	Staffs., N.	England and Wales.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
1921 ...	28 11·32	26 2·86	27 0·11	25 8·85	26 3·41	26 5·31	23 2·18	26 5·92
1922 ...	19 5·30	17 4·49	18 5·74	16 8·66	17 2·35	16 11·80	19 1·11	17 11·95
1923 ...	18 3·38	17 8·34	18 1·43	16 11·78	16 9·44	15 2·70	18 0·98	18 10·48
1924 ...	19 10·65	18 1·13	18 8·46	17 11·12	17 8·42	17 2·85	19 7·26	19 0·77
1925 ...	19 0·50	15 7·82	16 11·03	15 2·49	15 5·59	15 2·80	19 2·58	16 8·45
1928 ...	15 7·20	12 4·86	13 6·07	12 2·13	12 5·35	12 4·02	15 3·75	13 0·94
1929 ...	15 11·71	13 0·51	14 0·00	12 7·94	12 11·48	12 10·08	15 7·26	13 7·77
1930 ...	15 11·38	12 11·67	13 11·41	12 7·15	12 11·57	12 8·13	15 5·57	13 9·96

TABLE VIII.

Average Weekly Tonnage of Coal Raised in "Lancashire, Cheshire and North Wales" and Other Coalmining Areas.*

	* Lancashire, Cheshire and N. Wales.	Percentage of Col. (a) to Total for Competitive Fields.†	Percentage of Col. (a) to Total for Great Britain.
	(a)	(b)	(c)
1928	357,960	20·4	7·7
1929	371,423	19·9	7·4
1930	358,029	19·7	7·5
1931.			
1st Quarter	376,400	20·2	8·2
2nd "	329,792	20·5	7·8
3rd "	299,885	18·9	7·6

* North Wales, in 1930, had an output of 22 per cent. of that of Lancashire and Cheshire.

† Yorkshire; Derby, Notts. and Leicester; Stafford, Salop, Worcester, Warwick.

TABLE IX.

Number of Collieries at Work in Lancashire and Cheshire.

1900	466	1925	234
1913	412	1926	247
1921	286	1928	217
1922	267	1929	210
1923	253	1930	198
1924	242		

APPENDIX 7.

TRADE BOARD WAGE RATES IN CERTAIN CLOTHING TRADES.
Ready Made Wholesale Bespoke Tailoring Trade.

FEMALE LEARNERS.

	Learners Commencing at			
	14 and under 15 years of age.		15 and under 16 years of age.	
	Column I.		Column II.	
	Per week of 48 Hours.	Per Hour.	Per week of 48 Hours.	Per Hour.
During 1st six months of employment	s. d.	d.	s. d.	d.
" 2nd " " " "	6 6	1½	8 0	2
" 3rd " " " "	8 0	2	9 0	2½
" 4th " " " "	11 0	2½	12 0	3
" 5th " " " "	12 0	3	17 0	4½
" 6th " " " "	16 0	4	20 0	5
" 7th " " " "	18 0	4½	25 0†	6½†
" 8th " " " "	22 0	5½	—	—
" 8th " " " "	25 0†	6½†	—	—
	16 and under 18 years of age.*		18 and under 21 years of age.	
	Column III.		Column IV.	
	Per week of 48 Hours.	Per Hour.	Per week of 48 Hours.	Per Hour.
	During 1st six months of employment	s. d.	d.	s. d.
" 2nd " " " "	9 0	2½	12 0	3
" 3rd " " " "	12 0	3	17 0	4½
" 4th " " " "	16 0	4	20 0	5
" 4th " " " "	18 0†	4½†	25 0†	6½†
	21 years of age and over.			
	Column V.			
	Per week of 48 Hours.		Per Hour.	
	During 1st three months of employment	s. d.	d.	s. d.
" 2nd " " " "	...	...	13 0	3½
" 3rd " " " "	...	...	17 0	4½
" 4th " " " "	...	...	22 0	5½
" 4th " " " "	...	...	25 0	6½

* Notwithstanding the provisions of sub-paragraph (1) of the Proviso to this Paragraph, learners commencing at 16 and under 18 years of age shall, on attaining the age of 18 years, be entitled during the remainder of their learnership period to receive 5s. per week of 48 hours, i.e. 1½d. per hour in addition to the General Minimum Time Rate applicable, as set out in Column II above.

† These minimum rates shall continue to be payable until the learner ceases to be a Learner under the Provisions of sub-Paragraph (2) of the Proviso to this Paragraph.

Provided that:

(1) The advances to be given to learners commencing at under 21 years of age shall become due as from the first Monday in January and July of each year, the Learner being entitled to her first advance on the first Monday in January or July as the case may be, provided that she has been in the trade at least three months.

(2) A learner shall cease to be a learner and be entitled to the full General Minimum Time-Rate applicable to her under Paragraph 1 or 2 upon the fulfilment of the conditions appropriate to her as set out below:—

<i>Age upon Entering Employment.</i>	<i>Conditions.</i>
Under 15 years	The completion of not less than three years' employment and the attainment of the age of 18 years.
15 and under 16 years of age...	The completion of not less than two years' employment and the attainment of the age of 18 years.
16 and under 21 years of age...	The completion of two years' employment.
21 years and over	The completion of one year's employment.

(3) No female learner shall be held to be entitled to the full General Minimum Rate under Paragraph 1 or 2 until she has attained the age of 18 years, notwithstanding any employment she may have had.

(4) In determining the age of entry and length of employment, all service prior to the age of 14 shall be disregarded.

Shirtmaking Trade.

A Female Learner is a Worker who:—

(a) Is employed during the whole or substantial part of her time in learning any branch or process of the trade by an employer who provides the learner with reasonable facilities for such learning; and

(b) Has received a certificate or has been registered in accordance with rules from time to time laid down by the Trade Board, or has made application for such certificate or registration which has been duly acknowledged and is still under consideration.

Provided that the certificate or registration of a Learner may be cancelled if other conditions of Learnership are not complied with.

Provided that an employer may employ a Female Learner on her first employment, in a branch or branches of the trade specified in Part V of this Schedule, without a certificate or registration for a probation period not exceeding four weeks, but the probation period shall be included in her period of Learnership.

Provided that, notwithstanding compliance with the conditions contained in this Section, a person shall not be deemed to be a Learner if she works in a room used for dwelling purposes and is not in the employment of her parent or guardian.

Shirtmaking Trade.
FEMALE LEARNERS.

	Learners commencing at			
	14 and under 15 years of age.		15 and under 16 years of age.	
	Column I.		Column II.	
	Per week of 48 Hours.	Per Hour.	Per week of 48 Hours.	Per Hour.
During 1st six months of employment after the age of 14.	s. d. 6 6	d. 1½	s. d. 8 0	d. 2
Do. 2nd Do. Do.	8 0	2	9 0	2½
Do. 3rd Do. Do.	11 0	2½	12 0	3
Do. 4th Do. Do.	12 0	3	17 0	4½
Do. 5th Do. Do.	16 0	4	20 0	5
Do. 6th Do. Do.	18 0	4½	25 0†	6¼†
Do. 7th Do. Do.	22 0	5½	—	—
Do. 8th Do. Do.	25 0	6¼	—	—
	16 and under 18 years of age.*		18 and under 21 years of age.	
	Column III.		Column IV.	
	Per week of 48 Hours.	Per Hour.	Per week of 48 Hours.	Per Hour.
During 1st six months of employment	s. d. 9 0	d. 2½	s. d. 12 0	d. 3
" 2nd " " " "	12 0	3	17 0	4½
" 3rd " " " "	16 0	4	20 0	5
" 4th " " " "	18 0	4½	25 0	6¼
	21 years of age or over.			
	Column V.			
	Per week of 48 Hours.		Per Hour.	
During 1st three months of employment	s. d. 13 0	d. 3½		
" 2nd " " " "	17 0	4½		
" 3rd " " " "	22 0	5½		
" 4th " " " "	25 0	6¼		

* Notwithstanding the provisions of Sub-section (1) of the Proviso to this section a Learner commencing at 16 and under 18 years of age shall, on attaining the age of 18 years, be entitled during the remainder of her learnership period to receive 5s. per week of 48 hours, i.e., 1½d. per hour in addition to the General Minimum Time Rate applicable as set out in Column III above.

† These minimum rates shall continue to be payable until the Learner ceases to be a Learner under the provisions of Sub-section (2) of the Proviso of this section

Dressmaking and Women's Light Clothing Trade.

LEARNERS.

	Area A.*		Area B.*		Area C.*	
	Per week of 48 Hours.	Per Hour.	Per week of 48 Hours.	Per Hour.	Per week of 48 Hours.	Per Hour.
During 1st year of employment in the Retail Bespoke Dressmaking Branch of the Trade.	s. d. 5 0†	d. 1½	s. d. 6 0†	d. 1½	s. d. 6 0	d. 1½
Do. 2nd Do. Do.	9 0	2¼	12 0†	3	12 0	3
Do. 3rd Do. Do.	14 0	3½	18 0†	4½	18 0	4½
Do. 4th Do. Do.	20 0	5	25 0†	6¼	25 0	6¼

Note. If the conditions of learnership specified in Section II of Part I of Schedule III (W.D.(20)) are not complied with, the minimum rate applicable is that set out in section II of this part of the Schedule.

* For definitions of Areas, see Section IV of Part I of this Schedule.

† These Minimum Rates are effective as from 10th April, 1922.

DEFINITIONS, CONDITIONS, AND PROVISIONS GOVERNING THE APPLICATION OF THE MINIMUM RATES OF WAGES EFFECTIVE IN THE TRADE UNDER THE TRADE BOARDS ACT.

PART I.

Definitions.

For the Purpose of the Application of the Minimum Rates of Wages Fixed by the Trade Board.

Section I.—The Retail Bespoke Dressmaking branch of the trade is that branch of the Dressmaking and Women's Light Clothing trade specified in the regulation made by the Minister of Labour dated 24th November, 1919 (as varied by the Trade Boards (Shirtmaking) Order 1920) and as set out in Part IV of this schedule, in which the employer supplies the garment direct to the individual wearer and employs the worker direct.

Section II.—A Female Learner is a worker who:—

(a) Is employed by an employer who provides her with reasonable facilities for practically and efficiently learning one of the branches of the Trade, or the various processes involved in the making of any of the articles specified in the definition of the Trade set out in Part IV of this schedule; and

(b) Has received a certificate or has been registered in accordance with rules from time to time laid down by the Trade Board, or has made application for such certificate or registration which has been duly acknowledged and is still under consideration. Provided that the certification or registration of a Learner may be cancelled if the other conditions of learnership are not complied with.

Provided that an employer may employ a Female Learner on her first employment without a certificate or registration for a probation period not exceeding four weeks, but in the event of such a learner being continued thereafter at her employment, the probation period shall be included in her period of learnership.

Section III.—A Home worker is a worker who works in her own home or in any place not under the control or management of the employer.

PART II.

Provisions relating to the Minimum Rates of Wages for Female Learners.

(1) The advances to be given to a learner shall become due on the completion of each 12 months of employment in (a) the Retail Bespoke Dressmaking branch of the trade or (b) any branch of the trade other than the Retail Bespoke Dressmaking branch.

(2) A learner shall cease to be a learner and be entitled to the General Minimum Time Rate applicable to workers other than learners on the completion of 4 years of employment in (a) the Retail Bespoke Dressmaking branch of the trade or (b) any branch of the trade other than the Retail Bespoke Dressmaking branch.

(3) For the purpose of the minimum rates for female learners and the provisions relating thereto, a worker who has had employment in the Retail Bespoke Dressmaking branch of the trade shall be entitled to count half the period of such employment as employment in any branch of the trade other than the Retail Bespoke Dressmaking branch and a worker who has had employment in any branch of the trade other than the Retail Bespoke Dressmaking branch shall be entitled to count half the period of such employment as employment in the Retail Bespoke Dressmaking branch.

