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RECENT ECONOMIC CHANGES



RECENT ECONOMIC CHANGES

IN THE UNITED STATES

REPORT OF THE COMMITTEE ON RECENT ECONOMIC CHANGES,
OF THE
PRESIDENT'S CONFERENCE ON UNEMPLOYMENT

HERBERT HOOVER, CHAIRMAN

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CHAPTER VI

LABOR

BY LEO WOLMAN

The labor situation both reflects underlying economic conditions and helps to account for them. In this field, as in others, adequate explanation of puzzling phenomena is delayed by the lack of comprehensive and continuous statistical series. Many relationships that unquestionably exist among the various forces of the labor market will remain concealed as long as the data that might throw light upon them are incomplete and in a measure unreliable. The organic character of the American labor market is often suggested, if not proved, by placing in juxtaposition the best available measures of the elements of the labor market. Such a procedure is employed in this chapter, where what appear to be the significant items in the labor situation are examined with regard to their postwar and prewar manifestations.

I. POPULATION AND LABOR SUPPLY

Probably the outstanding feature of the population question in the United States since 1920 has been the marked drop in its rate of natural increase. In the period from July 1, 1920 to July 1, 1925, the average annual increase in population was 1,800,000, whereas in the years following, from July 1, 1925 to July 1, 1928, the average annual increase had fallen to 1,545,000. The factors making for a slackening rate of growth, immigration restriction and a birth rate that appears to be falling more rapidly than the death rate, are apparently not temporary ones. They may, in view of the present trends, be expected to exert a similar influence for many years to come.¹

Changes in the rate of growth of the total population do not necessarily reflect like changes in the supply of labor. The rising productivity of industry may from time to time produce an increase in the surplus of labor in the face of a stationary population. Within a given population, moreover, a larger or smaller proportion of the people of a country may seek gainful employment in industry, trade, and service. Again, the inhabitants of an undeveloped area may, through the development of industry, become employed for the first time and thus add to the available supply of labor. In the United States, forces such as these are continuously and simultaneously in operation. From 1870 to 1910, the

¹ W. S. Thompson, "Population," *American Journal of Sociology*, July, 1928, p. 3.

percentage of women in the total number of workers of the country advanced from 14 to 20.6 per cent.² The industrialization of the South has likewise acted to increase the available labor supply. The northward migration of the negro has represented in part a net addition to the total labor supply of the country and in part a redistribution of it.³

All of these items are significant, but since 1920 the striking changes in the American labor market have been associated with the policy of immigration restriction, the growth of industry in the South, and the falling birth and mortality rates of the country.

Immigration.⁴—While the effects of the war on European political and economic conditions may have reduced the postwar emigration of European labor into the United States, the fact remains that war embargoes and restrictive legislation have produced a condition in this country in marked contrast to that existing before the war. The natural restrictions arising out of the war, and the later legislation, combined to change radically both the volume and the character of American immigration.

The first legislation designed to affect the quantity of immigration was the Quota Act, of May 19, 1921. This law limited the number of aliens of any nationality, to be admitted in any fiscal year, to 3 per cent of the number of foreign-born persons of such nationality resident in the United States, as determined by the Census of 1910. The law of 1921 was later made effective to June 30, 1924. A new quota law, known as the "Immigration Act of 1924," became effective July 1, 1924. By its terms, the annual quota of any nationality is reduced to 2 per cent of the number of foreign-born of that nationality in the United States, as determined, not by the census of 1910, but by the census of 1890. The native-born citizen of Canada, Mexico, Newfoundland, Cuba, and the independent countries of South and Central America, is exempt in this as in the earlier law.

TABLE 1.—COMPARISON OF PREWAR IMMIGRATION AND QUOTAS^a

	Northern and Western Europe	Southern and Eastern Europe and Asia
Average annual immigration, July 1, 1907 to June 30, 1914.....	176,983	685,531
Quotas for year ended June 30, 1922.....	198,082	158,367
Quotas for year ended June 30, 1925.....	140,999	21,847

^a Compiled from the annual reports of the Commissioner General of Immigration, United States Department of Labor. The prewar figures include all immigrants from Asia, not merely from the areas to which the quotas apply; the maximum in any one year for Asia outside the quota areas was less than 20,000.

² J. A. Hill, forthcoming Census Monograph on *Women in Gainful Occupations*.

³ J. A. Hill, "Recent Northward Migration of the Negro," *Monthly Labor Review*, March, 1924.

⁴ The material for this section was prepared by Harry Jerome, of the National Bureau of Economic Research.

The purpose of these restrictive measures was to reduce the volume of immigration in general and that from southern and eastern Europe in particular. The expectations under the two acts, compared with conditions prevailing before the war, are indicated in Table 1.

Comparisons between the actual flow of immigration in the prewar, war, and postwar periods show that there has been a drastic reduction in the net inflow. In the prewar period, the average recorded annual net immigration was 664,000; in the war and early postwar period, 179,000; and in the quota period, 312,000. At the present time, then, the annual net immigration rate is less than half of that before the war.⁵

TABLE 2.—NET IMMIGRATION, JULY 1, 1907 TO JUNE 30, 1927^a

Period	Immigrants	Emigrants	Net immigration ^b
Prewar period (July 1, 1907 to June 30, 1914).....	6,709,357	2,063,767	4,645,590
War and early postwar period (July 1, 1914 to June 30, 1921).....	2,407,908	1,154,256	1,253,652
Quota restriction period (July 1, 1921 to June 30, 1927).....	2,473,348	600,037	1,873,311
Year ended June 30:			
1908.....	782,870	395,073	387,797
1909.....	751,786	225,802	525,984
1910.....	1,041,570	202,436	839,134
1911.....	878,587	295,666	582,921
1912.....	838,172	333,262	504,910
1913.....	1,197,892	308,190	889,702
1914.....	1,218,480	303,338	915,142
1915.....	326,700	204,074	122,626
1916.....	298,826	129,765	169,061
1917.....	295,403	66,277	229,126
1918.....	110,618	94,585	16,033
1919.....	141,132	123,522	17,610
1920.....	430,001	288,315	141,686
1921.....	805,228	247,718	557,510
1922.....	309,556	198,712	110,844
1923.....	522,919	81,450	441,469
1924.....	706,896	76,789	630,107
1925.....	294,314	92,728	201,586
1926.....	304,488	76,992	227,496
1927.....	335,175	73,366	261,809

^a Compiled from the *Annual Reports*, Commissioner General of Immigration, United States Department of Labor, for the years ended June 30, 1908-1927. Citizens of the United States and "nonimmigrant" and "nonemigrant" aliens are excluded from the data in this table.

^b Net immigration equals immigrants less emigrants.

The reduction, as it was intended, was felt largely by the groups commonly described as the new immigration. Table 3, in which comparisons

⁵ The clandestine immigration is estimated to have averaged about 85,000 per year during the six years of quota restriction and is believed now to be diminishing. The bulk of this immigration are probably residents of our neighboring countries.

are made for the same three periods and the immigration is classified by country of origin, shows that the reduction in European immigration has taken place mainly among the immigrants from southern and eastern Europe. At the same time, net immigration from both Canada and Mexico is in excess of the prewar rate.

TABLE 3.—DECLINE IN NET RECORDED IMMIGRATION INTO THE UNITED STATES, COMPARED WITH PREWAR RATES, BY COUNTRY OF ORIGIN^a
(In thousands of persons)

Country	War and early postwar period (July 1, 1914–June 30, 1921)			Quota restriction period (July 1, 1921–June 30, 1927)		
	Actual	Deficit	Excess	Actual	Deficit	Excess
All countries ^b	1,254	3,392	...	1,873	2,109	...
All Europe ^c	555	3,672	...	888	2,735	...
"Old" ^d	292	774	...	710	203	...
"New" ^d	263	2,898	...	177	2,532	...
Mexico.....	122	.....	16	297	.....	206
Canada and Newfoundland.....	433	.....	242	628	.....	465
Asia ^e	49	.....	16	13	15	...
Other countries.....	94	.....	5	48	28	...

^a Compiled from the *Annual Reports* of the United States Commissioner General of Immigration. The "deficit" or "excess" is computed by subtracting the actual net immigration (immigrants less emigrants) from the net immigration which would have taken place if the annual average for the seven years ended June 30, 1914, had been maintained.

^b The totals were computed from the full figures before reduction to thousands, hence there is an apparent small discrepancy in each column between the totals and the constituents thereof.

^c Turkey in Asia is included with Europe and excluded from Asia.

^d The so-called "old" sources of immigration include the countries of northern and western Europe, namely: Belgium, Denmark, France, Germany, the Netherlands, Norway, Sweden, Switzerland, and the United Kingdom. The "new" sources include the countries of eastern and southern Europe now known as Austria, Hungary, Czechoslovakia, Yugoslavia, Bulgaria, Finland, Greece, Italy, Poland, Portugal, Rumania, Russia, Spain, Turkey in Europe, and certain other small European countries designated as "other Europe," also Turkey in Asia. Owing to boundary changes, the prewar and postwar figures for the "old" and "new" sources are not strictly comparable, but these discrepancies are not large enough to affect materially their comparability for present purposes.

In occupation, the immigration of recent years is radically different from what it used to be. The cutting off of immigrants from the south and east of Europe has meant stopping the flow of unskilled labor, which, before the war, was the preponderant element of the immigration into the United States. The group of unskilled workers shows, in the war and early postwar period, a net immigration of only 4,000 and of 191,000 in the quota restriction period, or a decline of 1,544,000 in the war and early postwar period, and of 1,136,000 in the quota restriction period.

These changes in number, origin, and occupation have been accompanied by equally important changes in the demographic constitution of the recent immigrants. The proportion of males has dropped from 60 per cent before the war to 52 in this latest period. The proportion

TABLE 4.—DECLINE IN NET RECORDED IMMIGRATION INTO THE UNITED STATES
COMPARED WITH PREWAR RATES, BY OCCUPATION AND SEX*

(In thousands of persons)

Occupation and sex	War and early postwar period (July 1, 1914–June 30, 1921)			Quota restriction period (July 1, 1921–June 30, 1927)		
	Actual net	Deficit ^b	Excess	Actual net	Deficit ^b	Excess
Total net.....	1,254	3,392	....	1,873	2,109	...
No occupation.....	688	814	....	798	490	...
All workers ^c	565	2,578	....	1,075	1,619	...
Unskilled workers ^d	4	1,544	....	191	1,136	...
Servants.....	213	450	....	214	354	...
Skilled.....	288	442	....	417	209	...
Professional.....	50	11	....	71	.....	18
Other occupations.....	10	131	....	183	.....	62
Both sexes.....	1,254	3,392	....	1,873	2,109	...
Males.....	463	2,317	....	976	1,407	...
Females.....	790	1,075	....	898	701	...

* The "deficit" or "excess" is computed by subtracting the actual net immigration (immigrants less emigrants) from the net immigration which would have taken place if the annual average for the seven years ended June 30, 1914, had been maintained. For example, the total net immigration in the seven years ended June 30, 1914, was 4,645,590. Taking six-sevenths of this we have 3,981,934 as the "expected" net immigration for the six years of the restriction period (July 1, 1921 to June 30, 1927). In these six years, the actual net immigration was 1,873,311, leaving a "deficit" of 2,108,623.

^b For the prewar net immigration, 71,970 emigrants for whom occupation is not known were distributed among the occupations in the same proportions as those for whom occupation was given. Likewise, 29,708 emigrants in 1909 for whom sex is not known were distributed between the sexes in the same proportion as those for whom sex was given.

^c Computed by subtracting "No occupation" from "Total."

^d The classification by occupation used by the United States Bureau of Immigration has no group designated as "unskilled." We have taken the sum of "laborers" and "farm laborers" as representative of the unskilled element.

of the married appears to be slightly less now than before, and children and elderly persons seem more numerous in the recent than in the prewar immigration.

It has already been seen that our changing immigration policy and the fall in the birth rate have resulted in a slackening of the natural rate of increase of the American population; and it is clear that these factors will tend, if they have not already done so, to produce a tighter labor situation than one to which we have been accustomed. It has been pointed out in this connection, however, that compensating influences, such as the opening of unworked industrial areas or the progressive fall in mortality rates, may act as mitigating factors. To measure the accretions in population arising out of these last sources is not a feasible task. Over long periods of time, the extent to which industry draws on the population of an area is in some degree a measurable phenomenon. Thus the per cent of factory wage earners in the total population of

North Carolina was 2.1 in 1889, 4.2 in 1904, 5.6 in 1909, and 6.5 in 1925, and the probability is that little of this relative increase in factory employees was made at the expense of other employments. The same type of computation might also be made with regard to the entry of women into gainful work. But except for pointing out the existence of such changes within the population of the country, the elaboration of such measures would add little to our present knowledge.

There remains, then, some slight reference to the magnitude of the fall in mortality rates which has been a striking feature of American vital statistics of the past decades. Dr. A. J. Lotka, of the Metropolitan Life Insurance Co., has computed the figures of the number of lives saved per annum through the lowered death rate in this country by taking the United States population, as constituted in 1925, applying to it, at the several ages of life, the death rates that prevailed in 1900-1902, and then comparing the total number of deaths that would have been produced by these death rates with the actual deaths in 1925. The results of these computations are given in Table 5.

TABLE 5.—ACTUAL DEATHS IN 1925 COMPARED WITH DEATHS INDICATED IF COMPUTED ON 1900-1902 DEATH RATES

	Actual deaths, 1925	Hypothetical deaths, 1925, on basis of 1900-02 death rate	Lives saved per annum
Total, United States.....	1,389,673	1,962,999	573,326
White, total.....	1,172,251	1,655,467	483,216
White, males.....	634,785	887,793	253,008
White, females.....	537,466	767,674	230,208
Colored, total.....	217,422	307,532	90,110
Colored, males.....	112,871	163,735	50,864
Colored, females.....	104,551	143,797	39,246

While it is interesting to compare these figures of current saving of lives with the estimated deficits in immigration, it should be noted that the fall in mortality rates has been accompanied by a drop in the birth rate and that future improvements in mortality may be more difficult than they have been in the past.

II. WAGES, HOURS, AND LABOR COST

Wage rates are, for many purposes, the most useful measure of the changing position of labor. Piece or time rates represent in one number both the price of labor and its potential earning power. Actual earnings whether by the week, month, or year, measure not only the price of labor, but unemployment and the flow of work as well. Even full-time earnings for any unit of time are affected by the productivity of labor and by the

volume of employment, but this last factor does not affect full-time earnings nearly as much as it does actual earnings. While it is important to measure employment and unemployment and their effects on earnings, both the incidence and the extent of employment and unemployment are so complex that they can be best studied directly, and not indirectly through their effect on earnings.⁶

The most satisfactory measure of wages, then, is the rate of wages, time or piece. Where the actual rates are not available, the next best measure would be a record of the changes in the time and piece rates. Unfortunately it is impossible to obtain a reliable series of either rates or changes in rates. Statistics of changes in wage rates published by the United States Bureau of Labor Statistics for a part of the postwar period and for an important group of industries cannot be used because of the inadequacy and uncertainty of the sample.⁷ We are, therefore, thrown back on full-time earnings. Of the various measures of full-time earnings, hourly earnings are, for the purpose of finding changes in wage rates, the best. It is true that hourly earnings reflect not only changes in the rates of wages but the rise and fall in the productivity of labor as well. But they do not reflect unemployment, except in the minor degree in which rise and fall in unemployment increases or diminishes the flow of work, and hence increases or reduces even hourly earnings. Where, finally, hourly earnings are not available, it becomes necessary to use full-time weekly earnings whose course is affected not only by the factors already enumerated, but also by changes in the nominal or full-time week. Over short periods of time, however, these variations in the length of the nominal week can be measured and their influence partially discounted.⁸

For all studies of wages during the period from 1914 to 1927, nearly all available series are defective in one or another respect. The list of industries included in each series varies from year to year and particularly from 1914 to 1920. The samples for the industries reported are not in each year equally representative. In general, the statistics appear to improve after 1920, both by the inclusion of a greater number of industries and through the gathering of more adequate and more representative samples. The material on wages, here presented, is the result of the examination of a mass of American wage statistics, collected and interpreted by a number of independent agencies. Whatever methods of interpretation are applied to the basic data, the final results

⁶ See Henry Clay, "Unemployment and Wage Rates," *Royal Economic Journal*, March, 1928, p. 1.

⁷ *Monthly Labor Review*, July, 1928, p. 133. Similar figures are published monthly.

⁸ The questions of definition and sampling, and the meaning and reliability of American wage statistics will be considered in detail in a study, by the present author, of the statistics of the American labor market, to be published by the National Bureau of Economic Research in 1929.

show so many signs of agreement in the various series as to inspire considerable confidence in the raw statistical materials.

The Manufacturing Industries.—The most complete series of hourly earnings in the manufacturing industries is that compiled by the National Industrial Conference Board for the period from 1920 to date. The series includes some 23 representative industries and is, with interruptions in 1920 and 1922, published monthly for each industry and for all industries combined. A figure comparable with the later series is also given for July, 1914, so that it is possible to make comparisons with prewar conditions. For the years between 1914 and 1920 the Board series is incomplete and is, for that reason, not comparable with the series for the later period. Because the 1920 figures are given only for the last seven months, and the 1922 figures only for the last six months, it is impossible to pick with certainty the high month of the boom and the low month of the depression. The trend is such, however, that this gap appears to introduce no substantial error. The hourly rates for all industries combined are shown in the following statement:

July 1914.....	\$0.25
Average:	
1920.....	.61
1921.....	.52
1922.....	.49
1923.....	.54
1924.....	.56
1925.....	.56
1926.....	.56
1927.....	.57

Hourly earnings for this group of industries advanced 149 per cent from 1914 to September, 1920; fell 22.3 per cent from September, 1920, the known peak, to July, 1922, the known bottom; rose again more than 20 per cent from July, 1922 to September, 1927; and stood in 1927 at 128 per cent above 1914.

It is impossible to match the Board series with a similar series from any other reliable source of information. By assuming, however, that the week of highest actual per capita earnings was also the week of full-time earnings, it has been possible to compute, from monthly data published by the United States Bureau of Labor Statistics, the average full-time weekly earnings for 12 important and representative manufacturing industries for each year from 1917 to 1927 and for 42 manufacturing industries from 1923 to 1927. The 12 industries employed, according to the census of manufactures of 1925, 2,856,160 wage earners, and the 42 industries 5,832,302, out of a total of 8,384,261 wage earners. The results of these computations are shown in Table 6. In this series, full-time weekly earnings increased 58 per cent from 1917 to 1920; fell 20 per cent from 1920 to 1922; and were, in 1927, 16.8 per cent below 1920.

TABLE 6.—AVERAGE FULL-TIME WEEKLY EARNINGS

Year	Full-time weekly earnings	
	Twelve industries	Forty-two industries
1917.....	\$20.65	.....
1918.....	26.37	.....
1919.....	28.78	.....
1920.....	32.57	.....
1921.....	27.62	.....
1922.....	26.04	.....
1923.....	27.58	\$27.67
1924.....	27.51	27.48
1925.....	27.45	27.75
1926.....	27.03	27.66
1927.....	27.09	27.74

But changes in full-time weekly earnings are obviously not comparable with changes in hourly earnings, since full-time weekly earnings vary with changes in the length of the work-week. To put both series on a comparable basis, there was derived the weighted average full-time hours per week for the 12 industries. The full-time week, from these computations, was found to be 56 hours in 1917, 53 hours in 1920, 53 hours in 1922, and 51 hours in 1923 and thereafter.⁹ Applying these weighted averages of full-time hours per week to the statistics of full-time earnings per week in the 12 industries, hourly earnings in the crucial years are found to be as follows:

1917.....	\$0.37
1920.....	.62
1922.....	.49
1923.....	.54
1927.....	.53

To make the same conversions for the 42 industries would require computing the average full-time hours per week for that group, an extremely laborious task. All of the available data appear to indicate that the prevailing average nominal week since 1923 in all manufacturing industry has fluctuated around 51 hours. Average hourly earnings in the 42 industries, then, were approximately 54 cents in each year since 1923. Comparisons between the hourly earnings reported by the Conference Board and the hourly earnings computed by this method show that, whereas the first fell 22.3 per cent from September, 1920 to July, 1922, the second series fell in the same period 20 per cent; while the Board's hourly earnings increased 16 per cent from 1922 to 1927, the increase in

⁹ There are from year to year fractional differences in the full-time hours per week, but they are so slight that they may be disregarded.

the computed hourly earnings was 8 per cent. At the close of the whole period, however, the difference between the two series of between 3 and 4 cents an hour might easily be accounted for by differences in sampling, by minor, but undiscoverable, errors in computing the average full-time hours per week, and by the fact that comparisons of the Bureau's series were between averages for the year and not between high and low months.

Among the many industries that make up the group of manufacturing industries, there have been great divergencies in the rate of increase over prewar levels and in the movement since 1920. Table 7, showing hourly earnings in a few selected industries, throws some light on the behavior of wages in different industries. Increases in wages in the boot and shoe

TABLE 7.—HOURLY EARNINGS IN SELECTED INDUSTRIES

Industry	1913	1920	1921	1922	1923	1924	1925	1926	Per cent increase, latest year over 1913
Boots and shoes.....	\$0.31	\$0.56	.....	\$0.50	.....	\$0.52	.....	\$0.53	71
Clothing, men's.....	.26	.....	.....	.73	.....	.76	.....	.75	188
Cotton goods.....	.16	.48	.....	.33	.....	.37	.....	.33	106
Hosiery and knit goods.....	.17	.....	.....	.35	.....	.41	.....	.44	159
Iron and steel.....	.30	.75	.....	.51	.....	.64	.....	.64	113
Lumber.....	.19	.....	\$0.33	.....	\$0.36	.....	\$0.36	.....	90
Woolen and worsted.	.20	.63	.....	.47	.....	.53	.....	.49	145

industry appear to have lagged throughout the whole period, although the rates recovered from their fall in 1922. Both cotton goods and woolen and worsteds hardly recovered from the low of 1922. Iron and steel on the other hand had a rise of 13 cents an hour. Important industries not included in this table, because no data are available for most of the period, have had substantial increases in their hourly earnings since 1922. Hourly earnings in the automobile industry are reported as 66 cents in 1922 and 72 cents in 1925; and in foundries and machine shops as 56 cents in 1923 and 63 cents in 1927.¹⁰

The Building Trades.—The building industry in the United States is probably at the present time more than 50 per cent unionized and is, in the large cities, except for the outlying districts, almost completely organized. For this reason, the movement of union rates of wages gives a fair representation of the general movement of wages in the industry. Union rates of wages in the building industry, as in all industry, exaggerate the inelasticity of prevailing wage rates, since many concessions in rates commonly made during periods of depression and slack business

¹⁰ All of the figures in this paragraph are taken from the reports of the United States Bureau of Labor Statistics.

are not adequately reported. In general, it is fair to say that union rates actually paid rise higher in periods of prosperity, and fall lower in periods of depression, than the recorded rates indicate. But there is no statistical evidence for this suspicion.

Union rates of wages in the building industry show an almost uninterrupted rise from 1914 to the present. In the war and early postwar

TABLE 8.—WEIGHTED UNION HOURLY RATES OF WAGES IN THE BUILDING TRADES*

Year	Rate	Year	Rate
1914.....	\$0.53	1921.....	\$1.03
1915.....	.53	1922.....	.96
1916.....	.55	1923.....	1.07
1917.....	.58	1924.....	1.15
1918.....	.65	1925.....	1.20
1919.....	.75	1926.....	1.28
1920.....	1.02	1927.....	1.32

* United States Bureau of Labor Statistics. The actual rates from 1914 to 1920 are not published by the Bureau, but were computed from the Bureau's index numbers.

period, wages rose, from 1914 to 1921, 94 per cent. They fell from 1921 to 1922 only 7 per cent and rose again from 1922 to 1927 by 38 per cent, leaving the building trades union rates 149 per cent higher in 1927 than they were in 1914. It must be remembered, of course, that the American building industry has had since 1922 an unusual and prolonged wave of prosperity.

As in all American wages, there are wide geographical divergencies in the union rates in the building industry. A compilation of the rates of wages in 1927 of five important occupations in various cities of the country shows that the high rate is sometimes nearly twice the low rate. These differences, moreover, persist over a long period, but the relative position of the cities does not remain unchanged. In all five occupations, for

TABLE 9.—RATES OF WAGES IN FIVE IMPORTANT OCCUPATIONS, 1927

City	Bricklayers	Carpenters	Painters	Plasterers	Plumbers and gas fitters
Atlanta.....	\$1.40	\$0.80	\$0.85	\$1.25	\$1.25
Philadelphia.....	1.63	1.25	1.05	1.75	1.15
St. Louis.....	1.75	1.50	1.44	1.75	1.50
Los Angeles.....	1.38	1.00	1.00	1.50	1.13
Seattle.....	1.45	1.13	1.13	1.38	1.38
New York.....	1.75	1.50	1.63	1.75	1.50
Chicago.....	1.63	1.50	1.50	1.63	1.50

example, the rates in Seattle were, in the years 1917, 1918, and 1919, always higher than those of New York City and nearly always higher

than the rates of Chicago. Such variations in the rank of these cities have, however, been rare.

Union Rates of Wages.—An index number of union hourly rates of wages for all reporting trades, prepared by the United States Bureau of Labor Statistics,¹¹ pursues much the same course as that taken by union rates in the building trades. They rise 105 per cent from 1913 to 1921; drop 6 per cent in 1922; increase 35 per cent from 1922 to 1928; and stand, in 1928, 161 per cent above 1913. At the end of the period, also, the rates are probably higher than they are in industry generally, although it must be remembered that the union rates are almost without exception rates of wages for male workers. Changes in the rates for specific occupations, shown in Table 10, exhibit no startling divergencies from the movement of wages in the building industry. But the freight handlers have a much greater drop in 1922 than the others. The striking feature of this tabulation, as indeed of the index number of all union rates, is the slight decline in rates during the severe depression of 1920 to 1922 and the decided upward movement since 1922.

TABLE 10.—CHANGES IN HOURLY RATES OF WAGES IN SPECIFIED OCCUPATIONS.

Occupation	Hourly rate, 1928	Per cent change in hourly rate			
		1913-1921	1921-1922	1922-1928	1913-1928
Bakers.....	\$0.95	+179	- 4	+ 7	+186
Compositors (book and job).....	1.12	+120	+ 2	+12	+150
Pressmen, cylinder (book and job)...	1.13	+106	- 2	+16	+133
Compositors, day (newspapers).....	1.18	+ 75	+ 1	+17	+107
Chauffeurs.....	.71	+103	- 6	+27	+143
Freight handlers.....	.86	+137	-17	+27	+149

It cannot be said that the index of union rates of wages is a satisfactory measure of the movement of union wages in the United States. It is, in the first place, heavily weighted for the building and printing industries, which together comprise 73 per cent of the total Bureau sample. Both industries are notoriously in large measure sheltered or noncompetitive industries, in which wages are not nearly so sensitive to changing market conditions as they are elsewhere. The large drop in the rate of wages of freight handlers has already been noted. The rates of pattern makers and of iron molders dropped, likewise, 11 and 18 per cent respectively, from 1920 to 1922. It is clear that a more representative sample of union rates would yield a measure showing more frequent and wider fluctuations than the present one.

The Bureau index, also, is by no means a measure of union rates of wages in the category of manufacturing industries. An examination of

¹¹ United States Bureau of Labor Statistics, *Bulletin* No. 457.

the union membership covered by the Bureau report shows that, except for the printing and publishing industry, practically no representation at all is given to manufacturing industries. The following statement¹² shows a list of trade groups and the total number of union members in each group.

Bakers.....	19,170
Building trades.....	539,423
Chauffeurs, teamsters, drivers.....	81,260
Granite and stone trades.....	5,796
Laundry workers.....	3,876
Linemen.....	3,464
Longshoremen.....	40,212
Printing and publishing:	
Book and job.....	57,832
Newspaper.....	27,586
Street railways: motormen and conductors.....	57,289
Bus drivers.....	2,730
Barbers.....	23,670
Total.....	862,308

Unskilled and Common Labor.—Wages of this category of labor will vary with the nature of the statistical sample and with the definition of the terms “unskilled” and “common” labor. It is indeed clear from the available data that the category is far from homogeneous and includes classes of labor that work at a great diversity of rates. In general, the designations appear to apply to low-priced, usually manual male labor,

TABLE 11.—WAGES OF UNSKILLED OR COMMON LABOR, 1914-1927

Year	National Industrial Conference Board ^a	New York Federal Reserve Bank ^a	United States Bureau of Labor Statistics ^b
1914.....	¢\$0.20	\$0.20	\$0.34
1915.....		.20	.34
1916.....		.23	.35
1917.....		.27	.39
1918.....		.35	.46
1919.....		.43	.52
1920.....	.55	.51	.75
1921.....	.45	.47	.76
1922.....	.41	.37	.71
1923.....	.45	.46	.73
1924.....	.47	.48	.81
1925.....	.47	.47	.77
1926.....	.48	.49	.85
1927.....	.49	.49	.85

^a Average for the year.

^b May 1 for the years 1914 and 1915, and May 15 for each year since 1916. The actual rates from 1914 to 1920 are not published by the Bureau, but were computed from the Bureau's index numbers.

^c July.

¹² United States Bureau of Labor Statistics, *Bulletin* No. 457, p. 1.

and if they are so understood the statistics of wage rates for the class follow a consistent course. Table 11 presents three independent series of the wages of common or unskilled male labor from 1914 to the present. One series, that of the National Industrial Conference Board, represents the average hourly earnings of unskilled labor in more than 20 manufacturing industries throughout the United States. The second is the hourly hiring rate for common labor in the New York Federal Reserve district, compiled by the Federal Reserve Bank of New York; and the third is the average hourly union rate of wages for building laborers throughout the whole of the American building industry, published by the United States Bureau of Labor Statistics. In this case, as in general, the use of annual averages conceals somewhat the range of fluctuation of the rates of wages, but it is often impossible to find more than a single figure for a year. In Table 12, showing the changes in the wage rates of unskilled and common labor, some attempt is made to find the high and low points and to compute the percentage changes from them, but this procedure does not produce striking modifications in the final results.

TABLE 12.—CHANGES IN WAGE RATES OF UNSKILLED AND COMMON LABOR

Period	Changes in rates (per cent)		
	National Industrial Conference Board	New York Federal Reserve Bank	U. S. Bureau of Labor Statistics
1914 to 1920.....	^a +175	^b +165	+124
1920 to 1922.....	^c - 27	^d - 32	- 7
1920 to 1927.....	^e - 11	^e - 4	+ 13
1914 to 1927.....	^e +145	^e +145	+150

^a July, 1914 to September, 1920.^d October, 1920 to April, 1922.^b Average for 1914 to October, 1920.^e Average for the year.^c September, 1920 to July, 1922.