Hats, Caps, and Millinery Trade.

<i>Female Learners.</i>	<i>Per Hour.</i>	<i>Per Week of</i>	
		<i>48 Hours.</i>	
		<i>d.</i>	<i>s. d.</i>
During 1st year of employment	1½	6	0
„ 2nd „ „ „ „ „ „ „ „ „ „	3	12	0
„ 3rd „ „ „ „ „ „ „ „ „ „	4½	18	0
„ 4th „ „ „ „ „ „ „ „ „ „	6½	25	0

The General Minimum Time Rates for Learners set out in Paragraph (8) are subject to the following conditions:—

(a) The advances shall become due on the completion of each 12 months' employment in the trade.

(b) A learner shall cease to be a learner and be entitled to the full General Minimum Time Rate applicable to female workers other than learner upon completion of 4 years' employment in the trade.

(c) If the conditions set out in Paragraph (21) of this Schedule are not complied with, the General Minimum Time Rate applicable is that for female workers other than learners set out in Paragraph (7).

(d) A female worker who enters or who has entered the trade for the first time at 18 years of age or over shall be deemed, for the purpose of the application of Minimum Rates of Wages fixed by the Trade Board, and the calculation of the period of learnership, to have completed one year's employment as a learner.

Paragraph 21.

A female learner is a worker who:—

(a) is employed during the whole or a substantial part of her time in learning any branch or process of the trade specified in Paragraph 22 of this Schedule by an employer who provides the learner with reasonable facilities for such learning, and

(b) has received a certificate in accordance with rules from time to time laid down by the Trade Board, and held subject to compliance with conditions specified in this section, or has made application for such certificate which has been duly acknowledged and is still under consideration. Provided that the certification of a learner may be cancelled if the other conditions of learnership are not complied with.

Provided that an employer may employ a female learner on her first employment without a certificate for a probation period not exceeding four weeks, but in the event of such a learner being continued thereafter at her employment the probation period shall be included in her period of learnership.

APPENDIX 8.

TABLE I.

Lancashire and parts of Cheshire and Derbyshire.
Numbers of Occupied Persons in Various Branches of Distribution, 1921.

Type of Dealing.	Males.	Females.	Total.	
			Numbers.	Percentage of Total.
Grocery and Provisions—				
Wholesale	5,914	2,204	8,118	2·8
Retail	20,562	12,760	33,322	11·5
Departmental Stores, General Stores, etc.	20,543	12,011	32,554	11·2
Textiles and Clothing (wholesale)	24,910	6,295	31,205	10·7
Drapery, Hosiery, etc. (retail) ...	9,664	19,905	29,569	10·2
General and Export Trading Non-Textile Packing.	16,994	5,491	22,485	7·7
Meat (retail)	12,203	2,339	14,542	5·0
Coal	11,373	651	12,024	4·1
Vegetables (wholesale)	3,772	466	4,238	1·5
„ (retail)	6,489	4,342	10,831	3·7
Books, Newspapers, etc. (retail) ...	4,092	3,216	7,308	2·5
Metals, Tools (wholesale)	5,165	1,129	6,294	2·2
„ „ (retail)	3,809	1,653	5,462	1·9
Milk and Dairy Products (retail)	4,009	1,670	5,679	2·0
Sugar Confectionery (retail) ...	1,358	4,537	5,895	2·0
Furniture	4,436	1,409	5,845	2·0
Drugs, etc. (retail)	3,726	1,695	5,421	1·9
Boots and Shoes (retail)	2,686	2,370	5,056	1·7
Drysaltery, oils, etc. (wholesale) ...	3,838	847	4,685	1·6
Fish and Poultry (retail)	3,122	1,175	4,297	1·5
Tobacco (retail)	1,468	1,969	3,437	1·2
Grain and Forage	3,008	489	3,497	1·2
Others	20,979	8,064	29,043	9·9
Total	194,120	96,687	290,807	100·0

TABLE II.
Survey Region.
Estimated Number of Persons Insured, Unemployed and Employed in Distribution, 1923-31.

Year.	Number of Persons Insured.					Unemployed*					Number of Persons Employed.				
	Men.	Boys.	Women	Girls.	Total.	Men.	Boys.	Women	Girls.	Total.	Men.	Boys.	Women	Girls.	Total.
1923 ...	67,990	7,620	33,780	4,870	114,260	4,499	241	1,928	146	6,814	63,491	7,379	31,852	4,724	107,446
1924 ...	68,920	8,880	35,700	5,900	119,400	4,564	199	2,542	140	7,445	64,356	8,681	33,158	5,760	111,955
1927 ...	80,170	8,750	44,010	5,720	138,650	4,830	163	2,112	134	7,239	75,340	8,587	41,898	5,586	131,411
1929 ...	82,970	9,010	45,710	6,340	144,030	6,584	266	2,998	177	10,025	76,386	8,744	42,712	6,163	134,005
1930 ...	86,580	10,400	48,210	6,620	151,810	10,987	499	6,040	302	17,828	75,593	9,901	42,170	6,318	133,982
1931 ...	93,030	10,570	51,260	7,430	162,290	14,587	720	7,896	369	23,572	78,443	9,850	43,364	7,061	138,718

* For 1923 average taken for June, September and December. For 1924, 27, 29 and 30 average taken for March, June, September and December. For 1931, average of March, June, September. No allowance for exclusion of those over 65 years of age in 1929, 30, 31.

TABLE III.

*Survey Region.**Index of Numbers of Insured Employed Persons in Distributive Trades in each Sub-Area.**

<i>Sub-Area.</i>	1923.	1924.	1927.	1929.	1930.
Blackburn, Darwen, Accrington, etc.	100	115·1	115·6	132·0	123·0
Bacup, Rawtenstall, etc. ...	100	101·1	105·4	113·6	115·1
Oldham, Mossley, etc. ...	100	118·9	150·0	156·4	161·7
Bury, Littleborough, etc. ...	100	104·3	138·6	135·2	132·8
Stalybridge, Hyde, Stockport, etc.	100	110·1	137·4	143·8	141·8
Bolton, Leigh, etc. ...	100	109·0	121·5	125·0	123·4
Atherton, Wigan, etc. ...	100	106·2	126·9	134·4	136·1
St. Helens, Runcorn, etc. ...	100	106·7	134·1	141·1	146·4
Chorley, Preston ...	100	124·5	189·9	154·4	167·8
Trafford Park, Salford, etc. ...	100	104·7	139·2	147·5	142·2
Lancaster, Fleetwood, etc. ...	100	116·3	143·4	150·6	157·0
Burnley, Nelson, Colne ...	100	113·5	145·2	154·3	146·9
Manchester, Denton, etc. ...	100	98·6	109·8	110·5	110·8

* See notes to Table II.

TABLE IV.

*Survey Region.**Percentage Distribution of Insured Employed Persons in Distributive Trades between Different Sub-Areas, 1930.*

<i>Sub-Area.</i>	<i>Percentage.</i>	<i>Sub-Area.</i>	<i>Percentage.</i>
Blackburn, Darwen, etc. ...	4·8	St. Helens, Runcorn, etc. ...	5·3
Bacup, Rawtenstall, etc. ...	0·7	Chorley, Preston ...	3·8
Oldham, Mossley, etc. ...	3·6	Trafford Park, etc. ...	7·0
Bury, Littleborough, etc. ...	3·9	Lancaster, etc. ...	5·8
Stalybridge, Hyde, etc. ...	5·5	Burnley, Colne, Nelson ...	3·0
Bolton, Leigh, etc. ...	5·4	Manchester, Denton, etc. ...	48·0
Atherton, Wigan, etc. ...	3·2		
		Total ...	100·0

TABLE V.

*Survey Region.**Percentage Distribution of Insured Employed Persons by Sex and Age.*

<i>Year.</i>	<i>Men.</i> per cent.	<i>Boys.</i> per cent.	<i>Women.</i> per cent.	<i>Girls.</i> per cent.	<i>Total.</i> per cent.
1923 ...	59·1	6·9	29·6	4·4	100
1930 ...	56·4	7·4	31·5	4·7	100

TABLE VI.

*Survey Region.**Percentage Unemployment among Insured Persons in the Distributive Trades, 1923-31.*

<i>Year.</i>	<i>Men.</i> per cent.	<i>Boys.</i> per cent.	<i>Women.</i> per cent.	<i>Girls.</i> per cent.	<i>Total.</i> per cent.
1923 ...	6·6	3·2	5·7	3·0	6·0
1924 ...	6·6	2·2	7·1	2·4	6·2
1927 ...	6·0	1·9	4·8	2·3	5·2
1929 ...	7·9	3·0	6·6	2·8	7·0
1930 ...	12·7	4·8	12·5	4·6	11·7
1931 ...	15·7	6·8	15·4	5·0	14·5

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TABLE VII.

Numbers and Percentages of New Entrants and of Wastage in Distributive Trades in the N.W. Division. 1923-30.

Year.	Males.				Females.				Total.			
	New Entrants (July to June).		Wastage.		New Entrants (July to June).		Wastage.		New Entrants (July to June).		Wastage.	
	Numbers	Per- centage of Insured Males.	Numbers.	Per- centage of Insured Males.	Numbers.	Per- centage of Insured Females.	Numbers.	Per- centage of Insured Females.	Numbers.	Per- centage of Total Insured.	Numbers.	Per- centage of Total Insured.
1923-4 ...	14,678	11·8	13,408	10·8	11,501	16·1	5,761	8·1	26,179	13·4	19,169	9·8
1924-5 ...	15,574	12·4	4,034	3·2	12,609	16·3	6,559	8·5	28,183	13·9	10,593	5·2
1925-6 ...	13,175	9·6	6,495	4·7	11,833	14·2	9,723	11·7	25,008	11·3	16,218	7·4
1926-7 ...	13,507	9·4	9,397	6·5	12,480	14·6	11,670	13·7	25,987	11·3	21,067	9·2
1927-8 ...	12,865	8·7	12,985	8·8	11,370	13·2	6,390	7·4	24,235	10·3	19,375	8·3
1928-9 ...	13,626	9·2	5,486	3·7	11,468	12·6	8,098	8·9	25,094	10·5	13,584	5·7
1929-30 ...	14,114	9·0	824	0·5	11,656	12·3	3,476	3·7	25,770	10·3	4,300	1·7

APPENDIX 9A.

Electricity Supply.

TABLE I.*

Number of Staff and Workmen Employed by Authorised Undertakers in Great Britain.†

Year.	Local Authorities.				Companies.				All Authorised Undertakers.			
	Genera- tion.	Distribu- tion.	Adminis- tration.	Total.	Genera- tion.	Distribu- tion.	Adminis- tration.	Total.	Genera- tion.	Distribu- tion.	Adminis- tration.	Total.
1922-23 ...	11,050	9,449	3,361	23,860	5,280	4,977	2,242	12,499	16,330	14,426	5,603	36,359
1923-24 ...	—	—	—	—	—	—	—	—	—	—	—	—
1924-25 ...	11,580	11,384	3,899	26,863	5,788	5,977	2,764	14,529	17,368	17,361	6,663	41,392
1925-26 ...	11,634	13,387	4,151	29,172	6,172	6,845	3,095	16,112	17,806	20,232	7,246	45,284
1926-27 ...	11,824	14,567	4,388	30,779	6,483	8,124	3,317	17,924	18,307	22,691	7,705	48,703
1927-28 ...	12,166	16,245	4,799	33,210	6,603	8,472	3,580	18,655	18,769	24,717	8,379	51,865
1928-29 ...	12,138	19,649	5,122	36,909	6,208	9,536	4,088	19,832	18,346	29,185	9,210	56,741
1929-30 ...	12,401	21,355	5,569	39,325	6,342	11,381	4,572	22,295	18,743	32,736	10,141	61,620

Source :—Annual Return of Engineering and Financial Statistics. Electricity Commission.