A new series of hourly entrance rates for adult male common labor, compiled first quarterly and later semiannually by the United States Bureau of Labor Statistics since January 1, 1926,¹³ runs from 6 to 8 cents an hour lower than both the Conference Board and Federal Reserve Bank rates, and, of course, considerably below the union rates of building laborers. Not only is the Bureau sample larger than the others, but its geographical diversity tends to reduce the average hiring rate for the country. Even within any single area, the difference between the high and low rate is occasionally as much as 80 cents an hour. If, further, the rates for common labor employed in general contracting are excluded, the Bureau hiring rate for common labor is often reduced by several cents more. From January 1, 1926 to January 1, 1928, this hourly rate

¹³ *Monthly Labor Review*, February, May, September, December, 1926; March, October, 1927; April, 1928.

for the whole country has increased from 40 to 43 cents an hour. On January 1, 1928, when the average rate for the United States was 43 cents an hour, the rates in various sections of the country were as shown in the following statement:

New England.....	\$0.47
Middle Atlantic.....	.49
East North Central.....	.47
West North Central.....	.41
South Atlantic.....	.29
East South Central.....	.27
West South Central.....	.31
Mountain.....	.44
Pacific.....	.47

With the full employment of labor during the war years, and the restriction of immigration, first by the war and later by legislation, it has been commonly believed that the differentials between the wage rates of skilled and unskilled labor or between high- and low-paid labor have

TABLE 13.—DIFFERENCE IN WAGE RATES OF SKILLED AND UNSKILLED LABOR

Year	Per cent average hourly earnings of male unskilled are of male skilled ^a	Per cent average hourly union rate of building laborers is of bricklayers ^b
1914.....	72.5	47.6
1920.....	79.0	62.4
1921.....	75.1	63.7
1922.....	72.6	61.3
1923.....	73.2	55.1
1924.....	73.8	57.9
1925.....	73.8	52.4
1926.....	73.6	54.4
1927.....	75.2	53.3

^a Computed from the statistics of the National Industrial Conference Board for 23 manufacturing industries.

^b Computed from the statistics of the United States Bureau of Labor Statistics.

been, since 1914, appreciably reduced. This belief is only partially supported by the available facts. Inspection of the wage statistics of many individual industries yields much the same conclusions as can be drawn from Table 13. The margins between the wage rates of skilled and unskilled labor narrowed considerably from 1914 to 1920 and then tended to widen, but were left somewhat narrower in 1927 than they were before the war. The slight variations that appear from year to year are probably the accidental results of changing samples and should be considered of little significance.

The Coal Industry.—Wages in the bituminous coal industry have followed a different course during the period under review because of

factors peculiar to the soft coal industry. The industry has for a long time been partially unionized. During the war, organization spread very fast and the union extended its control over parts of the non-union area. Those coal fields which remained unorganized possessed great powers of expansion in output which they were able to exploit whenever they received a competitive advantage over their unionized competitors. Such competitive advantage non-union operators usually enjoy in periods of depression, when both working conditions and wages are more elastic in the unorganized than in the organized mines; and also whenever their organized competitors are shut down by strikes. Conditions such as these, which prevail in varying degrees in all industries that are part union and part non-union, have in this industry played the determining rôle in the years since the war. Rigidity in union rates has been accompanied by great elasticity in the non-union rates, with the result that the area of union control has, since 1920, steadily contracted. Although factors such as freight rates and differences in the efficiency of management have, without a doubt, exerted a strong influence on the situation, they have probably acted to reinforce trends created by the wage structure.

In both the union and non-union mines, wages rose steadily from 1914 to 1920. The trend of union rates of wages for tonnage men and for day labor is shown in Table 14.¹⁴ The first class increased from 1914 to 1920 by 77 per cent and the rates for day labor, 162 per cent. Aside from the marked divergence between the rates of increase of tonnage and day labor, the significant item in the table is the fact that the rates

TABLE 14.—TREND OF UNION RATES OF WAGES

Year	Index numbers of tonnage rates for pick miners at Illinois and Indiana basing points (1914 = 100)	Date	Day rates for day labor	
			Actual rate	Index numbers (Apr. 1, 1914 = 100)
1914.....	100	April 1, 1914.....	\$2.86	100
1915.....	100	April 1, 1916.....	3.00	105
1916.....	105	April 15, 1917.....	3.60	126
1917.....	121	October 6, 1917.....	5.00	175
1918.....	138	November 26, 1919.....	5.67	198
1919.....	138	April 1, 1920.....	6.00	210
1920.....	177	August 16, 1920.....	7.50	262
1921.....	177	August 15, 1922.....	7.50	262
1922.....	177	April 1, 1923.....	7.50	262
1923.....	177			

¹⁴ The data in this table are adapted from Isador Lubin, *Miners' Wages and the Cost of Coal*, pp. 230, 236.

reached at the peak of 1920 remained unchanged through the period from 1920 to 1923.

Non-union rates also rose from before the war until 1920 and probably at a more rapid rate than the union rates, since the prewar base rates were lower in the non-union mines. But for the few years immediately after 1920, the non-union rates reacted swiftly and violently to changing business conditions. They fell, as is here indicated, in the first half of 1921, again in the second half, once more in 1922, and then rose sharply in 1923. From the peak to the low point, in this period, pick-mining rates in West Virginia fell 28 per cent, in Kentucky 27 per cent, while rates for machine cutting were reduced 25 per cent and 34 per cent in West Virginia and Kentucky, respectively. Much the same thing happened to the rates of day labor. While the going rates of union day labor were from \$7.25 to \$7.50 a day, the non-union rates fell as low as \$4.10.¹⁵

TABLE 15.—PICK-MINING AND MACHINE-CUTTING RATES, IN WEST VIRGINIA AND KENTUCKY^a

Year	Index numbers of non-union rates (Jan. 1, 1912 = 100)			
	Pick mining		Machine cutting	
	West Virginia	Kentucky	West Virginia	Kentucky
1920 (first half).....	211	215	210	196
1920 (second half).....	225	225	214	213
1921 (first half).....	219	209	214	193
1921 (second half).....	205	170	204	173
1922 (first half).....	163	164	160	141
1923.....	222	212	212	183

^a The data in this table were computed from the statistics published in the reports of the United States Coal Commission, 1925.

In 1923 the United Mine Workers entered into a new agreement with the operators, the famous Jacksonville agreement, by which terms the rates of wages then prevailing were made effective for five years. As

¹⁵ See Lubin, *op. cit.* p. 211, from which the following table, showing the day rates paid to inside labor in the non-union Winding Gulf District of West Virginia, is taken:

	Sept. 1, 1920	Sept. 1, 1921	Jan. 1, 1922	Aug. 16, 1922
Machine runners.....	\$7.58	\$6.08	\$4.68	\$7.58
Trip riders.....	6.92	5.55	4.10	6.77
Drivers, one mule.....	6.72	5.40	4.15	6.65
Track layers.....	7.37	5.92	4.55	7.37
Timbermen.....	7.37	5.92	4.10	7.05
Bratticemen.....	7.37	5.92	4.10	7.05
Unclassified day labor.....	6.64	5.33	4.10	6.60

TABLE 16.—HOURLY EARNINGS IN THE BITUMINOUS COAL INDUSTRY^a

Selected occupations	Hourly earnings						
	Union fields			Non-union fields			
	Illinois	Indiana	Ohio	Ala- bama	Penn- syl- vania	Ken- tucky	West Virginia
Pick miners:.....							
1922.....	\$0.81	\$0.78	\$0.84	\$0.49	\$0.70	\$0.77	\$0.95
1924.....	.85	1.01	.91	.53	.71	.71	.76
1926.....	.85	.97	.81	.49	.70	.60	.73
Machine cutters:							
1922.....	1.41	1.75	1.28	.58	.99	1.09	1.29
1924.....	1.38	1.61	1.18	.78	1.05	.87	1.06
1926.....	1.36	1.51	1.11	.83	1.04	.91	1.11
Inside mine:							
Trackmen—							
1922.....	.94	.94	.94	.47	.75	.71	.78
1924.....	.94	.94	.93	.46	.81	.61	.62
1926.....	.94	.93	.92	.45	.74	.57	.61
Motormen—							
1922.....	1.01	1.01	.94	.43	.93	.69	.78
1924.....	1.01	1.02	.92	.47	.85	.62	.62
1926.....	1.01	1.01	.81	.45	.77	.60	.62
Bratticemen—							
1922.....	.94	.94	.94	.42	.70	.69	.76
1924.....	.94	.94	.93	.44	.80	.62	.61
1926.....	.94	.92	.98	.45	.75	.60	.61
Outside mine:							
Blacksmiths—							
1922.....	.97	.88	.96	.55	.79	.77	.85
1924.....	.97	.88	.96	.51	.82	.62	.69
1926.....	.97	.88	.94	.52	.76	.59	.69
Engineers—							
1922.....	.96	.90	.86	.50	.75	.78	.61
1924.....	.97	.87	.93	.54	.82	.57	.59
1926.....	.96	.84	.92	.45	.81	.57	.62
Laborers—							
1922.....	.86	.85	.85	.33	.57	.53	.58
1924.....	.86	.85	.86	.28	.63	.47	.48
1926.....	.86	.83	.85	.29	.56	.44	.48

^a Figures taken from United States Bureau of Labor Statistics, *Bulletin No. 454*.

these five years passed, the union rates were progressively less observed because operators broke their agreements with the union and opened their mines under non-union conditions, and because an increasing number of union members took work at rates below the union scale. Wages in the

industry accordingly fell through 1926. Hourly earnings of tonnage workers throughout the industry were 85 cents in 1922, 78 cents in 1924, and 75 cents in 1926; and the average hourly earnings of inside and outside day workers were, for the same years, 75 cents, 70 cents, and 66 cents, respectively.¹⁶

Throughout this period, hourly earnings were persistently lower in the non-union than in the union fields. The salient facts of this condition are shown in Table 16. The division between union and non-union area is not so sharp as appears in this table. Pennsylvania, which is partly unionized, is included in the non-union group because it has in the past few years become increasingly non-union and because rates of wages in the state are now more determined by conditions of the competitive market than by the union scales of wages.

It is probable that wages throughout the industry are lower now than they were in 1926. In the late summer of 1928, the union for all practical purposes abandoned the scales of the Jacksonville agreement, authorized the district organizations to make their own agreements with the operators, and is reported to have settled with the union operators of Ohio for rates $33\frac{1}{3}$ per cent below the 1923 scale and in Illinois at a reduction of 18.7 per cent.

Anthracite Coal.—The anthracite coal industry is localized in one small area in Pennsylvania and is practically altogether unionized. Wages are fixed almost exclusively by negotiations between the union, the United Mine Workers, and the anthracite operators, and occasionally by the awards of arbitration boards. The movement of wage rates in the industry shows none of the vagaries of the confused and demoralized soft coal industry. Statistics collected independently by two agencies, the United States Bureau of Labor Statistics¹⁷ and the National Industrial Conference Board,¹⁸ come to much the same conclusions. Hourly earnings for all workers in the industry, excluding contract miners' laborers stood in April, 1927, 194 per cent above the hourly rate in June, 1914. While the Bureau figures indicate a greater rise from 1920 to 1924 than do the statistics of the Conference Board, the discrepancies are mainly attributable to the fact that the Bureau pay roll period was the last half of March, 1920, and the Board's October, 1920. Again the lower average hourly earnings for all workers in the Board's report is in part explained by the omission of the hourly earnings of contract miners' laborers, who, in 1924, had average hourly earnings of 97 cents. The hourly earnings of contract miners are reported by the Board as \$1.20 in December, 1924, and by the Bureau as \$1.43 during the last quarter of the same year.

¹⁶ United States Bureau of Labor Statistics, *Bulletin* No. 454.

¹⁷ *Ibid.*, *Bulletins* No. 279 and No. 416.

¹⁸ *Wages in the United States, 1914-1927*, New York, 1928, Chap. V

TABLE 17.—HOURLY EARNINGS OF ALL WAGE EARNERS IN THE ANTHRACITE COAL INDUSTRY

Period, last half of—	National Industrial Conference Board (less contract miners' laborers)	Year	United States Bureau of Labor Statistics
June, 1914.....	\$0.28	1919.....	\$0.60
October, 1920.....	.76	1920.....	.63
March, 1921.....	.76	1922.....	.80
June, 1921.....	.75	1924.....	.92
October, 1921.....	.74		
July, 1923.....	.75		
December, 1923.....	.83		
December, 1924.....	.83		
April, 1927.....	.84		

Full-time Hours of Labor.—Measurement of the length of the full-time or nominal work-week is likely to involve some error because of the confusion between the nominal and actual hours of work. In busy periods the two figures will closely approximate one another, but in slack times they may be far apart. In reporting full-time hours per week there is some evidence that accurate allowance is not always made for short time and for overtime. Comparison between various series of full-time hours per week does not indicate, however, that the errors so introduced are large or that they have any discernable bias during periods of rising and falling business. As the basis for the computation of piece

TABLE 18.—FULL-TIME HOURS PER WEEK

Year	United States Census of Manufactures ^a	National Industrial Conference Board Manufacturing Industries	United States Bureau of Labor Statistics	
			All union ^b	Union building trades
1909.....	57.3	.....	.....	.....
1914.....	55.6	55.0	48.9	.....
1919.....	51.2	.....	.....	.....
1920.....	.....	50.0	45.8	.....
1921.....	50.7	49.7	45.9	.....
1922.....	.....	50.0	46.1	.....
1923.....	51.1	50.0	46.1	.....
1924.....	.....	49.8	45.9	43.9
1925.....	.....	49.9	45.5	44.0
1926.....	.....	49.8	45.4	43.8
1927.....	.....	49.6	45.2	43.7

^a Computed from the census classified statistics of hours, by assuming from 1919 to 1923 the group over 60 hours to be 60 hours and the group of 44 and under to be 44 hours; for the census years 1909 and 1914, the group over 72 hours is assumed to be 72 and the group 48 and under to be 48 hours. The error so introduced is slight and has the effect of understating the nominal week in the early years.

^b Computed from index numbers published by the United States Bureau of Labor Statistics, *Bulletin* No. 457, for the years 1914 to 1920.

^c July, 1914.

and time rates of wages and as a measure of the volume of available leisure for the working population of the country, full-time hours per week is a statistical series of considerable importance and interest.

Changes in the nominal week since the war are presented in Table 18. They show, for manufacturing industries, a reduction in the nominal week of roughly five hours from 1914 to the present and they also show that prevailing hours are now around 50 a week. The union full-time week is nearly four hours less a week than in 1914, and started in that year much below the nominal week in all manufacturing industries. The union nominal week in the building industry appears to be about two hours less than in 1914, and is still falling as a result of the 40-hour movement in that industry. A large part of the building trades was already on a 44-hour basis in 1914, so that the reduction in their nominal week has been slower than for the remainder of industry. The nominal week of the bricklayers was 44.6 hours in 1913 and 43.8 in 1927; of the painters, 45.1 in 1914 and 42.6 in 1927; and of building laborers, 47.2 and 44.8 in the same two years.

The largest reduction in hours seems to have been in the iron and steel industry, where the nominal week was 66 hours in 1913, 63 in 1920, and 54 in 1926. Hours in the men's clothing industry dropped from 52 in 1913 to 44.3 in 1926; and in cotton goods they fell from 57.3 in 1913 to 51.8 in 1920, but rose again to 53.3 in 1926.¹⁹

Labor Costs.—Statistics of labor cost are not available in any useful quantity. Light on the probable movements of labor cost can best be obtained from an examination of the data on per capita output presented in the following section of this chapter. The matter of labor cost is, however, so closely connected with that of wages and hours that it merits some additional slight discussion at this point. From the peak of business activity in 1920 to the bottom in 1922, there was a substantial reduction in labor cost owing to the increased per capita output of labor and to a reduction in the rate of wages in manufacturing industries that must have been greater than 25 per cent.²⁰ After 1922, hourly earnings in the manufacturing industries rose until 1927, probably between 10 and 15 per cent. But this rise in earnings was accompanied by an uninterrupted rise in the per capita output of labor, at a rapid rate until 1925 and more slowly in the years 1926 and 1927. Since 1922 it is more than likely that labor cost has continued to fall through further reductions in the rates of wages, but that earnings have been sustained by the increasing per capita output.

¹⁹ *Bulletins*, United States Bureau of Labor Statistics.

²⁰ Hourly earnings in the manufacturing industries decreased between 20 and 25 per cent from 1920 to 1922; but, since hourly earnings are a function of both the rate of wages and of output, it is clear that, in a period of rising per capita output, rates must necessarily have had a greater reduction. How much, it is impossible to determine.

These conclusions appear, in some degree, to be supported by what may be regarded as an indirect measure of relative labor cost. The percentage that total wages are of value added by manufacture seems, particularly in the period since 1919, to move up and down with changes in the output of labor. The category of "value added by manufacture" is itself composed of so many items that changes in the relation between wages and value added may in part be due to variations in constituents other than wages. For the period since 1919, however, this does not appear to be the case. The two series are presented in the following tabulation.

Census year	Per cent wages of value added by manufacture ^a	Per capita output (1899 = 100) ^b	Census year	Per cent wages of value added by manufacture ^a	Per capita output (1899 = 100) ^b
1899.....	41.6	100.0	1919.....	42.1	104.5
1904.....	41.5	104.0	1921.....	44.8	107.3
1909.....	40.2	109.6	1923.....	42.7	132.5
1914.....	42.0	108.5	1925.....	40.1	145.4
			1927.....	39.3	149.5

^a United States Census of Manufactures. ^b See next section.

The data in this table are clearly not comparable over long intervals, since so many factors in the situation have changed to an unknown degree. From 1919 on, they appear to run true to form. It is at first surprising that the percentage that wages are of value added by manufacture should have stood so high in 1921. Per capita output did not have its substantial rise until 1922, and it was, probably, not until 1922 and 1923 that industry had fully adjusted itself to more efficient methods of manufacture.

III. THE PRODUCTIVITY OF LABOR²¹

The measures of the per capita output of labor considered in this section are not measures of the specific productivity of labor.²² They are the results of comparisons between the total physical output of industry and the number of wage earners employed in producing it. They are not indicative of the changing efficiency of labor. Such measures could be derived from comparisons between the output of industry and the number of man-hours worked by labor. But

²¹ The material for this section was collected and prepared by Woodlief Thomas, formerly of the Division of Research and Statistics of the Federal Reserve Board.

²² For an interesting attack on this aspect of the problem, see C. W. Cobb and P. H. Douglas, "A Theory of Production," *American Economic Review*, Supplement, Vol. XVIII, No. 1, March, 1928, p. 139.

statistics of man-hours are not available until very recent times and then only for a limited number of industries. Where both measures are to be had, they show wide discrepancies. Thus railroad traffic volume per worker increased by 56 per cent from 1899 to 1925, but traffic units per man-hour have been estimated to have increased in the same period by 100 per cent.²³

Changes in the per capita output of labor, as in total output, may clearly be due to a variety of factors.²⁴ In the long run, the levels of education and skill of the working population of a country, the growth of capital and the use of machinery, the alertness and ingenuity of management, and the state of science may determine both the direction and the rate of change of industrial production. During shorter periods, accidental or abnormal factors, such as apparently operated from 1916 to 1921, like sudden changes in the length of the work-week, marked variations in the efficiency of labor, resulting either from the state of mind of the workers, from the carelessness of management, or from the replacement of experienced by inexperienced workmen, may conceivably not only interrupt the prevailing trend of production, but also change its direction. The segregation and weighing of all of these factors, or even of the most important of them, are not possible in the present state of knowledge. The most that can be done is to appeal to reasonable hypotheses and to informed common knowledge.²⁵

²³ United States Bureau of Labor Statistics, *Monthly Labor Review*, March, 1927, p. 1.

²⁴ See Productivity per Worker, Chap. II, Industry, Part 1, p. 81; Part 2, p. 103; Chap. III, Construction, p. 248; Chap. IV, Transportation, Part 1, p. 285; Chap. VII, Management, pp. 512-514; Chap. VIII, Agriculture, p. 602.

²⁵ Both of the elements of the formula for deriving per capita output have serious, if irremediable, defects. The measures of the total output of industry are better for the mining and transportation industries than they are for manufacturing and agriculture; and they do not include the highly important construction industry, for which there are no satisfactory statistics of either physical output or employment. They cannot, by their very nature, take into account changes in the character and quality of the products of industry. Since the statistics of the production of raw materials or of commodities in their early stages of fabrication are more numerous than statistics of highly fabricated goods, the measures are too heavily weighted for raw materials and, consequently, underestimate the rise in total output. In general, there is less material for the new and growing industries than for the old established ones, whose rate of growth has probably already slackened before the compensating influence of the growth of the young industries can make itself felt in the measure of total output. And it is, finally, not always certain that the changing importance of industries is adequately allowed for in the weights used for the computation of average changes in total production.

The employment indexes are probably superior for the manufacturing and transportation industries than for the rest. For manufacturing they are much more reliable in the later than in the early years, although one important series, that of the United States Bureau of Labor Statistics, appears to exhibit a downward bias even during the latest years. All of the series, finally, register the amount of work done

Index Numbers of Production.—The most comprehensive index of production now available is an index of manufactures compiled on the basis of data taken from the biennial censuses of manufactures.²⁶ Current measures of the growth of manufactures are also provided by the annual index of the Harvard Economic Committee and by the monthly index of the Federal Reserve Board. Both of these indexes have been used with the census index as a basis for interpolation for intracensal years and for extrapolation for the years since 1925, the date of the last published census. It is believed that the resultant series, shown in Table 19, is a reasonably accurate measure of annual changes in manufacturing output. The census index is made up of 138 different products series, representing production in 55 industries, with an aggregate value added by manufacture equal to nearly 50 per cent of the value added for all industries. Both directly and indirectly the series represents groups of industries with 90 per cent of the total value added by manufacture. The indexes used for the noncensus years represented about 40 per cent of total production directly and another 40 per cent indirectly.

Making index numbers of agricultural production involves difficulties that cannot always be overcome. Shifts from the production of dairy and other animal products on a small scale to large-scale commercialized operation, the increasing output of commercial fruit and vegetable crops,

by the number of people employed and not by the time worked, and this procedure, as it has already been indicated, may involve misleading conclusions.

The commodities that enter into the aggregate production of a country cannot all be recorded in the same unit. The simplest method of reducing all goods to a common denominator is to express them in pecuniary units. Variations in the resultant aggregates, however, would then reflect changes both in physical output and in prices. Correction for price changes, for many well-known reasons, raises as many problems as it solves. Resort must then be had to the device of the index number, which is an average of the measures of relative changes in the items of a heterogeneous series. In place of aggregates of incommensurable units, such as bushels, feet, tons, trucks, and so on, the index number registers the weighted average of all changes in the number of units of output of the commodities under consideration. Even the construction of index numbers involves the difficult problem of discovering the importance of each industry, so that the changes in the output of each product may be properly weighted. In making the index numbers of this section, value added by manufacture or total value of output were used as weights.

For descriptions of the methods of constructing production indexes, see Day and Thomas, *The Growth of Manufactures*, United States Census Bureau, Monograph No. IX, Chapters I and II and Appendix A; Woodlief Thomas, "Construction of an Index Number of Production," *Journal of the American Statistical Association*, September, 1927; Walter W. Stewart, "An Index Number of Production," *American Economic Review*, March, 1921; E. E. Day, W. M. Persons, and E. D. Coyle, "An Index of the Physical Volume of Production," *Review of Economic Statistics*, September, 1920–January, 1921.

²⁶ Compiled for the Census Bureau by E. E. Day and W. Thomas, continuing the similar index constructed for the quinquennial censuses by Persons and Coyle. See Census Monograph No. IX.

TABLE 19.—INDEX OF PRODUCTION OF MANUFACTURES, 1899-1927^a

Year	Index (1899 = 100)	Year	Index (1899 = 100)	Year	Index (1899 = 100)	Index (1919 = 100)
1899 ^b	100.0	1909 ^b	159.2	1919 ^b	213.7	100.0
1900.....	101	1910.....	162	1920.....	221.4	103.6
1901.....	112	1911.....	155	1921 ^b	169.7	79.4
1902.....	122	1912.....	179	1922.....	222.2	104.0
1903.....	124	1913.....	185	1923 ^b	260.7	122.0
1904 ^b	122.2	1914 ^b	169.4	1924.....	244.7	114.5
1905.....	144	1915.....	188	1925 ^b	274.6	128.5
1906.....	154	1916.....	223	1926.....	284.2	133.0
1907.....	153	1917.....	224	1927.....	278.7	130.4
1908.....	129	1918.....	220			

^a Compiled from index for census years (1899, 1904, 1909, 1914, 1919, 1921, 1923, 1925), computed by Day and Thomas, with interpolations based, 1899-1919, on Day's (Harvard annual) index, and 1919-1925 on the Federal Reserve Board's index, and extrapolations, 1926 and 1927, based on the Federal Reserve Board's index with allowances for slight downward bias noted between 1919 and 1925.

^b Census years.

the decrease in home gardens in towns and cities, and the volume of farm products consumed by farmers' families are some of the items for which it is not easy to account. The index of agricultural production here used was adapted by Dr. E. Dana Durand, of the Department of Commerce, from indexes compiled by the Department of Agriculture.²⁷ It is probable that this series understates the growth of agricultural output over long periods of time.

Annual indexes of mining production are more comprehensive than those for any other branch of industry, owing partly to the adequate statistics furnished by the United States Bureau of Mines, partly to the fact that comparatively few products make up a dominant portion of the aggregate output of minerals, and finally to the relative simplicity of the products. The present index of mineral production was constructed by Dr. Durand. It covers 10 products—6 metals and 4 fuels—with an aggregate value in 1919 equivalent to nearly 95 per cent of the total value of all minerals produced in the United States.

Measures of railroad performance can be obtained from the elaborate statistics published by the Interstate Commerce Commission. The index of railroad performance used here is an average of relatives for passenger-miles and freight-ton miles, weighted on the basis of the respective revenues received from these two types of traffic.²⁸

²⁷ The index from 1899 to 1920 was constructed by Mordecai Ezekiel, from statistics of physical production of crops, livestock, and animal products, and that from 1924 to 1926 by Louis H. Bean, from statistics of gross farm income, adjusted for price changes per group.

²⁸ This index was prepared by Dr. E. Dana Durand, of the Department of Commerce.

Employment.—For the manufacturing industries there are now available a great mass of current data on employment which, together with the material contained in the biennial censuses of manufactures, affords an adequate view of fluctuations in employment. For the period before 1914, the supply of information is not so plentiful, and conclusions regarding the earlier period are, consequently, less certain. The annual index of the number of persons engaged in manufacturing from 1899 to 1927 is shown in Table 20. This index, based on data for the census

TABLE 20.—NUMBER OF PERSONS ENGAGED IN MANUFACTURE, BY YEARS, 1899–1927^a
(In thousands)

Year	Wage earners	Salaried and other	Total	Index (1899 = 100)
1899 ^b	4,713	577	5,290	100.0
1900	4,968	612	5,580	105
1901	5,184	647	5,831	110
1902	5,554	683	6,237	118
1903	5,784	713	6,497	123
1904 ^b	5,468	746	6,214	117.5
1905	5,906	820	6,726	127
1906	6,251	894	7,145	135
1907	6,483	967	7,450	141
1908	5,714	1,000	6,714	127
1909 ^b	6,615	1,064	7,679	145.1
1910	6,807	1,079	7,886	149
1911	6,855	1,095	7,950	150
1912	7,167	1,109	8,276	156
1913	7,277	1,123	8,400	159
1914 ^b	7,036	1,127	8,163	154.3
1915	7,200	1,270	8,470	160
1916	8,550	1,410	9,960	187
1917	9,220	1,550	10,770	204
1918	9,420	1,700	11,120	210
1919 ^b	9,096	1,717	10,813	.....
1919 ^c	8,990	1,679	10,669	204.4
1920	9,080	1,620	10,700	205.0
1921 ^b	6,938	1,313	8,251	158.2
1922	7,630	1,400	9,030	172.9
1923 ^b	8,768	1,499	10,267	196.7
1924	8,120	1,480	9,600	184.0
1925 ^b	8,384	1,474	9,858	188.9
1926	8,500	1,475	9,975	191.1
1927	8,260	1,470	9,730	186.4

^a Census year figures, with interpolations based on annual indexes of employment, compiled 1899–1914 by Professors Cobb and Douglas, 1914–1919 by Woodlief Thomas, and 1919–1925 by Federal Reserve Board, and extrapolations, 1926 and 1927, on basis of Bureau of Labor Statistics index, with allowance for downward bias.

^b Census years.

^c One set of figures includes data from establishments with product valued at over \$500, and the other from only those establishments with products of over \$5,000. Index numbers are computed from comparable figures.

years 1899, 1904, 1909, 1914, 1919, 1921, 1923, and 1925, was constructed for the period 1899 to 1914 by Cobb and Douglas.²⁹ The index from 1914 to 1919 was prepared by Woodlief Thomas from data collected by the United States Bureau of Labor Statistics and the New York State Department of Labor. From 1919 on, the index of the Federal Reserve Board was used.³⁰

The statistics of the number of workers in railroad transportation were taken from the reports of the Interstate Commerce Commission and represent total employees of railroads in the United States. In some years estimates were made on the basis of reports for Class I roads.

In agriculture and in mining, no such long and continuous series of employment data are to be had. Actual counts of the number employed can be obtained only for the census dates and these are less frequent than for manufacturing industry. For agriculture and mining, therefore, the use of the employment data are more valid in long than in short-time comparisons.

Per Capita Output.—Per capita output for each of the four main divisions of industry, and for all combined, is shown in Table 21 for the periods indicated.³¹ From 1899 to 1925 the physical volume of production of farms, factories, mines, and railroads in the United States increased by 136 per cent while, population grew by slightly over 50 per cent. Thus production per capita of population is now nearly 60 per cent greater than it was in the final years of the nineteenth century. The volume of output for each worker engaged directly in production has, during the same period, increased by 76 per cent. The increase was not an even one over the whole of the period, since output per worker increased 18 per cent in both the first and second decades, and 27 per cent in the six years from 1919 to 1925.