* Information is not available for the years prior to 1922-23, or for the year 1923-24. The year of return is almost invariably April 1st to March 31st for Local Authorities, and the calendar year for Companies,

† See p. 237.

TABLE II.

*Growth of Sales of Units of Electricity for Different Purposes in Great Britain and in the Survey Region, 1920-21 to 1929-30.**

(1920-21 = 100.)

Year.	Lighting and Domestic Sales.		Public Lighting Sales.		Traction Sales.		Power Sales.		Total Sales to Consumers.		
	Great Britain.	Survey Region.	Great Britain.	Survey Region.	Great Britain.	Survey Region.	Great Britain.	Survey Region.	Great Britain.	Survey Region.	
1920-21	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1921-22	104.3	106.9	104.5	127.5	95.3	98.8	84.2	87.0	88.9	91.1	91.1
1922-23	122.1	128.0	124.3	160.3	102.3	104.1	102.0	111.2	107.1	112.0	112.0
1923-24	153.2	157.2	143.5	216.1	110.6	109.8	123.6	131.6	127.2	131.2	131.2
1924-25	178.3	181.9	166.1	277.2	118.5	114.8	141.3	152.5	145.1	150.2	150.2
1925-26	213.8	224.4	184.7	357.0	135.8	121.6	150.5	168.5	159.6	167.7	167.7
1926-27	247.9	268.9	198.3	398.4	148.9	121.1	150.8	169.7	167.1	173.3	173.3
1927-28	293.4	320.2	235.3	510.0	170.7	131.6	181.6	195.7	199.4	199.9	199.9
1928-29	349.7	377.2	263.1	578.1	188.3	131.5	197.1	206.4	222.1	213.9	213.9
1929-30	402.6	415.7	296.5	627.6	204.2	132.0	216.4	221.2	246.7	229.0	229.0

* See p. 241.

TABLE III.

*Sales of Electricity to Consumers for Different Purposes in Each Year 1920-21 to 1929-30 in the Survey Region expressed as a percentage of the corresponding sales in Great Britain.**

Year.	Lighting and Domestic Sales.	Public Lighting Sales.	Traction Sales.	Power Sales.	Total Sales to Consumers.
	Percentage.	Percentage.	Percentage.	Percentage.	Percentage.
1920-21 ...	9·7	6·3	23·5	16·4	15·8
1921-22 ...	10·0	7·7	24·4	16·9	16·3
1922-23 ...	10·2	8·2	24·0	17·8	16·6
1923-24 ...	10·0	9·5	23·4	17·4	16·4
1924-25 ...	9·9	10·5	22·8	17·7	16·4
1925-26 ...	10·2	12·2	21·1	18·3	16·7
1926-27 ...	10·5	12·7	19·1	18·4	16·5
1927-28 ...	10·6	13·7	18·1	17·6	15·9
1928-29 ...	10·8	13·9	16·4	17·1	15·3
1929-30 ...	10·0	13·4	15·2	16·7	14·7

* See page 241.

TABLE IV.

*Indices showing the relative importance of sales of Electricity in units for lighting and domestic purposes and sales for power purposes in Great Britain and the Survey Region respectively in each year 1920-21 to 1929-30.**

Year.	Sales for lighting and domestic purposes expressed as a percentage of total sales to consumers.		Sales for power purposes expressed as a percentage of total sales to consumers.		Sales for lighting and domestic purposes expressed as a percentage of sales for power purposes.	
	Great Britain.	Survey Region.	Great Britain.	Survey Region.	Great Britain.	Survey Region.
1920-21 ...	16·6	10·2	71·2	73·4	23·3	13·8
1921-22 ...	19·4	11·9	67·4	70·1	28·8	17·0
1922-23 ...	18·9	11·6	67·7	72·8	27·9	15·9
1923-24 ...	20·0	12·2	69·1	73·6	28·9	16·5
1924-25 ...	20·4	12·3	69·3	74·5	29·4	16·5
1925-26 ...	22·2	13·6	67·1	73·7	33·1	18·4
1926-27 ...	24·6	15·8	64·2	71·8	38·3	21·9
1927-28 ...	24·4	16·3	64·8	71·8	37·6	22·7
1928-29 ...	26·1	17·9	63·2	70·8	41·3	25·3
1929-30 ...	27·0	18·4	62·4	70·9	43·3	26·1

* See page 241.

TABLE V.

Trend of average revenue per unit obtained by authorised undertakers for Electricity sold to consumers in Great Britain and the Survey Region respectively.

1921-22 to 1929-30.*

(1921-22 = 100.)

Year.	Lighting and Domestic Sales.		Power Sales.		Total Sales to Consumers.	
	Great Britain.	Survey Region.	Great Britain.	Survey Region.	Great Britain.	Survey Region.
1921-22 ...	100.0	100.0	100.0	100.0	100.0	100.0
1922-23 ...	92.2	92.2	76.9	75.7	83.5	82.7
1923-24 ...	78.6	88.1	67.5	74.3	75.0	75.0
1924-25 ...	73.0	79.8	63.3	68.4	70.6	69.7
1925-26 ...	66.4	71.2	59.2	61.8	66.5	61.1
1926-27 ...	61.7	65.8	67.5	75.0	71.0	68.3
1927-28 ...	59.0	60.7	55.6	58.1	62.5	58.2
1928-29 ...	53.0	55.6	50.9	55.1	58.1	55.8
1929-30 ...	49.7	52.4	48.5	53.7	55.6	54.3

* See p. 245.

TABLE VI.

*Average revenue per unit obtained by authorised undertakers in the Survey Region for Electricity sold to consumers for different purposes, expressed as a percentage of the corresponding average revenue per unit obtained in Great Britain, in each year 1921-22 to 1929-30.**

Year.	Lighting and Domestic Sales.	Power Sales.	Total Sales to Consumers.
	Percentage.	Percentage.	Percentage.
1921-22 ...	88.9	80.5	83.9
1922-23 ...	88.9	79.2	83.1
1923-24 ...	99.6	88.6	83.9
1924-25 ...	97.1	86.9	82.9
1925-26 ...	95.3	84.0	77.0
1926-27 ...	94.6	89.5	80.7
1927-28 ...	91.4	84.0	78.1
1928-29 ...	93.1	87.2	80.6
1929-30 ...	93.7	89.0	81.9

* See p. 245.

TABLE VII.

Lighting and Domestic Supplies. Year 1929-30.

<i>Name of Undertaker.</i>	<i>Average Revenue per unit sold (in pence).</i>
Urban Electric Supply Co. (Glossop Undertaking)	7.60
Alderley Edge and Wilmslow Electricity Board	6.64
Ashton-in-Makerfield U.D.C.	5.68
Preesall U.D.C.	5.03
Horwich U.D.C.	4.96
Newton-in-Makerfield U.D.C.	4.59
Rochdale Corporation	1.86
Milnrow U.D.C.	2.08
Sale U.D.C.	2.18
British Insulated Cables Ltd. (Prescot Undertaking) ...	2.19
Salford Corporation	2.28
Accrington Corporation	2.32
Blackburn Corporation (C.B.)	4.38
Blackpool Corporation (C.B.)	2.32
Bolton Corporation (C.B.)	2.76
Burnley Corporation (C.B.)	2.78
Bury Corporation (C.B.)	2.86
Manchester Corporation (C.B.)	2.72
Oldham Corporation (C.B.)	3.62
Preston Corporation (C.B.)	2.40
Rochdale Corporation (C.B.)	1.86
St. Helens Corporation (C.B.)	2.95
Salford Corporation (C.B.)... ..	2.28
Stockport Corporation (C.B.)	2.96
Warrington Corporation (C.B.)	2.89
Wigan Corporation (C.B.)	3.15
<hr/>	
The Survey Region as a Whole	2.68

Power Supplies. Year 1929-30.

Urban Electric Supply Co. (Glossop Undertaking)	3.88*
Alderley Edge and Wilmslow Electricity Board	2.89
Padiham U.D.C.	2.38
Hindley U.D.C.	2.20
Preesall U.D.C.	2.10
Turton U.D.C.	1.91
Stalybridge, Hyde, Mossley and Dukinfield Tramways and Electricity Board	0.55
Oldham Corporation... ..	0.59
Stretford and District Electricity Board	0.60
Mersey Power Co., Ltd.	0.62*
Lancashire Electric Power Company	0.67
Atherton U.D.C.	0.69
Blackburn Corporation	1.04
Blackpool Corporation	1.48
Bolton Corporation	0.74
Burnley Corporation	1.11
Bury Corporation	0.74
Manchester Corporation	0.76
Oldham Corporation	0.59
Preston Corporation	0.85
Rochdale Corporation	0.70
St. Helens Corporation	0.69
Salford Corporation	0.72
Stockport Corporation	0.73
Warrington Corporation	0.93
Wigan Corporation	0.93
<hr/>	
The Survey Region as a Whole	0.73

* Includes Heating and/or Cooking Supplies.

APPENDIX 9B.

*Notes on Private Generation of Electricity in the areas of four Authorised Undertakers in the Survey Region.**

1. *Manchester Corporation.*—In the area of the Manchester undertaking, the extent of private generation of electricity is very small in comparison with the aggregate public generation. The competition of steam is much more important than that of privately generated electricity.†

2. *Bury Corporation.*—Owing to the low price of electric power offered by the public undertaking in this area, private generation of electricity is uncommon, the most important instances of private plant occurring in the paper industry.

3. *Burnley Corporation.*—In this area, private generation is confined to a very small number of firms. The two leading examples are a colliery undertaking and a cotton weaving establishment. The former produces electricity for one of its collieries in the district, and in one year actually sold a quantity of electrical energy to the public undertaking: but at another of its collieries, it purchases power from the public supply for pumping, winding, etc. The cotton weaving firm uses its electricity for power and lighting purposes, and enjoys the further advantage that the steam used in the generation of electricity can be employed at a lower pressure for heating and important process work—the kind of advantage which accrues in many other industries to firms which generate their own electricity.

4. *Nelson Corporation.*—No more than two firms of any size—and those cotton weaving firms—have their own generators. One of these finds, however, that it is profitable to take power from the public supply for a section of its work which is engaged upon a special process requiring a very steady and regular drive.

* See p. 249.

† See p 366.

APPENDIX 9C.

*Notes on the consumption of public electric power in industry in the Survey Region.**

Several authorised undertakings were able to provide statistics showing the amount of electric power sold to each important industry in their areas over a number of years. Others gave an industrial classification of the electric motors connected to their supply either for one year or a number of years.

1. *Manchester Corporation.*—Table I gives an analysis of the power sales of the Manchester Corporation undertaking in each of the years from 1923–24 to 1930–31, based on an industrial classification of its consumers.

TABLE I.