The greatest rise over the whole period was in the per capita production of minerals, which increased 99 per cent. This rise reflects chiefly the rapid increase in petroleum output. The process of producing petroleum requires a relatively small supply of labor, and the value of output per person is greater than that for any other mineral product. The rapid growth in petroleum production, consequently, has added proportionately more to the total output of minerals than it has to the

²⁹ *Op. cit.*, p. 147.

³⁰ For the method of constructing this index, see Federal Reserve *Bulletins*, December, 1923, and May, 1925. Since 1923 the Board's index has been made from practically the same data as that of the Bureau of Labor Statistics and the fluctuations of the two indexes are in substantial agreement.

³¹ Production in agriculture and in mining fluctuates wildly from year to year, in the former because of the weather and in the latter largely on account of strikes. To level out these wide fluctuations and to make the statistics of all four groups comparable, the statistics are presented in the table in the form of three-year averages.

TABLE 21.—INCREASE IN PRODUCTIVITY OF MAJOR BRANCHES OF INDUSTRY

Period and branch	Number of workers (thousands)		Index for end of period (beginning = 100)			Weight value at begin- ning (millions of dol- lars)	Weighted index (end)
	Begin- ning of period	End of period	Workers	Output ^a	Output ^b per worker		
1898-1900 to 1908-1910:							
Agriculture.....	10,700	11,400	106.5	113	106	3,500	3,955
Mining.....	600	1,010	168.5	190	112.5	600	1,140
Manufactures.....	5,300	7,430	140	150	107	4,830	7,240
Railways.....	970	1,575	162.5	185	114	1,300	2,405
Total or average.....	17,570	21,415	122	144	118	10,230	14,740
1908-1910 to 1918-1920:							
Agriculture.....	11,400	11,300	99	119	120	6,100	7,259
Mining.....	1,010	1,050	104	145	140	1,240	1,798
Manufactures.....	7,430	10,930	147	145.5	99	8,530	12,410
Railways.....	1,575	2,035	129	162	125.5	2,390	3,872
Total or average.....	21,415	25,315	118	139	117.5	18,260	25,339
1918-1920 to 1924-1926:							
Agriculture.....	11,300	10,700	95	114	120	15,700	17,898
Mining.....	1,050	1,050	100	127	127	3,175	4,032
Manufactures.....	10,780	9,810	92.5	122.5	134.5	24,750	30,320
Railways.....	2,035	1,860	91.5	100	109	5,040	5,040
Total or average.....	25,165	23,420	93	118	127	48,665	57,290
1898-1900 to 1924-1926:							
Agriculture ^a	10,700	10,700	100	153	153	3,500	5,355
Mining.....	600	1,050	175	348	199	600	2,088
Manufactures.....	5,300	9,950	189	268	142.5	4,830	12,940
Railways.....	970	1,860	192	299	156	1,300	3,887
Total or average.....	17,570	23,560	134.5	236	176	10,230	24,270
Mining, excluding petroleum...	576	858	150	244	163	.....	.....
Petroleum.....	24	192	800	1,268	158	.....	.....

^a Averages for all branches computed by weighting component indexes according to the relative importance of the several branches in 1899, as determined by value of product, given in next to last column of table.

^b Averages for all branches computed by dividing the average index of increase in output by the actual ratio of total workers at end of each period to total at beginning. The figure exceeds the weighted average of the indexes of output per worker in the several branches, because the largest increases in number of workers occurred in those branches in which average value of output per worker was relatively larger.

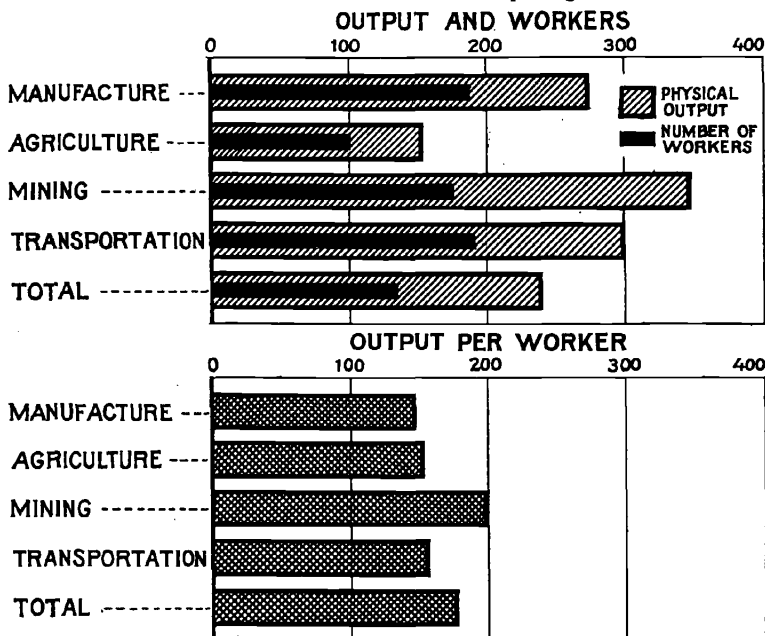
^c The differences in the figures given for number of persons employed in manufactures for 1919 and 1925 are due to changes in the size of establishments covered, and to certain exclusions of industries formerly reported. The 1925 figure, for comparison with 1899, was estimated from the percentages of change from census to census.

number of persons engaged in mineral production, and thus accounts for the rapid increase in the per capita production of minerals.

The general trend of agricultural production during the century has shown practically the same rate of growth as population and has not varied widely from this rate for any long period of time. The number of

CHART 1.—GROWTH IN PRODUCTION PER WORKER, 1899-1925

Index numbers for 1925 with 1899 equaling 100



farm workers increased slightly in the first decade of the century, but has subsequently decreased by about the same amount. The productivity of agricultural workers had its smallest growth in the decade from 1899 to 1909 and its largest in the postwar years.

Over the whole period, railroad traffic volume per worker increased 56 per cent, a rise slightly in excess of the increase in agriculture and manufacturing. Both the number of workers and the volume of traffic increased very rapidly during the first decade, while per capita output rose 14 per cent. In the second decade, traffic volume and number employed grew more slowly, but per capita output rose 25 per cent. From 1919 to 1925, there was a decrease in the number of employees and practically no change in traffic volume.

Productivity in Manufactures.—With regard to the postwar period in American economic history, beginning in 1919 and ending in 1925, the most striking changes in the productivity of labor took place in the category of manufacturing industry. In the first decade of the whole period, the increase in the per capita output of labor in both mining and railroads exceeded that of manufactures. The next decade witnessed an actual drop in manufacturing per capita output at the same time that there were notable advances in agriculture, mining, and rail transportation. But in the latest period the rise in manufacturing productivity was far in excess of that in the remaining three groups.

Much light can be thrown on the nature of the course of total and per capita output in manufacturing industries by an examination of the annual statistics given in Table 22. It is seen here that both production

TABLE 22.—PRODUCTIVITY OF MANUFACTURE, BY YEARS, 1899-1927
(Index numbers, 1899 = 100)

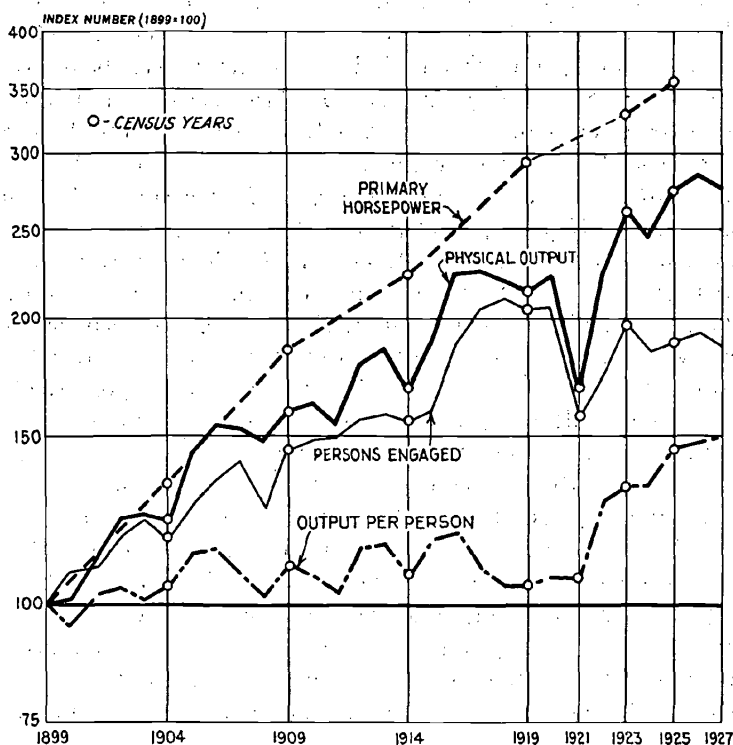
Year	Persons engaged	Volume of production	Output per person
1899 ^a	100	100	100
1900.....	105	101	96.2
1901.....	110	112	101.8
1902.....	118	122	103.4
1903.....	123	124	100.7
1904 ^a	117.5	122.2	104.0
1905.....	127	144	113.3
1906.....	135	154	114.0
1907.....	141	153	108.5
1908.....	127	129	101.5
1909 ^a	145.1	159.2	109.6
1910.....	149	162	108.7
1911.....	150	155	103.4
1912.....	156	179	114.6
1913.....	159	185	116.3
1914 ^a	156.2	169.4	108.5
1915.....	160	188	117.5
1916.....	187	223	119.2
1917.....	204	224	109.8
1918.....	210	220	104.7
1919 ^a	204.4	213.7	104.5
1920.....	205.0	221.4	107.9
1921 ^a	158.2	169.7	107.3
1922.....	172.9	222.2	128.5
1923 ^a	196.7	260.7	132.5
1924.....	184.0	244.7	133.0
1925 ^a	188.9	274.6	145.4
1926.....	191.1	284.2	148.7
1927.....	186.4	278.7	149.5

^a Census years.

and employment dropped in years of industrial recession—1904, 1908, 1911, and 1914—and reached new maximum levels in years of unusual activity—1903, 1906, 1907, 1909, 1913, and 1915. In 1915 both production and employment began to expand rapidly. Production reached its maximum in 1917, but remained at a high level until 1920. After 1916, however, employment began to increase more rapidly than production, and per capita output began to fall. From the peak of per capita output reached in 1916, productivity receded through 1917 and 1918, and reached its low in 1919, when per capita output was smaller than in any year of ordinary industrial activity since 1903. All of the rise since

1904 was lost in two years, 1918 and 1919. During 1920 and 1921 productivity rose, but only slightly.

CHART 2.—THE GROWTH OF MANUFACTURES, 1899-1927
Index number, 1899 = 100



The startling and unexpected change came in 1922. Total manufacturing output was then as large as in 1920, but employment was much smaller than in any year since 1915. Output per person then increased by 20 per cent. Not only was this the largest increase that had ever occurred in any single year, but it also brought the productivity of manufacturing to a level higher than any reached in the years preceding. In 1923 the rate of increase of productivity slackened and there was a rise of 3 per cent. In 1924, a year of recession, both total output and employment were reduced and there was no change in productivity. But 1925 was again an exceptional year, showing an increase in per capita output of 9 per cent. Thus the total increases in the four years since 1921 amounted to more than 35 per cent. Changes in 1926 and 1927 were slight.³²

³² In view of the probable error in the estimates for 1926 and 1927, since there are no census figures for any year after 1925, the changes recorded for these two years are too small to be significant.

A satisfactory interpretation of the unusual increases in productivity in 1922 and in 1925 should, of course, take into account the fact that they represented, in part at least, the recovery from a condition of abnormally low per capita output, and that the drop in productivity in 1917, 1918, and 1919, in a measure interrupted an upward trend. The figures indicate, however, that had the rate of increase of the period 1899 to 1916 continued, output per worker in 1922 would have been below the level actually achieved in that year. In 1916, the peak year in the period beginning 1899, per capita output was 19 per cent greater than in 1899. This rise took place over an interval of 17 years. From 1916 to 1925, a period of nine years, productivity increased 22 per cent. The increase, likewise, for the 16-year period from 1909 to 1925, was 33 per cent, as compared with 10 per cent from 1899 to 1909. The average annual rate of increase for the later period is twice the annual increment during the first decade. Again, by regarding 1922 as a year of recovery, and by comparing the increase in output in 1922 over the year preceding with increases in other years of recovery, it is found that the year 1922 stands by itself. Thus, after depression years there were increases in productivity of 9 per cent in 1905, 8 per cent in 1909, 11 per cent in 1912, and 9 per cent in 1915; whereas the rise in 1922 was 20 per cent.

Productivity by Industries.—Much that is obscure in accounting for the variations in total and per capita output may be clarified by inspection of the course of production in some of the branches of the general category of manufacturing industry. It has already been seen how breaking up the mineral group into its parts revealed the important rôle played in the growth of mining as a whole by the development of the petroleum industry. Similar data for the analysis of manufactures are presented in Table 23.

This table gives indexes of production, persons engaged, horse power installed, and output per person, for census years by major groups of manufacturing industry. The group indexes are not computed from the total figures reported by the census for these groups, but for selected industries in each group. The industries selected are those for which statistics of physical volume of product are available. About 50 per cent of all industries, measured either by number of persons engaged or by value added by manufacture, are included in the index, but among the several groups this proportion varies from 20 per cent for paper and printing to practically 100 per cent for tobacco products.³³ In a few cases the index is not typical of the entire group, but the data on physical volume of production, persons engaged, and horse power cover the same industries and are, consequently, comparable with one another. In general, the indexes for the tobacco, textile, vehicles, nonferrous metals,

³³ These percentages for each group, together with other information regarding the representativeness of the index, are given in Day and Thomas, *op. cit.*, Appendix A.