Consumers' Classification.	Millions of Kilowatt-hours. Years ended March 31st.							
	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.
Engineering	51·1	57·1	59·0	57·1	62·0	64·6	69·6	61·9
Textiles	27·8	32·3	33·9	34·2	39·8	37·2	36·4	30·0
Chemicals	22·2	23·4	24·6	23·3	28·6	31·1	33·9	31·4
Sundry Industrial ...	31·0	33·5	40·8	43·7	47·5	51·6	55·2	60·2
Total industrial power	132·1	146·3	158·3	158·3	177·9	184·5	195·1	183·5
Total sales to consumers.	222·2	257·3	300·4	323·5	353·5	375·2	392·9	377·7

Sales to the engineering industry rose from 51·1 million units in 1923–24 to 69·6 millions in 1929–30, and then fell to 61·9 millions in 1930–31. The chemical industry took about 50 per cent. more in 1929–30 than in 1923–24, but then suffered a decline in 1930–31. The demands of the textile trades increased by 40 per cent. between 1923–24 and 1927–28, but slumped very badly in 1928–29 and 1929–30 and again in 1930–31 when they reached a level only 8 per cent. higher than the 1923–24 level. It will be seen that the rapid and unchequered growth of the "Sundry Industrial" total—from 31 million units in 1923–24 to 60·2 millions in 1930–31—materially contributed to the increase in the total power sales in this period, and was not interrupted even in 1930–31. It has been ascertained that the decline in power sales in 1930–31 shows itself in the sales to large users (i.e., those users who take high-tension power supplies by special contract containing a fuel clause), whereas a considerable increase in the number of ordinary small users has produced a slight net increase in the aggregate sales to this class.†

It will be noted that sales to three industries,—engineering, textiles, and chemical—accounted for 67 per cent. of the total power sales of this undertaking in the year 1930–31.

2. *Lancashire Electric Power Company.*—A rather more detailed classification of units sold to industry has been made by the Lancashire Electric Power Company. Table II sets out the total units sold by this undertaking to each of nine groups of industrial consumers in each of the years from 1921 to 1930.

* See p. 250.

† Industrial power sales of the Manchester Corporation undertaking in 1929–30 and 1930–31:—Large users (fuel clause) took 157·5 million units in 1929–30 and 145·3 in 1930–31. Small users took 38·9 million units in 1929–30 and 40·0 in 1930–31. The capacity of electric motors connected to the Corporation's supply has fallen from 193,690 kw. in 1929–30 to 188,226 kw. in 1930–31. See below, p. 365, for a further reference to the position of this undertaking in 1930–31.

TABLE II.

THE LANCASHIRE ELECTRIC POWER COMPANY.

*Classification of Units Sold, 1921-1930.**(In millions of Units.)*

Class. Year ended 31st December.	1921.	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.
Spinners, Weavers, etc.	13·6	21·9	22·8	26·8	30·3	29·1	33·3	34·6	32·1	26·3
Artificial Silk Manufacturers	—	—	—	0·4	1·3	1·6	3·3	5·9	7·0	8·5
Bleachers, Dyers, etc.	3·3	5·0	5·7	7·1	8·0	7·9	8·6	8·5	8·2	7·5
Collieries	10·8	12·7	13·5	15·8	14·2	11·2	15·1	14·6	14·2	15·4
Engineers	2·1	2·7	2·1	2·7	5·9	6·4	8·5	9·1	9·0	8·1
Paper Manufacturers	4·5	6·0	6·9	7·6	7·1	7·0	5·6	7·0	8·2	7·6
Chemical Manufacturers	0·1	0·1	0·1	0·2	0·6	2·2	3·3	4·8	6·0	5·8
Electro-Chemical Works	2·4	2·7	3·3	4·3	5·6	5·6	6·3	6·9	7·8	6·7
Rubber Manufacturers	—	—	—	—	—	5·2	8·9	10·7	13·3	13·2
Miscellaneous	1·7	1·1	1·8	1·9	2·1	2·1	1·9	1·8	2·1	2·4
Sales to Industries	38·5	52·2	56·2	66·8	75·1	78·3	94·8	103·9	107·9	101·5
Totals (including Bulk Supplies and Provisional Orders).	50·0	76·2	88·7	110·7	130·6	146·5	175·4	206·6	226·6	220·6

The increase in the sales of this Company between 1921 and 1930 was due in roughly equal parts to the growth of sales to the nine industrial groups mentioned and the increase in bulk supplies given to other authorised undertakings. Sales to industries increased by almost 200 per cent. in the period 1921-1929, the steady progress being maintained even in the year 1926. But 1930 saw a slight decline from the level reached in the previous year.

It will be observed that the classification of industrial consumers into nine groups is almost exhaustive. The "miscellaneous" group does not include any large consumer. Each group has contributed substantially to the aggregate growth of consumption in the ten years, but the largest absolute increases have been registered by textile spinning and weaving, rubber, artificial silk and engineering. Artificial silk and rubber, in spite of their late start, have quickly become prominent, while the growth of sales to chemical manufacturers has gathered speed since 1925. In 1930, textile spinning and weaving, coal and rubber accounted for 26 per cent., 15 per cent. and 13 per cent. respectively, of the total units sold to industries.

The magnitude of the demand of spinning and weaving is surprising in view of the fact that the Company's area of supply does not include any of the big cotton centres but is confined to a number of smaller towns and villages lying on the fringe of the cotton areas. Increased sales to collieries have been achieved in face of the competition of much private electric generating plant installed at or near the pithead. A notable feature of this Company's system is that the firms supplied in several of the industries are widely scattered over a large area of supply and are connected with one or other of three power stations situated at Kearsley, Padiham and Radcliffe.

3. *Stretford and District Electricity Board.*—The analysis of units sold for power purposes in Table III has been supplied by the Stretford and District Electricity Board. The figures for the years 1924 to 1929 relate to the Stretford Urban District Council Undertaking, those for the years 1930 and 1931 to the undertaking of the Board itself.*

The Board's area of supply includes the greater part, if not the whole, of the Trafford Park industrial area,† and the rapid increases in its sales to industry may be ascribed partly to the laying down of new plants in that area since the War and partly to the growth in capacity of existing establishments. The range of industries and trades in Trafford Park is unusually wide, and most of them are relatively "new" industries which prefer electric power to any other form of power.

The total power load of the Undertaking has increased from 16.9 million units in 1920-21 to 62.8 million units in 1930-31, and the exceedingly rapid progress has only been interrupted in two years 1921-22 and 1926-27. Only a small part of the large increase in the total in 1929-30 was due to the accession of the Barton and Urmston Electricity Board's load to that of the Stretford U.D.C. Undertaking.‡

* The Board acquired the Undertakings of the Barton and Urmston Electricity Board and the Stretford Urban District Council as from 31st March, 1929.

† The Board's area of supply is the Urban Districts of Stretford and Urmston, and the parishes of Davyhulme, Barton Moss and Flixton in the Rural District of Barton-upon-Irwell.

‡ Between 19th May, 1928, and 31st March, 1929, the Barton and Urmston Electricity Board sold only 0.02 million units for power purposes.

TABLE III.

STRETFORD AND DISTRICT ELECTRICITY BOARD.

Analysis of Units sold for Power Purposes in each year from 1923-24 to 1930-31.

Trade.	Year ending March 31st.							
	1923-4.	1924-5.	1925-6.	1926-7.	1927-8.	1928-9.	1929-30.	1930-1.
Food Products	222,197	338,010	306,952	434,261	510,762	558,281	670,745	874,633
Rubber	419,279	569,930	1,002,266	806,618	908,424	969,251	615,530	436,727
Flour Milling	4,378,051	4,404,184	3,905,552	3,484,704	3,763,879	4,175,013	4,211,793	4,424,446
Steel	370,770	6,257,544	5,069,700	3,310,400	6,012,550	4,608,450	5,287,400	5,832,170
Asbestos	938,430	1,177,920	1,388,520	1,804,425	1,794,415	2,072,900	1,901,800	2,416,800
Bottles	873,200	2,311,158	1,413,529	8,011	2,416	—	—	—
Cable	1,988,332	2,429,648	2,738,716	2,690,140	2,805,880	3,132,824	3,352,007	2,881,952
Wire	2,422,676	2,010,301	1,869,343	2,885,874	1,741,416	2,272,488	2,770,770	2,734,791
Warehouses	883,359	891,964	1,175,272	1,409,014	1,341,992	1,291,119	1,317,815	1,447,806
Chemicals	1,365,487	1,283,197	1,799,277	3,248,629	3,450,534	2,461,236	4,059,933	3,239,474
Oil	87,980	101,211	226,434	191,202	241,631	322,221	2,245,168	3,952,380
Constructional Engineering	1,341,256	1,378,252	1,095,970	1,362,168	1,768,768	1,764,879	1,682,362	1,358,629
General Engineering	991,217	1,089,112	1,100,394	636,595	943,670	1,036,664	1,094,660	898,700
Electrical Engineering	6,446,936	9,155,553	15,607,552	15,413,523	19,356,166	19,358,855	21,623,958	21,208,692
Motor Engineering	4,080,764	3,412,922	3,739,103	2,970,654	1,733,574	2,593,320	5,307,220	7,271,104
Timber	81,864	86,505	101,279	102,869	106,554	101,433	101,419	94,746
Miscellaneous	5,044,996	394,335	2,019,467	2,213,944	2,258,584	3,890,846	4,160,062	3,898,855
Total	31,936,794	37,291,746	44,559,326	42,973,031	48,741,215	50,609,780	60,402,642	62,971,905

The trend of development of the aggregate load is the resultant of widely different trends in the several industries which contribute to it. Between 1923-24 and 1929-30, consumption increased considerably in electrical, constructional and motor engineering, oil (since 1929), steel, asbestos, cables, and chemicals. On the other hand, sales to bottle making totally disappeared in 1923-29, and consumption showed little change between 1923-24 and 1929-30 in flour milling, general engineering and wire making. In the intervening years, there were substantial fluctuations in the demands expressed by several trades, such as rubber, steel and motor and general engineering.

The continued growth of the total load in the year ending 31st March, 1931, is a very satisfactory feature. The trades with a larger consumption in that year than in the preceding year include oil, motor engineering, asbestos, steel, flour milling and food products.

Sales to electrical engineering, which account for over one-third of the total sales in 1930-31, have risen from 6.4 million units in 1923-24 to a peak of 21.6 million units in 1929-30, the greatest progress occurring in 1924-25 and 1925-26. Next in importance to electrical engineering in 1930-31, come motor engineering, steel and flour milling. Sales to the steel industry were very small before 1924-25 but in that year they rose to a level (6.3 million units) which has not been reached again in any later year. Motor engineering has trebled its consumption in the last three years, following a decline between 1923-24 and 1927-28.

4. *Bolton Corporation.*—The Bolton Corporation Undertaking was able to go as far back as the year 1918-19 in the classification of its sales of electric power. Table IV distinguishes between industrial and non-industrial power, and between engineers, cotton spinners and weavers, textile bleachers, and collieries among industrial power users. Under the heading "non-industrial power" are included supplies to such consumers as cinemas, hotels, churches and shops.

The table shows that in the Bolton area since 1920 the cotton industry has outpaced other trades in the extension of the use of electric power. Sales to spinning and weaving firms continued to increase until 1927-28, after which a decline set in. It will be seen that the percentage growth in consumption of electric power by the cotton industry in this area between 1924 and 1930 was almost as great as the percentage increase in the capacity of electric motors (driven by purchased electricity) installed in the industry as a whole in the same period as revealed by the Censuses of Production of 1924 and 1930.* The decline in consumption after 1927-28 reflects the extension of trade depression to the fine spinning section, a great part of which is found in the Bolton district.

The quantities of electric power sold to engineers, textile bleachers and collieries are small; together they amounted only to 5.39 million units (or 14 per cent. of the total industrial power sales) in 1930-31. The depression in general engineering has brought about a slow decline in the consumption of electricity, sales to engineers being lower in 1929-30 and 1930-31 than in any previous year since 1918-19.†

* See p. 370.

† Sales to Textile Machinists are, of course, included in total sales to Engineers in Table IV, but it has been possible to extract them for the years 1921-22 to 1930-31:—

		(In million units.)			
1921-22	2.01	1924-25	1.21	1927-28	1.67
1922-23	1.41	1925-26	1.43	1928-29	1.75
1923-24	0.85	1926-27	1.40	1929-30	1.60
				1930-31	1.18

It will be seen that, except in 1930-31, the tendency to decline is less marked in these figures than in those of total sales to Engineers.