TABLE 23.—PRODUCTIVITY OF MANUFACTURE, BY INDUSTRIAL GROUPS IN CENSUS YEARS, 1899-1925

	Index numbers: Base, 1919								Per cent of increase, 1899-1925
	1925	1923	1921	1919	1914	1909	1904	1899	
All industries:									
Physical volume of production.....	128.5	122.0	79.4	100.0	79.3	74.5	57.2	46.8	174.6
Number of persons engaged.....	92.4	96.2	77.3	100.0	76.4	71.0	57.5	48.9	89.0
Primary horse power.....	121.8	112.8	100.0	100.0	76.0	63.3	45.7	34.2	256.1
Output per person engaged.....	139.1	126.8	102.7	100.0	103.8	104.9	99.5	95.7	45.3
INDUSTRIAL GROUPS									
Iron and steel:									
Physical volume of production.....	131.5	131.2	56.6	100.0	71.1	75.3	51.8	43.2	204.4
Number of persons engaged.....	95.6	102.1	65.5	100.0	68.2	58.3	46.3	38.9	145.8
Primary horse power.....	114.1	110.3	100.0	100.0	71.1	59.1	43.0	28.0	307.5
Output per person engaged.....	137.6	128.5	86.4	100.0	104.3	129.2	111.9	111.1	23.9
Nonferrous metals:									
Physical volume of production.....	129.8	125.7	66.5	100.0	64.9	60.6	44.5	31.4	313.4
Number of persons engaged.....	81.2	91.2	53.6	100.0	66.4	61.2	51.6	43.3	87.5
Primary horse power.....	114.0	117.5	100.0	100.0	53.8	44.1	28.3	19.8	475.8
Output per person engaged.....	159.9	137.8	124.1	100.0	97.7	99.0	86.2	72.5	120.6
Chemicals and allied products:									
Physical volume of production.....	140.6	125.1	94.5	100.0	70.7	58.8	42.9	30.2	365.6
Number of persons engaged.....	91.8	95.7	77.6	100.0	70.3	60.5	49.5	42.3	117.0
Primary horse power.....	147.1	134.8	100.0	100.0	72.6	49.6	35.0	21.9	571.7
Output per person engaged.....	153.2	130.7	121.8	100.0	100.6	97.2	86.7	71.4	114.6
Stone, clay, and glass products:									
Physical volume of production.....	179.1	155.6	93.3	100.0	113.5	104.3	78.9	67.3	166.1
Number of persons engaged.....	115.1	115.7	84.1	100.0	110.4	95.4	81.8	68.4	68.3
Primary horse power.....	151.5	124.7	100.0	100.0	98.4	74.9	44.6	28.0	441.1
Output per person engaged.....	155.6	134.5	110.9	100.0	102.8	109.3	96.5	98.4	58.1
Lumber:									
Physical volume of production.....	113.6	110.1	79.9	100.0	110.6	137.3	104.0	106.4	6.8
Number of persons engaged.....	94.1	98.9	73.9	100.0	99.5	113.9	83.0	87.4	7.7
Primary horse power.....	86.9	81.9	100.0	100.0	92.9	98.2	63.2	58.3	49.1
Output per person engaged.....	120.7	111.3	108.1	100.0	111.2	120.5	125.3	121.7	-0.8
Paper and printing:									
Physical volume of production.....	152.8	137.1	93.4	100.0	87.5	69.8	51.9	36.6	317.5
Number of persons engaged.....	108.8	106.5	92.4	100.0	76.5	65.2	56.1	42.4	156.6
Primary horse power.....	131.1	117.7	100.0	100.0	87.6	70.5	59.1	41.2	218.2
Output per person engaged.....	140.4	128.7	101.1	100.0	114.4	107.1	92.5	86.3	62.7
Textiles:									
Physical volume of production.....	119.3	122.9	96.8	100.0	96.8	91.9	71.9	60.7	96.5
Number of persons engaged.....	104.5	111.1	95.0	100.0	89.3	85.2	71.7	63.9	63.5
Primary horse power.....	126.6	116.7	100.0	100.0	83.7	70.0	53.9	43.6	190.4
Output per person engaged.....	114.2	110.6	101.9	100.0	108.4	107.9	100.3	95.0	20.2
Leather and its remanufactures:									
Physical volume of production.....	93.4	105.6	85.2	100.0	87.4	87.7	81.5	69.8	33.8
Number of persons engaged.....	90.6	99.8	81.8	100.0	85.7	84.7	70.1	65.4	38.5
Primary horse power.....	106.9	105.9	100.0	100.0	80.5	69.1	51.2	40.8	162.0
Output per person engaged.....	103.1	105.8	104.2	100.0	102.0	103.5	116.3	106.7	-3.4
Food and kindred products:									
Physical volume of production.....	116.4	111.6	93.5	100.0	80.8	74.8	65.1	53.0	119.6
Number of persons engaged.....	81.3	83.5	76.1	100.0	71.1	62.7	53.8	49.2	65.2
Primary horse power.....	115.8	107.6	100.0	100.0	81.5	70.4	60.7	49.1	135.8
Output per person engaged.....	143.2	133.7	122.9	100.0	113.6	119.3	121.0	107.7	33.0
Tobacco manufactures:									
Physical volume of production.....	124.4	109.8	95.3	100.0	76.4	66.6	57.8	46.3	168.7
Number of persons engaged.....	79.9	91.2	93.4	100.0	116.3	108.9	103.4	86.6	-7.7
Primary horse power.....	97.0	100.3	100.0	100.0	80.5	65.7	56.7	51.4	88.7
Output per person engaged.....	155.7	120.4	102.0	100.0	65.7	61.2	55.9	53.5	191.0
Rubber products:									
Physical volume of production.....	158.8	130.8	80.0	100.0	32.3	21.0	.....	.....	.....
Number of persons engaged.....	79.7	80.5	62.7	100.0	41.5	25.2	21.9	18.7	326.2
Primary horse power.....	152.8	140.9	100.0	100.0	46.4	28.5	20.2	16.6	820.5
Output per person engaged.....	199.2	162.5	127.6	100.0	77.8	83.3	.....	.....	.....
Vehicles for land transportation:									
Physical volume of production.....	238.3	199.5	76.8	100.0	36.0	15.6	8.2	4.4	5,315.9
Number of persons engaged.....	108.3	114.8	65.2	100.0	54.9	42.5	29.9	25.4	326.4
Primary horse power.....	182.5	148.9	100.0	100.0	51.2	35.6	19.5	13.4	1,261.9
Output per person engaged.....	220.0	173.8	117.8	100.0	65.6	36.7	27.4	17.3	1,171.7
Ship building:									
Physical volume of production.....	7.0	7.9	30.7	100.0	7.3	7.2	10.0	9.0	-22.2
Number of persons engaged.....	13.5	16.5	27.8	100.0	11.8	10.9	13.2	11.9	13.4
Primary horse power.....	54.8	57.4	100.0	100.0	20.8	15.9	14.1	11.2	389.3
Output per person engaged.....	51.9	47.9	110.4	100.0	61.9	66.1	75.8	75.6	-31.3

leather, chemicals, and stone, clay, and glass groups are more representative of their whole groups than the indexes for iron and steel, food products, lumber, and paper and printing.³⁴

In Table 24 changes in the productivity of these groups of industries during various periods of time are shown. No comparisons are made with the years 1904, 1914, and 1921 because they were years of industrial recession in which production per worker was temporarily reduced. From the beginning of the century to 1925, the greatest advances came in the automobile, tobacco, smelting and refining, and chemical industries.

TABLE 24.—CHANGES IN PRODUCTIVITY OF MANUFACTURE, BY INDUSTRIAL GROUPS, FOR SELECTED CENSUS PERIODS, 1899-1925
(Per cent of increase or decrease (-))

	1899 to 1925	1923 to 1925	1909 to 1925	1919 to 1925	1909 to 1919	1899 to 1909
All industries.....	45.3	9.7	32.6	39.1	- 4.7	9.6
Iron and steel.....	23.9	7.1	6.5	37.6	-22.6	16.3
Nonferrous metals.....	120.6	16.0	61.5	59.9	1.0	36.6
Chemicals and allied products.....	114.6	17.2	57.6	53.2	2.9	36.1
Stone, clay, and glass products.....	58.1	15.7	42.4	55.6	- 8.5	11.1
Lumber.....	-0.8	8.4	0.2	20.7	-17.0	-1.0
Paper and printing.....	62.7	9.1	31.1	40.4	- 6.6	24.1
Textiles.....	20.2	3.3	5.8	14.2	- 7.3	13.6
Leather and its remanufactures.....	-3.4	-2.6	- 0.4	3.1	- 3.4	-3.0
Food and kindred products.....	33.0	7.1	20.0	43.2	-16.2	10.8
Tobacco manufactures.....	191.0	29.3	154.4	55.7	63.4	14.4
Rubber products.....		22.6	139.1	99.2	20.0	.....
Vehicles for land transportation.....	1,171.7	26.6	499.5	120.0	172.5	112.1
Shipbuilding.....	-31.3	8.4	-21.5	-48.1	51.3	-12.6

If the changes from 1909 to 1925 and from 1923 to 1925 are examined, it is clear that rubber products should be included among the industries showing the most rapid rise in productivity. Out of these five industrial groups, then, three (automobiles, rubber products, and chemicals) are directly or indirectly associated with the automobile industry, since much of the growth of the chemical industry may be attributed to the development of the industry of petroleum refining. The striking increase in the tobacco group reflects the growth of cigarette production and the substitution in consumption of the machine-made cigarette for the hand-made cigar. The rise in the group of stone, clay, and glass products is, no doubt, associated with the great increase in building construction

³⁴ Representativeness is here tested by comparing the change, in census periods, in the number of wage earners employed in the industries included in the index with corresponding changes in the industries in the group not included in the index. This is not necessarily a conclusive test, particularly where increased elaboration of manufacture or improved technique has characterized the excluded industries, as, for instance, in the iron and steel group.

and consequently in the use of building materials. Thus, in the period from 1909 to 1919, both the total and per capita output of lumber and stone, glass, and clay products decreased because of Government restrictions on building during the war. But in the following years, 1919 to 1925, the per capita output of both increased.

The advance of nearly 40 per cent in productivity for all manufacturing from 1919 to 1925 was shared by all industries, except leather and shipbuilding. But the shipbuilding industry, which had grown to large proportions during the war, was, of course, violently reduced in size after the war. For the rest, the greatest growth was in those industries—nonferrous metals, chemicals, paper and printing, tobacco, rubber, and vehicles—which had been growing rapidly in all other periods. It is interesting to note that, in the period of general decline in per capita output from 1909 to 1919, productivity increased 63 per cent in tobacco manufactures, 20 per cent in rubber products, and 173 per cent in vehicles for land transportation. Again, from 1923 to 1925, when the per capita output for all manufactures advanced by 9.7 per cent, tobacco manufactures increased 29 per cent, rubber products 23, automobiles 27, and chemical and allied products 17 per cent.

The Period 1925 to 1927.—Until the statistics from the census of manufactures of 1927 are available, it would be unwise to place too much weight on the estimates of manufacturing production in those years and on the changes in per capita output by industry, recorded in Table 25. It appears from the figures in this table, which represent an approximation of the course of productivity after 1925, that the precipitate rate of advance, begun in 1922 and continued through 1925, has perceptibly slackened and in the latest two-year period was 4 per cent. This was due, in large measure, to the fact that total production declined toward the end of 1927 and was, for the whole of the year, only slightly greater than in 1925.

Most of the decrease in output occurred in automobiles, lumber, and iron and steel. The textile and leather industries were more active in 1927. The expansion in the production of cigarettes and of petroleum products continued. Employment declined in every group shown except shipbuilding, paper and printing, and petroleum refining. Output per worker rose for most of the groups, with the largest increases in the shipbuilding, tobacco, and petroleum industries. The altogether surprising drop of more than 12 per cent in per capita output in the automobile industry is unquestionably to be explained by the existence of an unusual condition in the industry. During most of the last half of 1927, the Ford plants were not producing automobiles. Although the number of employees was then reduced, many were retained in the manufacture of parts, which do not appear in the available records of production. The operations of many other automobile companies were also consider-

ably curtailed in the last part of the year and the marked recession in the activity of this industry had its customary depressive effect on productivity.

TABLE 25.—PRODUCTION AND EMPLOYMENT, BY INDUSTRIAL GROUPS
(Percentage of increase or decrease (—) 1925 to 1927)

	Production	Employment	Output per wage earner
Total manufacturing.....	^a 0.8	^a — 3.0	^a 4.0
Iron and steel—group.....	^b — 2.5	— 1.8	^b — 0.7
Iron and steel industry.....	— 2.5	— 5.1	2.6
Nonferrous metals.....	2.0	— 6.4	8.0
Petroleum refining.....	18.2	0.6	17.4
Stone, clay, and glass.....	— 0.4	— 3.6	3.3
Lumber—group.....	^b 11.2	—10.4	^b — 0.9
Lumber industry.....	—11.2	—12.1	0.9
Paper and printing.....	7.1	2.9	4.0
Paper and pulp.....	3.7	— 1.1	4.9
Textiles.....	^b 8.7	— 2.4	^b 11.5
Fabrics.....	8.7	— 1.1	10.0
Products.....	.....	— 4.6	.....
Leather.....	6.8	— 4.4	11.7
Food.....	— 1.5	— 1.8	0.3
Tobacco.....	12.8	— 8.7	28.5
Automobile tires and tubes.....	4.5	— 4.9	10.0
Automobiles.....	—19.6	— 7.9	—12.7
Shipbuilding.....	70.4	13.1	50.5

^a Without adjustment for bias shown in Table 23.

^b Comprehensive group indexes of production not available.

The Nature of the Data.—It has already been noted that the raw statistical materials used in measuring productivity possess inherent limitations and peculiarities which merit further consideration. In general, the indexes of productivity appear to be considerably affected by temporary factors, particularly by cyclical swings in production. When total output in industry is relatively large, output per worker is usually also large. While this concurrence is partly the result of full-time operation and the free flow of work, it is in larger measure due to the failure to allow for changes in the number of working hours.³⁵ The unit of employment is the individual worker whose name appears on the pay roll, regardless of the amount or nature of the work he does. As a result of this method of measuring productivity, the index of output per person tends to fluctuate with the index of production. In long-time comparisons the effect of temporary influences relative to the total change that has occurred may be small, but in short periods the temporary effects are probably dominant. Considerable evidence of this

³⁵ Investigations have been made by the United States Bureau of Labor Statistics of changes in the productivity of labor in specific industries, with allowances for changes in working hours. See *Monthly Labor Review*, January, 1927, pp. 35-49.

peculiarity of the method can be found in the variations in productivity for many industries over periods of only several years. Wherever there are measures of production per man-hour, the increase in productivity is almost invariably greater than the increase in productivity measured by the rise in output per man-year. This is universally the case in the United States, since the number of working hours for all American manufacturing industry has had a great decline in the past quarter-century.

Inherent in the preceding measures of productivity are evidences of the changing structure of industry which, on the one hand, account for the increases in productivity in the past and, on the other, forecast like advances in the future. For those industries in which total output and output per worker have grown most rapidly in the past decades, such as motor vehicles, petroleum refining, rubber tires, cigarettes, cement, chemicals, electrical machinery, printing and publishing, butter, cheese, condensed milk, and manufactured ice, the actual value added to output for each worker by the processes of manufacture is greater than in those industries that have expanded more slowly. Expansion in output in these types of industries, therefore, requires a relatively smaller addition to the total number of workers than in the others. If, at the same time, the first group of industries, or others like them, become relatively more important in the total industry of the country, their influence on raising the productivity of all industry becomes correspondingly greater. This, in substance, what has happened. Measured by value of product, the motor vehicles industry was the most important of all manufacturing industries in 1925; in 1919 it was third; and in 1909, twenty-second. In 1909 petroleum refining ranked twenty-fourth in the list of manufacturing industries; in 1919 it ranked seventh, and in 1925 fourth. Similar striking changes have taken place in the position of the rubber tire, electrical machinery and supply, canning and preserving, chemical, and cement industries.

The Causes of Changing Productivity.—Aside from factors such as have been just discussed, whose effects are clear and determining, there remain many circumstances that influence the course of total and per capita production. The prevailing systems of wage payment, the relations between management and employed, the state of the industrial arts, and the cost of investment funds are only a few of the many factors that deserve to be studied and weighed. But they are hard to disentangle and, when separated, to measure. Even such an apparently simple concept as the mechanization of industry does not yet lend itself to satisfactory statistical analysis. According to the census of manufactures, for example, the amount of primary horse power installed in factories showed a relatively smaller increase between 1919 and 1925 than in any previous census period, and the expansion from 1923 to 1925 was not unusual. The record of machinery production for the same

periods, likewise, fails to show any noteworthy increase. In fact, decreases were common in some lines, although the manufacture of electrical machinery, apparatus, and supplies did increase. None of these figures, however, indicates changes in the degree of utilization of either machines or existing power equipment. With this as with other central economic problems, the supply of the available statistical materials must be progressively increased; but at the same time, the statistical analysis needs to be supplemented by detailed field examinations of the processes of industry.³⁶

IV. EMPLOYMENT AND UNEMPLOYMENT

The extent of fluctuation in what are generally called employment and unemployment depends often on the definition of these terms. If employment be defined as the number of people attached to an industry, or the number seeking a livelihood in an industry, the movement in employment may vary markedly from the employment that registers changes in the number of people actually on the pay rolls of an industry. This latter figure, in turn, may, and often does, differ substantially from employment, expressed in terms of the number of man-hours worked by those on the pay roll. Comprehensive data for the comparison of three such series are not available, but it is known from the observation of samples that their range of fluctuation is unequal and that they move generally, but not necessarily always, in the same direction.

Obviously, each of these three series may be put to different uses. Attempts have been made to estimate unemployment from changes in the number on pay rolls. In the section on productivity, the average number employed each year was used in estimating per capita output. For more elaborate estimates of unemployment, it is sometimes the practice to compare the numbers attached to an industry with the numbers on pay rolls. Most frequently, however, monthly statistics of the numbers on pay rolls have been used as measures of the stability of employment, and monthly statistics of the total wages paid to those on pay rolls as measures of the stability of the purchasing power of wage earners. It is in this last sense that the statistics of employment and income are used in this section.³⁷

Employment since 1919.³⁸—Discussion of the monthly fluctuations of employment and pay roll must be confined to factory and railroad

³⁶ For an example of this type of inquiry, see forthcoming study by Harry Jerome on the mechanization of industry in the series of the National Bureau of Economic Research.

³⁷ For more comprehensive discussions of the employment data, see W. A. Berridge, "What the Present Statistics of Employment Show," in *Business Cycles and Unemployment*, 1923, Chap. IV; R. G. Hurlin and W. A. Berridge, *Employment Statistics for the United States*, Russell Sage Foundation, 1926.

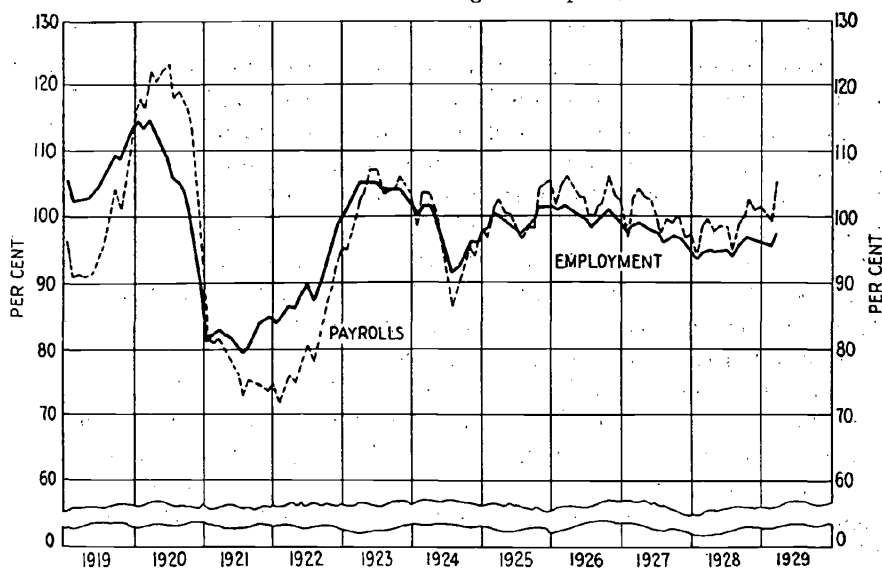
³⁸ The material for this section on employment was prepared by W. A. Berridge, of the Metropolitan Life Insurance Co.

employees. In the other important branches of industry, mining and quarrying and building construction, in retail and wholesale trade, in the group of personal services, and in agriculture there are at present no adequate data for the study of employment and income. While this is a serious gap, the railroad and particularly the manufacturing data are important enough to be valuable in themselves.

The great instability in both the employment and income of factory workers from 1920 to 1922 is shown in Chart 3.³⁹ Income dropped from its high in March, 1920, to its low in January, 1922, by 42 per cent, while employment declined from a high in March, 1920 to a low in July, 1921, by 31 per cent, the variations in the two series being due, of course, to a

CHART 3.—FACTORY EMPLOYMENT AND PAY ROLLS

Base: 1923-1925 average = 100 per cent



drop in wages during the period and to the further reduction in income from short time, not revealed in the employment index. Thereafter, both curves move within a much narrower range. Employment drops 14 per cent from the high in May and June, 1923, to the low in July, 1924; and again approximately 8 per cent from March, 1926 to January, 1928.

Comparisons of the prewar and postwar course of employment in manufacturing industries are impaired by changes in the character of the underlying data over a long period of time. The rough comparisons in Table 26, however, would appear to show no startling differences

³⁹ Both series charted here have been adjusted to all four censuses (1919, 1921, 1923, and 1925) by Woodlief Thomas. For individual industries, Mr. Thomas has thus far worked out such adjustments only through the Census of 1923.

between the normal stability of employment before the war and the condition after the collapse in 1920.⁴⁰

TABLE 26.—COURSE OF EMPLOYMENT IN MANUFACTURING INDUSTRIES

Peak of boom	Bottom of depression	Approximate decline of employment
		<i>Per cent</i>
Middle of 1903.....	Middle of 1904.....	5
Middle of 1907.....	First quarter, 1908.....	15
Early 1910.....	Middle of 1911.....	5
Early 1913.....	Late 1914 and early 1915.....	10
Third quarter, 1918.....	Second quarter, 1919.....	15
March, 1920.....	July, 1921.....	30
May and June, 1923.....	July, 1924.....	13
March, 1926.....	January, 1928.....	8

Measures of labor turnover⁴¹ in manufacturing industries, available for the period since 1919 but not before the war, confirm the impression of stability shown by the indexes of employment and income. Since 1921, and particularly since 1923, both the accession or hiring rates and the lay-off rates, corrected for differences in the length of the month, have fluctuated much less violently than in the first part of the postwar period. In the 1919–20 boom, accession rates rose in some months as high as 220 per cent; while the average⁴² lay-off rate was at or near zero. In the following severe depression, accessions fell to about 15 per cent, and lay-offs rose to a peak of 50 per cent.

In the strong revival of industry in 1922–23, accession rates rose, but this time only to about 155 per cent, lay-offs falling meanwhile to about 1 per cent. The depression of 1924, and the ups and downs since then, have at no time forced accession rates below 25 or above 85 per cent; lay-off rates in these five years have been confined within the range of 3 to 12 per cent.

Monthly statistics of railroad employment and wages paid were not available until July, 1921. The great decline in employment and pay rolls of manufacturing industries between 1920 and 1922 was matched in the experience of the railroads. During the busiest quarter of 1920, the monthly income of railroad workers was \$350,000,000. This fell to the rate of \$190,000,000 per month in the early part of 1922. Since

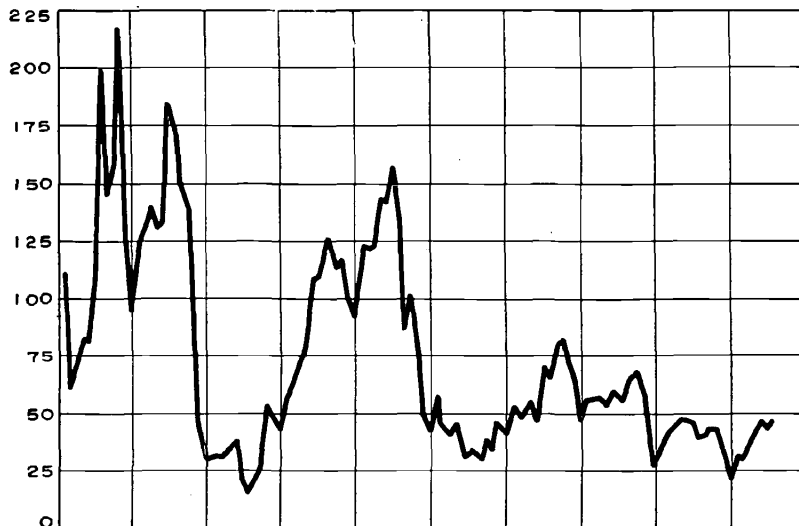
⁴⁰ See Berridge, *op. cit.*, p. 59.

⁴¹ Published by the Policyholders' Service Bureau of the Metropolitan Life Insurance Co. The canvass is not limited to group policyholders. Although the figures cover no more than 10 per cent of the factory workers of the country, they are obtained from a wide variety of factory industries and are regarded as a sound sample. For a description of the measures, see W. A. Berridge, "A New Set of Labor Turnover Indexes," *Personnel Journal*, Vol. VI, No. 1, June, 1927.

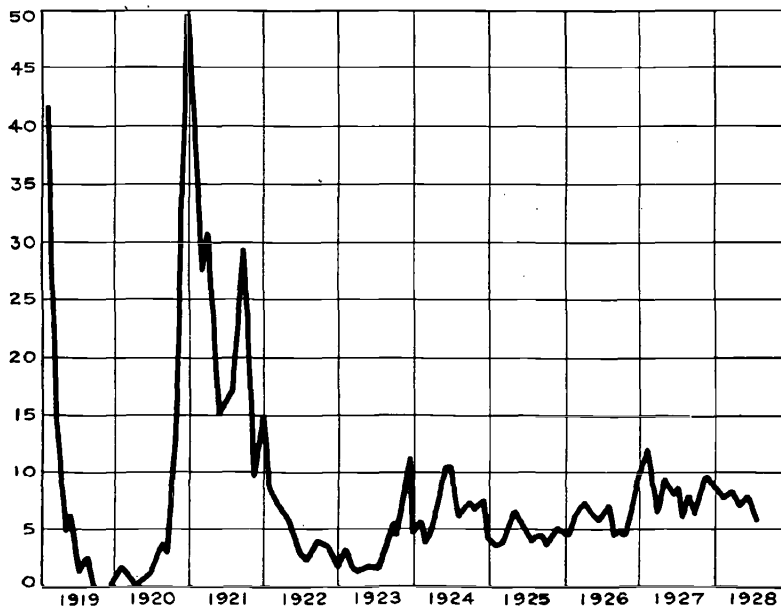
⁴² The form of average used in constructing these indexes is the median.

CHART 4.—HIRING AND LAY-OFF RATES, 1919-1928

HIRING RATE (EQUIVALENT ANNUAL BASIS)



LAY-OFF RATE (EQUIVALENT ANNUAL BASIS)



early 1922, these money incomes have fluctuated within the range from \$220,000,000 to \$270,000,000 per month, being for three-fourths of this last period within a range one-half as great.

An interesting measure of the stability of employment is one derived from statistics published monthly⁴³ since 1920 by the National Industrial

⁴³ For the last seven months of 1920 and for the last six months of 1922.

Conference Board. This presents for more than twenty representative manufacturing industries the average per capita full-time hours per week and the average per capita hours actually worked. Comparison between these two figures should yield a useful measure of what may be described as unemployment within employment. Such measures were computed by taking the percentages that the number of hours lost are of the nominal hours per week. Where these percentages are positive, the actual work-week fell short of the nominal; where negative, the actual work-week exceeded the nominal, probably due to overtime. The average percentages for all of the manufacturing industries included in these computations are, of course, always positive, but individual industries occasionally show a negative percentage. The averages for all industries and for those showing the best and worst employment are given in Table 27.

TABLE 27.—PER CENT HOURS LOST ARE OF NOMINAL HOURS PER WEEK

Year	Best industry	Worst industry	Average all industries
1920.....	-0.8 (paper and pulp).	12.9 (woolens and silk).	5.7
1921.....	2.7 (meat packing).	18.4 (agricultural implements).	10.4
1922.....	-2.5 (chemicals).	16.6 (fertilizers).	3.6
1923.....	-2.1 (chemicals).	11.0 (fertilizers).	3.3
1924.....	-1.6 (meat packing).	15.6 (cotton, North).	6.6
1925.....	-2.9 (chemicals).	11.6 (hosiery and knit goods).	4.8
1926.....	-5.0 (paper and pulp).	11.6 (hosiery and knit goods).	5.2
1927.....	-3.6 (paper and pulp).	9.6 (hosiery and knit goods).	5.1

The averages for all industries unquestionably give the impression of greater stability than was to have been expected, and confirm in a measure the findings of an earlier investigation by W. I. King, covering the period from 1920 to 1922.⁴⁴ In both 1920 and 1922, however, the averages for the year might have been modified if the statistics for all 12 months had been available.

Unemployment.⁴⁵ Estimates of the volume of unemployment will vary, as we have often seen in this country, with the method of measurement used and with the definition of unemployment.⁴⁶

⁴⁴ "Changes in Employment in the Principal Industrial Fields," in *Business Cycles and Unemployment*, 1923, p. 95.

⁴⁵ All of the material in this section was prepared by Meredith B. Givens, of the Social Science Research Council, and of the National Bureau of Economic Research, formerly of the United States Bureau of Labor Statistics.

⁴⁶ For this reason, some general machinery for registering the unemployed is likely to yield the most satisfactory statistics of unemployment; first, because such an agency of registration can make use of a definition of unemployment that is simple and universally understood, and second, because registration, if compulsory, catches the great bulk of the unemployed. These are, indeed, the characteristics of the

In the United States, where there is virtually no adequate, continuous registration of the unemployed, measures of unemployment have been derived in one way or another from the statistics of employment. Where this procedure has been used, it may be said to measure not unemployment, but the shrinkage in employment. Under limited ideal conditions, the two may amount to the same thing, but under the conditions of measurement prevailing in this country, as will be seen later, they are usually not the same thing; they may, indeed, be very far apart. The possible divergencies can be best seen by examining recent estimates of the volume of unemployment in the United States for either the year 1927 or for early 1928.

An estimate by the United States Bureau of Labor Statistics places the numbers laid off the pay roll by early 1928 at 1,874,500.⁴⁷ This number is described as "a shrinkage between the average of 1925 and January, 1928." It was assumed in making this estimate that there was no "noticeable unemployment question" in 1925. The estimated shrinkage, moreover, was derived from the known reduction in railroad employment, taken from the reports of the Interstate Commerce Commission and from the drop in manufacturing employment reflected in the monthly employment statistics compiled by the Bureau.

TABLE 28.—UNEMPLOYMENT ESTIMATED BY LABOR BUREAU, INC.

	Plus	Minus
Estimated number unemployed in 1923.....	1,000,000	
Estimated increase in supply of employable persons through population growth.....	3,000,000	
Estimated number of farm workers moved to town.....	1,000,000	
Estimated possible increases of employment in certain lines.....		2,100,000
Professions.....	200,000	
Amusements.....	100,000	
Public utilities.....	200,000	
Automobile sales and service.....	750,000	
Other distribution.....	500,000	
Building.....	300,000	
Miscellaneous.....	100,000	
Estimated declines in employment.....	1,200,000	
Manufactures.....	1,000,000	
Railways.....	100,000	
Coal mining.....	100,000	
Net unemployment, 1927.....	4,000,000	

statistics of unemployment wherever there is an inclusive machinery of registration, either as a part of the system of unemployment insurance or in the form of a comprehensive chain of public employment bureaus. Even such estimates of unemployment may be defective in not indicating the volume of short time or in omitting important occupations whose employment experience is not recorded, but in spite of their shortcomings they are generally superior to measures of unemployment that rest on no registration basis whatsoever.

⁴⁷ United States Sen. Doc., No. 77, 70th Cong., 1st sess., pp. 3, 5.