TABLE IV.
 BOLTON CORPORATION.
Analysis of Units sold in the years from 1918-19 to 1930-31.

Classification of Consumers.	Millions of Units Sold. Years ending 31st March.												
	1919.	1920.	1921.	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.
Engineers	7.3	4.2	5.4	5.0	3.9	4.0	4.03	4.01	4.12	3.97	3.98	3.78	3.25
Cotton Spinners and Weavers	6.9	9.0	9.6	11.0	17.1	20.1	23.96	24.2	29.58	34.41	33.35	31.66	25.36
Bleachers	0.9	1.3	1.3	1.5	1.8	2.2	2.0	1.95	2.05	2.19	2.53	2.44	1.83
Collieries	0.4	0.3	0.3	0.3	0.4	0.4	0.43	0.42	0.53	0.62	0.37	0.21	0.31
Miscellaneous Industrial Power	1.8	2.7	3.3	4.6	4.9	5.4	5.8	6.06	6.23	6.68	8.01	9.2	8.44
Total Industrial Power ...	17.3	17.5	19.9	22.4	28.1	32.1	36.22	36.63	42.56	47.87	48.24	47.29	39.19
Non-Industrial Power ...	0.24	0.26	0.3	0.4	0.3	0.3	0.35	0.42	0.69	0.83	1.02	1.39	1.64
Total Power Sales	17.54	17.76	20.2	22.8	28.4	32.4	36.6	37.1	43.3	48.7	49.3	48.7	40.83
Total Sales to Consumers ...	23.72	24.04	28.7	31.9	38.3	42.6	47.9	50.1	57.2	64.5	66.1	66.0	59.44

The "miscellaneous industrial power" item has made a useful contribution to the growth of total sales since the War. The increase from 1.8 to 8.44 million units is mainly due to supplies to railways for operating sidings and pumping plant, to sewage works and to public works contractors, rather than to the growth of "new" industries.

The total sales to consumers of this undertaking grew in satisfactory fashion until 1928-29, but in the last two years have fallen. The decline in sales to cotton concerns appears to have been mainly responsible, since it more than offsets a slight increase in sales to domestic consumers.

5. *Salford Corporation.*—Figures supplied by the Salford Corporation undertaking show that the power connections of this undertaking are spread over a large number of important trades and services, some carried on in very large units, others consisting of a multitude of relatively small users. Table V gives the capacity in horse power of electric motors connected and the number of consumers supplied in a large number of trades in the Salford Area in the years 1924 and 1931.

TABLE V.

Industries and Services.	At March 31st, 1924.		At March 31st, 1931.	
	No. of consumers.	Horse power of motors connected.	No. of consumers.	Horse power of motors connected.
Engineering Trades ...	178	6,490	187	7,453
Docks	1	6,152	1	7,203
Woodworking ...	69	5,097	110	5,349
Cotton Bleaching, Dyeing and Finishing.	24	4,025	26	6,476
Copper Works ...	1	3,062	1	3,420
Cotton Spinning, Weaving, etc.	19	2,242	17	2,373
Rubber Works ...	4	1,338	4	1,927
Sewage Disposal ...	1	1,266	3	1,306
Waterproof Cloth Manufacturing.	3	1,119	11	1,487
Wire Drawing ...	2	1,108	1	1,106
Paper Mills ...	2	886	1	1,466
Flour, Barley and Pro- vender Mills.	11	697	11	1,715
Brewing and Bottling ...	5	648	6	774
Printing ...	38	643	50	817
Chemical Works ...	19	619	18	564
Collieries ...	1	490	1	540
Garment Making...	82	330	100	423
Glass Making ...	4	212	3	442
Miscellaneous ...	482	3,903	857	7,293
Total ...	946	40,327	1,408	52,134

Total power sales in million units. 1923-24 = 22.51. 1929-30 = 38.89.*

* Figures for year ended 31st March, 1930.

Salford undoubtedly possesses an unusually varied assortment of trades, and it is made clear by the above table that the versatility and adaptability of electric power facilitate its application to the widely divergent requirements of the several industries and of establishments of varying structure and size. It appears that the six industries and services which head the table account for two-thirds of the total capacity of motors connected, and the H.P. of motors in these trades increased by 19 per cent. between 1924 and 1931. The percentage increase in the total power sales greatly exceeded that of total capacity of motors connected, which indicates a considerable growth in the consumption of electricity per H.P. of motors.* Since 1924, the number of power consumers has increased by more than one-half, mainly because of the growth in the "miscellaneous" total. In 1931, electric motors installed in 13 industries and services not mentioned in the table—including laundries and cleaning works, mortar mills and stone crushing, dye and colour making, soap and perfumery works, chocolate and sweet making, lead works, bread and biscuit making, milk dairies, wallpaper works and paint and varnish making—had reached a capacity of over 200 H.P.

6. *Mersey Power Company Limited.*—In the next table, particulars are given of the sales of electric power by the Mersey Power Company Limited in a number of years to the leading industries in its area of supply, and of the horse power of motors connected in each of these industries.

TABLE VI.
MERSEY POWER COMPANY LIMITED.
A.—Sales in Million Units.

Classification.	1926.	1927.	1928.	1929.	1930.
Building Trades ...	20·7	24·3	25·3	26·9	28·7
Engineering ...	10·2	12·5	16·0	16·9	12·9
Chemical Trades ...	3·4	4·6	5·9	8·5	10·2
Copper Refinery ...	3·4	3·7	3·9	3·7	3·1
Tanning Industry ...	1·8	2·0	2·4	2·3	2·4
Oil Refinery ...	0·1	0·3	0·5	0·8	0·9
Railways and Navigation	0·2	0·1	0·3	0·4	0·5
Public Utility ...	0·5	0·3	0·4	0·4	0·5
Miscellaneous ...	0·5	0·4	0·4	0·5	0·7
Total power sales	40·8	48·2	55·1	60·4	59·9
Bulk Supplies to other Undertakings.	8·2	15·1	14·0	15·8	8·2
Total sales for all purposes.	50·8	65·6	71·3	78·8	*

* Figures not yet available.

* It is dangerous to make superficial generalizations from figures of the H.P. of motors installed or connected. Numerous factors—such as intermittent running through chain processes, stoppages for want of orders, the maintenance of reserve or stand-by motors—preclude their being relied upon as an index of business activity or industrial development over a number of years. See Final Report of 1924 Census of Production, the Textile Trades, p. 18, for a discussion of these factors.

B.—Approximate Horse Power Connected.

Classification.	1926.	1927.	1928.	1929.	1930.
Building Trades ...	14,000	15,000	16,000	16,000	16,500
Engineering ...	7,000	8,000	8,500	8,500	9,000
Chemical Trades ...	2,450	3,000	4,000	5,000	6,000
Copper Refinery ...	2,450	2,450	2,600	2,600	2,600
Tanning Industry ...	1,400	1,800	2,000	2,000	2,000
Oil Refinery ...	270	400	600	900	1,100
Railways and Navigation	150	150	350	350	400
Public Utility ...	350	350	350	500	500
Miscellaneous ...	350	500	700	800	1,200
Total power connections.	28,420	31,650	35,100	36,650	39,300

This undertaking operates in the Runcorn district, in which chemicals, engineering and building are the leading industries. The development of its industrial power sales has been remarkably rapid since its public supply was commenced in 1912. They increased from 1.4 million units in 1912 to 7.9 in 1914, 23.6 in 1920 and 30.5 in 1923. The power load was hit badly by trade stagnation in 1921, but showed much greater resilience in 1926 and 1930. In fact, the slight fall in total power sales between 1929 and 1930 was more than accounted for by the drop in engineering alone. Apart from this one lapse in the case of engineering, the three principal industries have steadily increased their use of electric power since the War. The chemical trades, in particular, have been abandoning old processes and adopting electro-chemical processes, as, for instance, in the manufacture of caustic soda and chlorine. It is clear from the second part of the table that the increase in sales is the result of the advance of electrification of existing plant and not of the increased consumption of electricity per H.P. of motors connected. In 1930, indeed, a slight fall in total consumption in all industries went along with an appreciable growth in H.P. of motors connected.

A number of local authority undertakings which were unable to classify their power sales, freely gave us information of a more limited nature on the trend of power consumption in their areas since the War. A summary of this material is given below:—

7. *Oldham Corporation.*—In the table below, particulars are given of units sold by this Supply Authority to cotton spinners and textile machinists, in its area in each year since 1924, and total power sales for the same years.

TABLE VII.
OLDHAM CORPORATION.
Sales of Electric Power (Million units).

Year ending 25th March.	Textile		Total power Sales.*
	Cotton Spinners.	Machinists.	
1925 ...	21.95	3.67	30.89
1926 ...	22.62	5.24	33.99
1927 ...	21.20	6.50	34.10
1928 ...	21.69	6.05	34.74
1929 ...	21.48	6.53	35.39
1930 ...	21.94	8.34	38.50
1931 ...	16.14	6.10	31.11

* Including some units sold for heating purposes.

These figures show how dependent this undertaking is upon the two principal industries in its area. Even in the bad year 1930-31, sales to these two trades accounted for over 70 per cent. of the total power sales. The undertaking has done well to maintain its sales to cotton spinners at their 1924-25 level up to 1929-30, and, in addition, succeeded in more than doubling its sales to textile machinists between 1924-25 and 1929-30.

New connections to cotton spinning firms have been rare in recent years, and in the case of many firms connected, demand for power has been very much curtailed and intermittent. The moderate expansion of total power sales has been assisted by the increasing requirements of the smaller and less highly developed industries, and it is to these mainly that the undertaking must look for the further development of its power load, unless a radical improvement takes place in the condition of the staple trades of the district.

8. *Bury Corporation.*—The steady development in this area since the War has been due much more to increased consumption of electric power by old consumers or the electrification of plant of new firms *ab initio* than to the conversion of large power users from steam to electricity. This generalization is true of the leading industries—cotton, engineering and paper.

In cotton spinning and weaving, a few large and numerous very small plants are electrically driven, some by group drive, others by individual drive. It is estimated that less than one-half of the plant in these trades in the district uses electric power. Other consumers are spread over a big variety of trades, including paper making, printing, textile machinery, slippers and hat manufacture.

9. *Burnley Corporation.*—There has been no tendency here to convert from steam to electric driving in the weaving section of the cotton industry, the principal obstacles being lack of capital and uncertainty that motors installed could be worked to full capacity. At the present time, no textile firm is connected to the public supply, two firms which have converted from steam to electricity since the War having closed down. Engineering and coalmining—the other principal trades in the district—take very little electricity from the Corporation. Perhaps the largest consumers are a firm of cabinet makers and joiners who have gone over from steam since the War, and a number of printing and iron works.

10. *Nelson Corporation.*—Like most of the cotton weaving districts, Nelson has made poor progress in the electrification of plant in its staple industry. Only five weaving firms are at present buying electric power from the public supply,* and steam driving remains almost unchallenged. The largest consumer supplied by the Nelson undertaking is a brick works.

APPENDIX 9D.

Notes on the degree of electrification of mechanical equipment in the industries of the Survey Region.†

1. Table I sets out the results of a special investigation conducted recently in eight industries in the area of supply of the Manchester Corporation undertaking with a view to estimate the extent to which electric driving has been applied. A comparison is made between the capacity in horse power of electric motors connected to the public supply and the capacity in horse power of each of three types of non-electrical plant (*viz.*, steam, gas and oil) installed for direct mechanical driving.

* These cotton firms together consume less than one million units of electricity per annum, and have all commenced to buy power from the Nelson undertaking since 1920.

† See p. 252.

TABLE I.

*Area of Manchester Corporation Electricity Undertaking.
Horse-power of Plant Installed for Electrical and Mechanical Driving.*

Industries.	Public Electricity Supply.	Steam.	Gas.	Oil.	Total.
Engineering	87,522 (97·8%)	720 (0·8%)	694 (0·8%)	520 (0·6%)	89,456 (100·0%)
Cotton (Spinning and Weaving only).	24,800 (43%)	33,550 (57%)	—	—	58,350 (100·0%)
Saw Mills, Timber Yards, Packing Case Works.	3,192 (74·8%)	760 (17·8%)	252 (5·9%)	64 (1·5%)	4,268 (100·0%)
Woodworking and Cabinet Making.	1,820 (79%)	170 (7·4%)	292 (12·7%)	20 (0·9%)	2,302 (100·0%)
Rubber	20,603 (89·0%)	2,450 (10·6%)	100 (0·4%)	—	23,153 (100·0%)
General Printing (excluding Newspapers)	2,219 (89·3%)	75 (3·0%)	190 (7·6%)	—	2,484 (100·0%)
Newspaper Printing ...	11,960 (100%)	—	—	—	11,960 (100·0%)
Brick Making	577 (24·6%)	1,712 (72·9%)	45 (1·9%)	15 (0·6%)	2,349 (100·0%)
Total H.P. in eight industries.	152,693 (78·6%)	39,437 (20·3%)	1,573 (0·8%)	619 (0·3%)	194,322 (100·0%)

It appears from the foregoing table that, in the industries mentioned, steam is the only important competitor of electricity to be reckoned with, and that the competition of steam is serious only in the cotton industry and brick-making, and to a minor degree in rubber works and saw-mills, etc. In this area, as in other parts of the Survey Region, the prevailing opinion is that cotton spinning and weaving firms cannot or will not adopt electric driving (except, perhaps, as existing non-electrical plant wears out, or in equipping a new mill) on account of shortage of capital and lack of confidence in the future of the industry, and that if the further electrification of the cotton industry is economically desirable, it should be viewed as a problem to be faced by the industry as a whole or by homogeneous sections of it rather than by each unit of small resources standing in isolation. The position of engineering in Manchester is quite different from that of cotton. Electric driving is practically universal in the industry, so that henceforth the development of its demand for electricity is bound up more directly with the expansion of its business and of its productive capacity. It has been pointed out already* that there has been a substantial increase in the number of small power users in recent years in

* See above p. 356.

this area, and the above table suggests that it is to these users in the smaller and less highly developed industries rather than to the staple trades that the undertaking must look for the future expansion of its power load.

2. The *Cotton Industry* is a welcome exception to the rule that no estimate can at present be made of the degree of electrification which has been attained in the industries of the Survey Region. For this, we are indebted to the results of the Censuses of Production of 1924 and 1930,* relating to the Textile Trades. The cotton industry is so predominantly located in Lancashire and portions of the adjacent counties that Census figures relating to England, Wales and Northern Ireland or to the United Kingdom can confidently be used as being a fair reflex of conditions in the Survey Region.†

Table II gives the capacity in horse power of the prime movers classified by kinds which were installed in works in the cotton trade in the United Kingdom in each of the years 1907, 1912,‡ 1924 and 1930. Some of this primary motive power would be used to actuate generators for the production of electrical energy (which might be used for driving electric motors, for heating or lighting or in process work, or sold to outside establishments), but the greater part would be applied mechanically.

TABLE II.
Primary Power in the Cotton Trade in the United Kingdom in 1907, 1912, 1924 and 1930.

Kinds of Prime Mover.	Capacity in Horse Power of Prime Movers.			
	1907.	1912.	1924.	1930.*
Reciprocating Steam Engines.	1,210,374	1,357,148	1,332,778	1,098,236
Steam Turbines	8,593	25,380	71,196	100,597
Gas Engines	8,890	9,523	7,132	17,668
Oil Engines		181	449	
Water Power	11,355	10,769	8,068	
Total	1,239,212	1,403,001	1,419,623	1,216,501

* Figures relate to Great Britain.

* The figures for 1930 are provisional only and are taken from Preliminary Reports, No. 2, of the Fourth Census of Production (1930), "Board of Trade Journal," 24th December, 1931. They relate only to firms employing more than 10 persons on the average; but firms in the Cotton Trade employing not more than 10 persons on the average in 1924 were negligible. A number of returns for 1930 is outstanding in both the Spinning and Weaving sections, and consequently the provisional figures, particularly those for the Weaving section, slightly understate the actual power equipment of the Trade.

† See p. 97, note †, as to the proportion of the cotton industry of Great Britain and Northern Ireland which falls within the Survey Region.

‡ The Census of 1912 excluded all firms employing not more than five persons (not being proprietors). This, however, does not materially affect the comparability of the results for the Cotton Trade in 1912 with those for other Census years.

In the year 1924, 98,096 H.P., or 6.9 per cent. of the total H.P. of prime movers installed in the trade, were not in use or only occasionally in use.* In 1930, the corresponding figures were 60,205 H.P. and 5.2 per cent. It will be observed that though the capacity of steam turbines (which are used mainly for actuating electric generators) increased rapidly between 1907 and 1924, and that of reciprocating steam engines fell slightly between 1912 and 1924, and considerably between 1924 and 1930, yet steam engines still represented the great bulk of prime movers in 1930. In the aggregate, the capacity of prime movers of all kinds increased by 1.2 per cent. between 1912 and 1924, notwithstanding the decline in the employment capacity of the industry; whereas, since 1924, the capacity of prime movers has fallen by 14 per cent.

The results of the Censuses of 1924 and 1930 enable a comparison to be made between the primary motive power equipment of the Cotton Spinning and Doubling Trade and that of the Cotton Weaving Trade in each year.† Table III brings together a classification of the prime movers installed in the two sections of the Cotton Trade in Great Britain in 1924 and 1930.

TABLE III.

*Capacity of Prime Movers, classified by kinds, installed in the two sections of the Cotton Trade in Great Britain in 1924 and 1930.**

Kinds of Prime Movers.	Capacity in Horse Power.			
	Cotton Spinning and Doubling.		Cotton Weaving.	
	1924.	1930.	1924.	1930.
Reciprocating Steam Engines.	1,022,207	834,969	310,071	263,267
Steam Turbines	60,516	87,336	10,680	13,261
Others	7,618	10,960	7,604	6,708
Total	1,090,341	933,265	328,355	283,236†

* The figures for both years relate to firms employing more than 10 persons on the average.

† The percentage of the total H.P. installed which was recorded as in reserve or idle was as follows:—

Cotton Spinning and Doubling: 1924 = 5.7 per cent.; 1930 = 4.9 per cent.

Cotton Weaving: 1924 = 10.8 per cent.; 1930 = 5.0 per cent.

* Prime movers, electric generators or electric motors not in use will include equipment which is kept in reserve against breakdowns or a rush of orders and plant which has gone or is gradually going out of commission but has not yet been dismantled, as well as plant which is idle during the year through lack of orders. See Final Report on the Census of Production, 1924, Textiles Trades, p. 18.

† In both Censuses, the spinning and weaving departments of firms which were engaged in both operations were treated as one unit in regard to power equipment, and in such cases, particulars relating to the business as a whole were accepted on the schedule which covered the most important section of the business.

A number of establishments in the Cotton Trade, principally in the Weaving section, rent the whole of their power along with their factories. In 1907, such firms in the United Kingdom employed 40,400 persons, or 7.1 per cent. of the total persons employed in the Trade. The number employed had risen to 47,800 (or 7.7 per cent.) in 1912, but receded to 35,760 (or 6.8 per cent.) in 1924. In 1924, it represented 13.0 per cent. of the total number employed in the Weaving section. Unfortunately we do not know the total capacity of power equipment utilised by these establishments in any year.

The overwhelming preponderance of the steam engine among prime movers is again worthy of note. In Spinning there has been a substantial increase in the capacity of steam turbines since 1924, whereas the total capacity of prime movers in both sections has fallen by about 14 per cent.

Table IV shows the total capacity in kilowatts of electric generators installed in works in the Cotton Trade in the United Kingdom in each of the years 1907, 1912, 1924 and 1930, the generators being classified according to the kind of prime mover by which they were actuated; and Table V gives parallel information for the Cotton Spinning Trade and the Cotton Weaving Trade in 1924 and 1930. It should be noted that the electricity generated by these generators may have been used for driving electric motors or for other purposes such as heating and lighting.

The outstanding features of these tables are the relatively great increase in the capacity of steam turbines used to actuate electric generators in each of the intercensal periods, especially between 1924 and 1930, and the big absolute increase in the total capacity of electric generators in the Cotton Trade (being an increase of 200 per cent. between 1907 and 1924, and one of 43 per cent. between 1924 and 1930). There has also been an appreciable absolute increase in the total capacity of steam engines used to actuate electric generators in both sections of the trade since 1924. It should be noted that in 1930, as much as 80 per cent. of the total capacity

TABLE IV.

Capacity of Electric Generators in the Cotton Trade in the United Kingdom, 1907, 1912, 1924 and 1930.

Electric Generators driven by:—	Capacity in Kilowatts.			
	1907.	1912.	1924.	1930.*
Reciprocating Steam Engines ...	28,906	41,819	55,173	65,637
Steam Turbines	2,681	21,313	39,830	71,789
Gas Engines... ..	} 487	} 1,337	883	} 4,047
Oil Engines			100	
Water Power			2,957	
Total	32,074	64,469	98,943†	141,473‡

* Figures for 1930 relate to Great Britain.

† Of this total, 9,530 kw. (or 9.6 per cent. of the total) were recorded as being ordinarily in reserve or idle during 1924.

‡ Of this total, 18,867 kw. (or 13.3 per cent. of the total) were recorded as being ordinarily in reserve or idle during 1930.

TABLE V.

*Capacity of Electric Generators in the two sections of the Cotton Trade in Great Britain in 1924 and 1930.**

Electric Generators driven by:—	Capacity in Kilowatts.			
	Cotton Spinning and Doubling.		Cotton Weaving.	
	1924.	1930.	1924.	1930.
Reciprocating Steam Engines ...	41,854	47,253	13,319	18,384
Steam Turbines	33,900	63,357	5,930	8,432
Others	3,019	2,578	921	1,469
Total	78,773	113,188	20,170	28,285†

* The figures for both years relate to firms employing more than ten persons on the average.

† The percentage of the total kw. installed which was recorded as in reserve or idle was as follows:—

Cotton Spinning and Doubling: 1924 = 6·9 per cent. ; 1930 = 14·2 per cent.

Cotton Weaving: 1924 = 20·2 per cent. ; 1930 = 8·2 per cent.

of electric generating plant installed in the Cotton Trade was to be found in the Spinning section, the percentage increase since 1924 having been rather greater in the Spinning section than in the Weaving section.

This survey of the power equipment of the Cotton Trade is completed by Tables VI and VII, which classify the capacity of electric motors found at factories in the Census years for which information is available. Table VI relates to factories in the Cotton Trade as a whole in the United Kingdom in 1912, 1924 and 1930, and Table VII to factories in each of the two sections of the Cotton Trade in Great Britain in 1924 and 1930. A distinction is made between motors driven by electricity generated in the works of the firms giving information, and motors driven by purchased electricity.*

TABLE VI.

Analysis of Capacity of Electric Motors installed at factories in the Cotton Trade in the United Kingdom in 1912, 1924 and 1930.

<i>Electric Motors installed.</i>	<i>1912.</i>	<i>1924.</i>	<i>1930.*</i>
	H.P.	H.P.	H.P.
Driven by:—			
(a) Electricity generated in own works.	46,530	92,427	118,323
(b) Purchased Electricity ...	29,903	181,145	252,237
Total	76,433	273,572†	370,560‡

* Figures for 1930 relate to Great Britain.

† Percentage of total capacity recorded as in reserve or idle: 5·6 per cent.

‡ Percentage of total capacity recorded as in reserve or idle: 8·8 per cent.

* The great bulk of purchased electricity will be taken from public supply undertakings, but there may be instances in which the vendor is another private establishment.

TABLE VII.

*Analysis of Capacity of Electric Motors installed at factories in the two sections of the Cotton Trade in Great Britain in 1924 and 1930.**

Electric Motors installed.	Cotton Spinning and Doubling.		Cotton Weaving.	
	1924.	1930.	1924.	1930.
Driven by :—	H.P.	H.P.	H.P.	H.P.
(a) Electricity generated in own works.	77,961	98,179	14,466	20,144
(b) Purchased electricity.	142,920	197,281	37,796	54,956
Total	220,881	295,460	52,262	75,100†

* Figures for both 1924 and 1930 relate only to firms employing more than 10 persons on the average.

† Percentage of total capacity recorded as in reserve or idle:

Cotton Spinning and Doubling: 1924 = 4.9 per cent.; 1930 = 8.1 per cent.

Cotton Weaving: 1924 = 8.2 per cent.; 1930 = 8.9 per cent.

Table VI brings out the important points that the capacity of electric motors installed in the cotton industry has been increasing rapidly since 1912, and that even between 1924 and 1930 there was an increase of 35 per cent. At the same time, it should be noted that since 1912 the use of purchased electricity for driving motors has made much greater headway than the use of factory-produced electricity. Thus, whereas the capacity of motors driven by factory-produced electricity almost doubled between 1912 and 1924 that of motors driven by purchased electricity was more than six times as great in 1924 as in 1912. Since 1924, however, the relative progress of purchased electricity has been less marked. In 1924, 66.2 per cent. of the total capacity of motors represented motors driven by purchased electricity; in 1930, the percentage had risen to 68.1 per cent.

It will be seen from Table VII that in 1930, four-fifths of the capacity of motors in the Cotton Trade in Great Britain were to be found in the Spinning section. The use of electricity, both factory-produced and purchased, has been extended in both sections of the industry since 1924, but the proportion of motors driven by purchased electricity is rather higher in the Weaving section than in the Spinning section.

The foregoing Census results point to the conclusions that while electric driving of machinery in the cotton industry has made considerable progress during the last decade, and the capacity of electric motors installed has greatly increased although the total capacity of primary power equipment in the industry has declined, mechanical driving is still by far the commoner mode of driving. Moreover, it appears that the number of concerns in cotton which use electric power generated in their own works is still increasing, and that competition between private generation of electricity and generation in the stations of authorised supply undertakers since 1924 has been fairly evenly waged, yielding no clear advantage to either source of supply over the other.

On this last point, it is dangerous to dogmatise, because the particulars of the increase in the capacity of motors driven by privately generated electricity and purchased electricity respectively are not necessarily indicative of the actual increase in the amount of electricity supplied from either source. The Censuses of 1924 and 1930, unfortunately, do not yield comparative figures of the quantity of electricity used in Cotton Spinning or Weaving factories in each year: information on this subject was not required compulsorily in 1924 as was the case in 1930. The following table shows the quantity used *for all purposes* in 1930 in each section of the industry.

TABLE VIII.

GREAT BRITAIN, 1930.

*Total quantity of electricity used for all purposes.**

	<i>Cotton Spinning.</i>	<i>Cotton Weaving.</i>
	<i>Million units.</i>	<i>Million units.</i>
Electricity generated at firms' works ...	110.0	21.4
Purchased electricity	281.5	50.9†
Total	<u>391.5</u>	<u>72.3</u>

* No figures are available of the quantity used for power purposes only.

† In 1907, the total quantity of electricity purchased by *all* firms for *all* purposes in the Cotton Trade in the United Kingdom was only 10.4 million units.

In 1930, more than four-fifths of the total were used in the Spinning section; and in the industry as a whole, over 70 per cent. of the electricity used was purchased. In the year ended 31st March, 1930, the sales of electricity for power purposes by authorised supply undertakers in the Survey Region amounted to 904 million units, and sales for all purposes reached 1,276 million units. Assuming that 80 per cent. of the cotton industry of Great Britain is to be found in the Survey Region and that "purchased electricity" consists wholly of electricity purchased from authorised supply undertakers, it would appear that in 1930 rather more than one-fifth of the total sales to consumers by authorised undertakers in the Survey Region was represented by sales to the cotton industry.

Finally, the Census results enable certain estimates to be made of the amount of power available in the Cotton Trade in 1912, 1924 and 1930 for mechanical and electrical application respectively.* The estimates can only be regarded as giving a rough indication of the position in each year, because, as is well known, the total capacity of power equipment installed upon which the estimates are based, is, for several reasons, likely to exceed the actual working capacity of the plant in use at any given moment.† Since the excess affects the figures of power available for mechanical application and for electrical application fairly evenly, the estimates may not unreasonably be used to determine the proportion of the total available power which is applied electrically.

* The method used in making these estimates is that adopted in the Textile Trades volume of the Final Report on the 1924 Census of Production, pp. 20, 56, and in Appendix Q to the Eighth Annual Report of the Electricity Commissioners, 1929, p. 206.

† See the Textile Trades volume of the Final Report on the Census of Production, 1924, pp. 19, 20, and Appendix Q to the Eighth Annual Report of the Electricity Commissioners, 1929, p. 206, for discussion of the validity of estimates of available power arrived at in those Reports.

The following are the quantities and proportions estimated for the years 1912, 1924 and 1930:—

TABLE IX.

Percentage Distribution of Available Power between mechanical and electrical application in the Cotton Industry in 1912, 1924 and 1930.

	Mechanical Application H.P.	Electrical Application H.P.	Total Available Power. H.P.
(A) United Kingdom:—			
Cotton Spinning and Weaving Trades combined—			
1912	1,310,000 (94·5%)	76,000 (5·5%)	1,386,000 (100·0%)
1924	1,278,000 (82·3%)	274,000 (17·7%)	1,552,000 (100·0%)
1930*	1,016,000 (73·3%)	370,000 (26·7%)	1,386,000 (100·0%)
(B) England and Wales and Northern Ireland:—			
Cotton Spinning Trade—			
1924	967,000 (82·7%)	202,000 (17·3%)	1,169,000 (100·0%)
Cotton Weaving Trade—			
1924	295,000 (85·3%)	51,000 (14·7%)	346,000 (100·0%)
(C) Great Britain†:—			
Cotton Spinning Trade—			
1924	978,000 (81·6%)	221,000 (18·4%)	1,199,000 (100·0%)
1930	774,000 (72·4%)	295,000 (27·6%)	1,069,000 (100·0%)
Cotton Weaving Trade—			
1924	298,000 (85·1%)	52,000 (14·9%)	350,000 (100·0%)
1930	242,000 (76·3%)	75,000 (23·7%)	317,000 (100·0%)

* Figures for Great Britain.

† Figures for both 1924 and 1930 relate only to firms employing more than 10 persons on the average.

An independent estimate of the degree of electrification in the Cotton Industry in Great Britain in 1924 sets the figures at 19 per cent., which should be compared with the figures for the Cotton Industries of U.S.A. and Germany in 1925 of 66 per cent. and 49 per cent. respectively.* Since 1924, it appears, the degree of electrification in the British Cotton Industry has risen from under 18 per cent. to about 27 per cent., the rise being due partly to the big decline in the quantity of power available for mechanical application, and partly to the greatly increased capacity of electric motors installed, notwithstanding the substantial contraction of the total primary power equipment of the industry.

* These three estimates were made by the economic and statistical department of the British Electrical and Allied Manufacturers' Association.

APPENDIX 10.

The Southern Drift of Population.

The 1931 Census of Population and the annual estimates of the total of insured persons in each of the several Employment Exchange Divisions since 1922 make it clear that there has been a large increase in total and in working population in the South of England particularly in the area around London and that this increase is, in part, due to migration from other parts of the country.

The factors which govern the size of the insured population are:—

(1) The size of the total population. Everything else remaining the same, an increase of total population may be expected to bring about an increase of "occupiable" persons and an increase of insured persons.

(2) The total population remaining constant, a change in age distribution may bring a larger proportion of the population within the normally occupiable ages and augment the insured population.

(3) Apart from any change in the size, or age distribution of the total population, "occupiable" population, and with it insured population, may increase if large numbers of persons of a class which normally would not contemplate remunerative industrial work now do so, as, for example, if women previously engaged in the home enter an industrial occupation.

(4) The insured population may increase through the transfer of persons from uninsured to insured trades as, for example, by movement from agriculture or domestic service to insured occupations.

(5) Changes in the scope or the administration of an Unemployment Insurance Scheme may produce like results.

It is not possible, upon the basis of existing knowledge, to come to a definite conclusion as to the relative importance of these factors in producing the marked expansion of insured workers in the South. Nevertheless the available information seems to lend support to the view that at least part of this expansion is due either to a movement from uninsured to insured trades or to the drawing into industry of persons of a type not formerly constituting a part of the industrial working population.

It is a striking fact that in every Employment Exchange Division in England and Wales the percentage expansion of the numbers of insured persons, July, 1922—July, 1931, has been greater than the percentage increase of total population, June, 1921—April, 1931. This may be due in part to a change in the age constitution of the population which has, since 1921, increased the proportion of those between 16 and 65 years of age. Or it may be attributable, in some measure, to the operation of the Unemployment Insurance Scheme, for the possibilities of benefit under it have very probably attracted numbers of persons who do not seek continuous industrial employment, and retained in insurance persons who would normally have dropped out of industry altogether. Whilst this tendency for the insured population to expand more rapidly than the total population is common to all areas, in the London and the S.E. Employment Exchange Divisions* the disparity between the two is particularly marked. In Table I below it is shown that total population in this area increased, 1921-31, by 9.2 per cent. but insured population, 1922-31, by 21.4 per cent. A large disparity between these two percentages is found also in the South-Western Division and the Midlands, but a much smaller disparity for the other Divisions.

* These two Divisions are grouped together in order to cover the decentralization of population which has gone on in the Greater London Area.

TABLE I.

Increase of Total Population, 1921-31, and Insured Population, 1922-31, in each of the Employment Exchange Divisions.
(Total Population in 1921 = 100; Insured Population in 1922 = 100.)

Employment Exchange Division.	Total Population 1921-31.			Insured Population 1922-31†		
	Males.	Females.	Total.	Males.	Females.	Total.
London and the South-East.	110·2	108·3	109·2	120·8	122·9	121·4
S. Western ...	106·3	104·5	105·3	117·0	118·1	117·3
Midlands ...	107·6	106·9	107·2	111·9	115·6	113·0
N. Eastern ...	103·8	103·4	103·6	105·1	113·5	106·9
N. Western ...	102·5	102·6	102·6	104·7	113·0	107·4
Wales ...	97·3	97·9	97·6	98·5	115·3	100·0

† No allowance for exclusion of those over 65 years of age after January, 1923. Unfortunately, the numbers of insured persons in each Employment Exchange Division are not available for the year 1921.

It follows that the percentage increase in the number of insured persons per 100 of the total population has been greater for the Southern districts than for the other divisions and Great Britain as a whole. This is shown in Table II.

TABLE II.

Percentage Increase in the Number of Insured Persons per 100 of the Total Population in the Several Employment Exchange Divisions.

Division.	Males.	Females.	Total.
London ...	18·8	23·9	20·8
S.E. ...	10·1	13·8	10·7
S.W. ...	10·0	13·2	11·5
Midlands ...	4·2	8·0	5·5
N.E. ...	1·3	9·4	3·2
N.W. ...	2·2	9·8	4·9
Wales... ..	1·2	17·6	2·6

It does not necessarily follow, because there is this difference between the Southern Divisions and the other parts of the country, that a large number of persons are moving from uninsured to insured occupations or that industry is finding recruits among those who previously did not work for gain. Other explanations are possible:—

(1) There may have been in this London and South-Eastern Area a very rapid increase of the numbers at occupiable ages. There is some evidence that this has taken place. The increase in the total population between 1921 and 1931 was large, over 9 per cent.; but the 1931 Census shows that about half this could be attributed to migration from other parts of the country. On the whole, it would probably be safe to assume that these migrants would consist largely of fairly young and unmarried workers going South because of the demand for labour. The effect would be to increase above its previous level the proportion of the population between the insurable ages.

(2) The dissimilarities between the Southern Divisions and other areas might possibly be due to the disparity between unemployment rates to be found in them. When unemployment is heavy, as it has been in Wales, the North-Eastern and the North-Western Divisions, then numbers of young persons may attain the age of 16 years, but, because they never find employment, never come within the statistics of insured persons. In areas where employment is more easily found, as has been the case in the South East since 1922, this does not operate to the same degree, and the insured population, in relation to total population, tends to grow faster.

So far as we are aware, there is at present no method of determining statistically how far these two factors have operated to produce the marked disparity between the rates of growth of total and that of insured population in the South. There does seem to be, however, a fairly strong suggestion that the ranks of industry in the South have been swollen by movements into insured trades from uninsured occupations or by an inflow into industry of a part of the population which previously did not engage in work outside the home at all and now finds itself attracted by the increased demand for industrial workers.

This conclusion finds strong support in a study of the new entrants into Unemployment Insurance. The statistics, collected by the Ministry of Labour, of persons who enter insurance *for the first time* distinguish between juveniles 16-18 years of age and adults above 18 years. The adult entrants into insurance will be persons who either have not been working at all in this country or have been engaged in uninsured occupations.* The relation, therefore, between the number of "adult" entrants and the number of "juvenile" entrants gives some indication of the extent to which the labour force in the insured trades is being reinforced by older people taking up employment for the first time or moving from the relatively small uninsured occupations to the great bulk of occupations covered by Unemployment Insurance since 1920. When this relation is compared in the different Divisions the proportion of adults is much higher in the growing Southern Areas than elsewhere. This is shown in Table III.

It will be seen that, whilst the proportion of adult to juvenile entrant has been falling in all areas, the proportion has been consistently higher for both males and females in the South-Eastern Division than for Great Britain as a whole. For the London Division the female proportion is well above the average but the male fell below the national average, 1927-31.

It appears likely, therefore, that the labour required for the rapid industrial expansion in the South has been met, partly by an increase in population made more rapid by an inward migration from other parts of the country, partly by the drawing into industrial life, perhaps especially in the case of women, of many who were either in agriculture or domestic service, the two great uninsured occupations, or who were not accustomed to take work outside the home.

* Persons employed other than by way of manual labour are excluded from insurance if their remuneration exceeds £250 p.a. An adult entrant to insurance, therefore, might enter the insured population, without changing his occupation, through a fall in his salary.

† One further possibility, which however is not a probability, is the numbers of uninsured adults have moved from other areas and become insured for the first time in the Southern Divisions.

TABLE III.

*New Entrants into Insurance 1923-24 to 1930-31.**Proportion of "Women" Entrants to "Girl" Entrants and of "Men" Entrants to "Boy" Entrants in Several Employment Exchange Divisions.*

	LONDON.		S. EASTERN.		N. WESTERN.		GREAT BRITAIN.	
	Percentage of :		Percentage of :		Percentage of :		Percentage of :	
	Men to Boy Entrants.	Women to Girl Entrants.	Men to Boy Entrants.	Women to Girl Entrants.	Men to Boy Entrants.	Women to Girl Entrants.	Men to Boy Entrants.	Women to Girl Entrants.
1923-4*	121.0	88.7	102.4	89.9	56.2	61.4	75.5	71.6
1924-5*	98.1	79.1	86.0	79.9	47.9	57.9	63.5	65.4
1925-6	43.7	59.7	78.4	72.7	36.7	39.8	43.5	49.7
1926-7	31.1	47.5	52.4	50.0	26.8	33.3	31.9	40.6
1927-8	31.9	52.5	54.2	63.2	26.9	35.9	30.8	43.6
1928-9	23.1	49.8	49.4	62.7	22.5	29.1	27.2	40.7
1929-30	26.6	54.3	51.8	57.3	22.8	26.9	28.4	39.7
1930-31	24.1	45.4	48.0	52.1	22.1	23.1	29.1	35.2

* Systematic search for duplication of applications commenced January, 1925.

APPENDIX 11.

TABLE I.

Numbers and Percentage of Insured Persons Unemployed in Certain Industries in the Survey Region.

1929, 1930 and 1931.

	Cotton.	Distribution.	General Engineering.	Coal Mining.	Building.	Textile Finishing.	Tailoring.	Printing and Publishing.	Hotel, etc.	Tram and Bus.	Electrical Engineering.	Shirts, Underclothing.	Chemicals.	Rubber.	Bread, Cakes, etc.	All Industries.
1929. (Av. 4 months.)																
Numbers Unemployed ...	63,010	10,025	15,687	18,970	9,644	8,580	2,406	1,117	2,697	623	1,095	569	1,592	2,075	1,042	179,624
Percentage Unemployed ...	13.5	7.0	15.5	22.4	15.5	17.3	9.6	4.8	13.7	3.2	5.5	3.4	8.5	12.8	7.2	12.3
1930.																
1st Quarter Numbers Unemployed	130,468	14,656	24,683	13,069	14,039	13,186	2,634	1,758	4,489	892	1,421	912	2,196	3,044	1,551	286,775
Percentage Unemployed ...	27.7	9.7	24.7	15.4	23.6	26.7	10.8	7.4	22.0	4.5	6.7	5.1	12.3	17.6	10.0	19.3
2nd Quarter Numbers Unemployed	207,341	16,526	27,980	28,282	11,614	14,715	2,830	2,068	4,369	675	1,791	972	3,042	3,190	1,601	386,681
Percentage Unemployed ...	44.1	10.9	28.0	33.2	19.5	29.8	11.3	8.7	21.4	3.4	8.5	5.4	17.1	18.4	10.3	29.0
3rd Quarter Numbers Unemployed	220,293	19,674	32,211	27,689	13,344	18,396	4,558	1,791	4,395	761	2,206	1,966	2,977	3,573	1,690	429,223
Percentage Unemployed ...	46.9	13.0	32.2	32.5	22.4	37.3	18.3	7.5	21.5	3.8	10.5	10.9	16.7	20.6	10.9	28.8
4th Quarter Numbers Unemployed	238,007	20,454	39,974	16,502	19,131	16,368	5,036	2,538	6,349	1,143	3,060	1,963	3,756	4,201	1,889	464,114
Percentage Unemployed ...	60.6	13.5	39.9	19.4	32.1	33.2	20.2	10.6	31.1	5.7	14.5	10.9	21.1	24.3	12.1	31.2
1931.																
1st Quarter Numbers Unemployed	182,902	22,890	40,715	16,444	17,714	20,062	8,739	3,047	6,419	1,187	4,142	1,419	3,506	4,980	2,245	418,168
Percentage Unemployed ...	39.4	14.1	42.3	19.9	30.1	41.2	13.8	12.4	29.2	5.6	20.0	7.7	19.9	28.9	13.4	27.7
2nd Quarter Numbers Unemployed	197,392	22,590	42,046	27,643	14,004	17,819	2,978	2,742	5,610	863	3,649	1,494	3,622	4,451	2,258	436,219
Percentage Unemployed ...	42.6	13.9	43.7	33.5	23.8	36.6	11.0	11.2	25.5	4.1	17.7	7.7	20.5	25.8	13.5	28.8
3rd Quarter Numbers Unemployed	222,427	25,235	42,283	32,033	15,684	20,171	4,961	2,837	5,709	950	3,800	2,530	3,569	4,593	2,373	485,322
Percentage Unemployed ...	48.0	15.5	43.9	38.8	26.7	41.4	18.3	11.6	26.2	4.5	18.4	13.7	20.4	28.7	14.2	34.1

TABLE II.

*Index of Numbers of Insured Persons Unemployed in Certain Industries in the Survey Region.
Quarterly Average for 1929=100.*

	Cotton.	Distribution.	General Engineering.	Coal Mining.	Building.	Textile Finishing.	Tailoring.	Printing and Publishing.	Hotel, etc.	Tram and 'Bus.	Electrical Engineering.	Shirts, Under-clothing.	Chemicals.	Rubber.	Bread and Cakes.	All Industries.
1929 ...	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
<i>1930.</i>																
1st Qtr. ...	207.0	146.2	157.3	68.9	145.6	153.7	111.6	157.4	166.4	143.2	129.8	160.3	137.9	146.7	148.8	159.7
2nd „ ...	329.1	164.8	178.4	149.1	120.4	171.5	117.6	185.1	162.0	108.3	163.6	170.8	191.1	153.7	153.6	215.3
3rd „ ...	349.6	196.2	205.3	146.0	138.4	214.4	189.4	160.3	163.0	122.2	201.5	345.5	187.0	172.2	162.2	239.0
4th „ ...	377.7	204.0	254.8	87.0	198.4	190.8	209.3	227.2	235.4	183.5	279.5	345.0	235.9	202.5	181.3	258.4
<i>1931.</i>																
1st Qtr. ...	290.3	228.3	259.5	86.7	183.7	233.8	155.4	272.8	238.0	190.5	378.3	249.4	220.2	240.0	215.5	232.8
2nd „ ...	313.3	225.3	268.0	145.7	145.2	207.7	123.8	245.5	208.0	138.5	333.2	252.0	227.5	214.5	216.7	242.3
3rd „ ...	353.0	251.7	269.5	168.9	162.6	235.1	206.2	254.0	213.9	152.5	347.0	444.6	226.1	221.3	227.7	270.2

TABLE III.
*Percentage Industrial Distribution of Insured Persons Unemployed in the
 Survey Region. 1929, 30 and 31.*

Industry.	1929.	1930.		1931.	
	3 Monthly Average.	1st Qtr.	3rd Qtr.	1st Qtr.	3rd Qtr.
Cotton	35.1	45.5	51.3	43.7	45.8
Distribution	5.6	5.1	4.6	5.3	5.2
General Engineering	8.7	8.6	7.5	9.7	8.7
Coal Mining	10.6	4.5	6.5	3.9	6.6
Building	5.4	4.9	3.1	4.2	3.2
Textile Finishing	4.8	4.6	4.3	4.8	4.2
Tailoring	1.3	0.9	1.1	0.9	1.0
Printing and Publishing	0.6	0.6	0.4	0.7	0.6
Hotel, etc.	1.5	1.6	1.0	1.5	1.2
Tram and 'Bus	0.3	0.3	0.2	0.3	0.2
Electrical Engineering	0.6	0.5	0.5	1.0	0.8
Shirts, Underclothing	0.3	0.3	0.5	0.3	0.5
Chemicals	0.9	0.8	0.7	0.8	0.7
Rubber	1.1	1.1	0.8	1.2	0.9
Bread and Cakes	0.6	0.5	0.4	0.5	0.5
Other Industries	22.6	20.1	17.1	21.0	19.9
Total	100	100	100	100	100

Gokhale Institute of Politics
 and Economics, Poona 4.