A second estimate, by the Labor Bureau, Inc., rests not only on shrinkage in employment but involves measures of increases in employment in expanding industries and in the total number of persons available for work. The various steps in this estimate are shown in Table 28.

The Brookmire Economic Service, following a still different method, has estimated the number unemployed each year from 1910 to 1928. These estimates are shown in Table 29. They represent the difference in each year between actual employment and probable maximum employment. Five years during this period, 1912, 1917, 1920, 1923, and 1926, have been regarded as years of exceptionally high business activity and, therefore, of full employment. In such years, there is assumed to be no unemployment.

TABLE 29.—UNEMPLOYMENT SHOWN AS THE DIFFERENCE BETWEEN PROBABLE MAXIMUM EMPLOYMENT AND ACTUAL EMPLOYMENT
(In thousands)

Year	United States population	Full employment ^a		Actual ^b employment	Un-employed ^c
		Per cent	Number		
1910 ^d	92,267	41.5	38,167	38,167	.....
1911.....	93,628	41.5	38,856	38,360	496
1912 ^d	95,097	41.5	39,445	39,445	.....
1913.....	96,512	41.6	40,149	39,882	267
1914.....	97,928	41.7	40,875	38,848	2,027
1915.....	99,343	41.9	41,585	40,106	1,479
1916.....	100,758	42.0	42,318	42,206	112
1917 ^d	102,173	42.1	43,016	43,016	.....
1918.....	103,588	41.5	42,989	42,931	58
1919.....	105,003	40.8	42,841	42,766	75
1920 ^d	106,422	40.2	42,809	42,809	.....
1921.....	108,445	39.8	43,161	39,508	3,653
1922.....	109,893	39.3	43,189	40,622	2,567
1923 ^d	111,693	38.8	43,284	43,284	.....
1924.....	113,727	38.0	43,216	41,826	1,390
1925.....	115,378	37.1	42,805	42,418	387
1926 ^d	117,136	36.2	42,433	42,433	.....
1927.....	118,628	36.2	42,943	41,477	1,466
1928 (March).....	120,013	36.2	43,445	40,813	2,632

^a The percentage of total population employed was computed for the years of full employment, and percentages for intervening years interpolated on a straight line and used in computing full employment for those years.

^b Actual employment, for each year, was computed by the Brookmire staff from official data taken from the following sources: Census; Department of Agriculture; Department of Labor; Interstate Commerce Commission; Bureau of Mines; and the Federal Reserve Board; also National Industrial Conference Board, Russell Sage Foundation, New York Times Annalist, and Paul Douglas in the *American Economic Review*.

^c Unemployment, as shown, is the difference between probable maximum employment and actual employment. It does not allow for numbers idle, even during years of exceptionally high business activity.

^d Assumed to be years of full employment owing to the high level of business as shown by the Brookmire Business Index.

Lewis Corey,⁴⁸ finally, estimates total unemployment in 1927 at 3,500,000. His estimates rest on the assumption that a surplus of industrial workers was created during the period from 1919 to 1926 as the result of technological improvements in industry.⁴⁹ The size of this surplus is determined by the estimates of the number of gainfully occupied persons reported by the National Bureau of Economic Research, by the reduction in farm employment, and by the decline in the average number of persons employed in manufacturing, mining, and transportation, as shown by the current indexes. The depression of 1927 is estimated to be responsible for a further reduction in employment of 1,000,000 persons. To the aggregate so obtained are further added an estimated permanent labor reserve of 750,000.

No check of the underlying data in the elaborate estimates of Corey, the Labor Bureau, and the Brookmire Service is possible because the details of the methods and assumptions used are not available. In the first two of these estimates it is clear that much of the basic material is in the form of round numbers and that more refined methods might materially modify the totals. They both also neglect or underestimate the extent of diversion of employment and such an item as the increase in school attendance. The Brookmire assumption that there are years of no unemployment is one rarely held. Finally, the method employed by the United States Bureau of Labor Statistics is too obviously limited to constitute an acceptable measure of unemployment.

A New Estimate of Unemployment.—This latest estimate is based on the definition of the volume of unemployment as the difference between the number of persons actually employed and the number desiring and habitually dependent upon employment. In making this measure, accordingly, the average number of persons actually employed annually in the United States has been determined by aggregating the number so employed in the various occupational and industrial groups composing the total. This average annual employment has been compared to the estimated total number of persons dependent upon employment, or "attached" to industry; and the difference between the two sets of figures has been defined as the estimated average annual unemployment. Such estimates were made for each year, beginning in 1920 and ending in 1927.

The resultant measures of the volume of unemployment are probably minimum estimates. Actual unemployment during any year has doubtless exceeded the figure shown. The material on which this and other estimates of unemployment rest is not all of the same quality and a large

⁴⁸ Lewis Corey, "An Estimate of Unemployment: Cyclical Idleness Added to Technological," *The Annalist*, March 9, 1928.

⁴⁹ See Technological Unemployment, Chap. II, Industry, Part 1, p. 92; Chap. V, Marketing, p. 328; Chap. VII, Management, p. 514.

amount of inference and estimate is unavoidable. Only additional information to be collected in the future, such as a comprehensive census of distribution, can uncover the errors hidden in the material now available. With the information we now have, the present estimates may be held to throw light on the direction and structure of total employment and unemployment since the war, and no more. They could hardly serve as the actuarial basis for the fixing of unemployment insurance premiums.

The basic figures of the numbers gainfully employed in agriculture, industry, trade, service, and the professions, and in their major subdivisions are taken from the elaborate estimates made by W. I. King in connection with the inquiries of the National Bureau of Economic Research into the national income. Substantially, King's estimates of the numbers attached to industry are made by discovering in each year the highest month of employment and by inflating this figure by an arbitrary percentage to allow for illness and other known factors.

In the present study, those forces that are believed to have affected the structure of the working population of the country since 1920 have been examined, and King's estimates have been slightly revised in several particulars to allow for certain changes. The total school population of the country has, for example, increased by 4,000,000 from 1919 to 1926, exclusive of kindergarten enrollment. One-fifth of the total population were in school in 1919. Assuming the percentage in school to have remained constant, the King estimates have allowed for a normal increase of 2,500,000 in school enrollment during this period as a result of an increase of 12,000,000 in the total population of the United States. This leaves 1,500,000 to be accounted for as growth owing to greater popularity of schooling. This figure, which represents pupils of all ages from primary age through the colleges, has been prorated to determine what fraction of the increase not accounted for by King's estimates is composed of full-time students of 16 years of age and over. It is thus discovered that about 500,000 students have been withdrawn from the ranks of the employed, beyond the number accounted for in the normal growth of population and school enrollment according to the trends during the preceding decade.

The King estimates were made on the assumption that the increased school enrollment was offset by the increased employment of women. This was true during the years 1909 to 1919, but what evidence there is for the more recent period indicates that the proportion of women among the gainfully occupied has remained about constant. Statistics on the matter are available only for limited samples. In Ohio, the proportion of women gainfully occupied has increased by 2 per cent from 1919 to 1926. Conditions in Ohio should be representative of conditions in the country, since Ohio is a large agricultural and also a highly diver-

sified industrial state. Scattered data for Iowa and Illinois fail to reveal any trend, and while women have strengthened their position as a permanent factor in the industrial and commercial life of the country, it appears that they have not increased in relative numerical importance in gainful pursuits during the postwar period. While definite evidence must be delayed until the census of 1930, the King estimates have been here modified for increased school enrollment on the assumption that the proportion of women gainfully occupied has not canceled the effect of more popular education.

There are no data with which to test the general impression that the average age of industrial employees has been declining during the past decade. A small sample, covering some 14,000 employees carrying group insurance with a large insurance company, appears to show that the average age is slightly higher in 1925-1927 than in 1917-1920. In the absence of accurate data, this factor is not considered in the estimates.

Since 1920 the cumulative loss in farm population has been more than 3,000,000 persons. Of this number, certainly a large part should be added to the available supply of nonagricultural labor, since many farmers, migrating to the cities, are in search of jobs in industry and trade. It has been here estimated that at least as large a proportion of those leaving the farm will be gainfully occupied as among those remaining.⁵⁰ While this procedure probably leads to an underestimate of the farm population absorbed in urban employment, the discrepancy is not likely to be large. King's estimates of gainfully occupied agricultural population, while showing an appreciable shrinkage, do not drop so rapidly as the farm population, as estimated by the Bureau of Agricultural Economics. A correction has therefore been made in King's estimates to allow for migration from farm to city of those desiring nonagricultural employment. This correction and the allowance for increased school enrollment partially offset each other.

The most interesting and probably one of the most important changes in employment since the war has been the expansion in nonindustrial employment. This trend is examined with reference to the fields of public and mercantile employment and in a category of miscellaneous occupations. The total number of public employees is much less in 1927 than in 1919, but slightly greater than in 1920. Federal civil service employees were in 1927 more than 100,000 fewer than in 1920, but in the same period the number of state and municipal employees increased by more than 200,000, owing largely to the increase in the number of teachers. Mercantile employment, as shown in Table

⁵⁰ Bureau of Agricultural Economics, *Bulletin*, "The Agricultural Situation," Vol. XII, No. 4, pp. 22-24, April 1, 1928, Washington, D. C.

30,⁵¹ was roughly 1,500,000 greater in 1927 than in 1920. Very little information on the growth of employment in particular lines of mercantile enterprise is available and the figures in the table are the best, and sometimes the only, estimates that could be had.

TABLE 30.—MERCANTILE EMPLOYMENT
(In thousands)

	1920	1921	1922	1923	1924	1925	1926	1927
Attached to mercantile pursuits, total employees (King).....	3,215	3,298	3,694	4,237	4,015	4,297	4,412	4,623
Employees in specified groups (included above):								
Two large mail order houses.....	24							32
Tire dealers and salesmen ^a						95	95	95
Auto dealers and salesmen ^a				181	181	196	225	363
Automobile supplies, parts, etc. ^a				135	135	140	135	160
Oil heating ^b	"							10
Radio ^b	"							40
Electric refrigeration ^b	"							20

^a Estimate taken from *Facts and Figures of the Automobile Industry*, National Automobile Chamber of Commerce.

^b Estimates for radio distribution obtained from Department of Commerce.

" Negligible.

The group of miscellaneous occupations likewise shows a great increase over the period under discussion. The details are shown in Table 31. The estimates for artists, authors, and musicians are probably a gross understatement. They were made on the assumption that these groups increased at least as rapidly as the number of teachers and professors. The increase in the number of insurance agents, estimated from reports of insurance companies, represents the only approximation of employment in the financial group aside from banking. There is no method available for estimating the numbers employed in real estate, home insurance offices, brokerage, mortgage, loan, and specialty financing companies, although it is a commonplace of everyday experience that many more persons are so engaged than before the war. The large growth of the medical and allied professions has come not through a material increase in the number of physicians and surgeons, but through the great growth in the number of nurses, hospital attendants, and those associated with public health activities.⁵²

King's statistics of the gainfully occupied population of the country, with the modifications referred to above embodied in them, are shown in Table 32. The industrial groups of mining and quarrying, transportation, construction, and manufacturing are separated from the groups of public and mercantile employees and miscellaneous occupations, since

⁵¹ The increment of gainfully employed from farms has been arbitrarily divided equally between the mercantile and miscellaneous groups.

⁵² See Chap. I, Consumption, pp. 17-22.

TABLE 31.—MISCELLANEOUS OCCUPATIONAL GROUPS
(In thousands)

	1920	1921	1922	1923	1924	1925	1926	1927
Attached to miscellaneous groups, ^a total.....	5,876	6,028	6,851	6,682	8,030	8,316	8,310	8,338
Employees in specified groups (included above):								
Professional and allied groups ^b —								
Medical and allied professions.....	795	815	995	1,160	1,200	1,235	1,240	1,300
Lawyers and judges.....	125	128	131	134	136	139	142	145
Clergymen ^c	195	199	214	220	218	216	^d 216	^d 215
Religious, charitable, penal workers ^d	53							55
Librarians and assistants ^d	18							22
Artists, authors, musicians ^d	210							250
Financial groups—								
Banking.....	232	246	252	265	271	277	287	291
Insurance agents ^e	120							216
Miscellaneous—								
Hotels, restaurants, etc. ^f	1,500							2,025
Barbers, hairdressers, manicurists ^f	216							385
Moving pictures ^f	200							350
Amusements, lodges ^g	85							135
Garage employees ^h				110	110	115	125	125
Automobile, repair shops ^h						480	450	300
Dyers and cleaners ⁱ	18							33

^a These figures are not adjusted for the slight revisions of King's estimates made in this study. Entrepreneurs as well as employees are included.

^b Teachers should logically be included here, but they cannot conveniently be separated from the public employees group.

^c Figures published in *Yearbook of the Churches*. Estimates are doubtless too high, including ministers otherwise gainfully employed, and otherwise classified in the *United States Census of Occupations*.

^d Groups taken according to *United States Census of Occupations*, 1920, and increased slightly over the period.

^e Increase since *Census of Occupations*, estimated by Lawrence B. Mann, Department of Commerce.

^f Estimated by Lawrence B. Mann, Department of Commerce.

^g Number shown in *United States Census of Occupations*, 1920, increased to correspond with moving pictures.

^h Rough estimates given in *Facts and Figures of the Automobile Industry*, N. A. C. C., New York (published annually).

ⁱ Estimated by Lawrence B. Mann, Department of Commerce.

it is in the former that the problem of unemployment is generally regarded as significant. There is, moreover, no method for estimating the volume of unemployment among public employees, those of mercantile establishments, and those engaged in professional or personal service. The estimates of the number unemployed in these categories are, therefore, largely arbitrary minimum estimates, and are regarded as underestimating the actual volume of unemployment.

Estimates of the numbers attached to industry and the average numbers employed or unemployed for each of the four industrial groups are shown in Tables 33, 34, 35, and 36. For each group there is a considerable mass of statistical material which cannot be described in detail here. It should be noted, in connection with Table 33, that the employment figures for metal mining and quarrying represent the total number

TABLE 32.—CLASSIFICATION OF GAINFULLY OCCUPIED PERSONS IN THE UNITED STATES^a
(In thousands)

	1920	1921	1922	1923	1924	1925	1926	1927
Total population.....	106,422	108,370	109,742	111,478	113,466	115,004	116,442	117,980
Cumulative increase in school attendance, pupils sixteen years of age and older.....		390	629	843	1,028	1,185	1,342	1,430
Total gainfully occupied.....	40,008	40,429	40,701	41,313	42,095	42,659	43,218	43,943
Cumulative increase in nonagricultural gainfully occupied, resulting from migration from farms.....		112	224	336	486	608	802	861
Total nonagricultural gainfully occupied.....	31,137	31,681	32,382	33,024	33,909	34,621	36,491	36,372
Total employees attached to nonagricultural pursuits (entrepreneurs omitted).....	27,558	27,989	28,505	29,293	30,234	30,941	31,808	32,695
Public employees.....	2,719	2,689	2,618	2,633	2,674	2,736	2,785	2,819
Mercantile employees.....	3,215	3,298	3,694	4,237	4,015	4,297	4,412	4,623
Miscellaneous groups ^b	4,057	4,931	4,576	4,488	5,852	6,043	6,318	6,603
Employees attached to major industrial groups.....	17,567	17,071	17,617	17,935	17,693	17,865	18,293	18,650
Mines, quarries, oil wells.....	1,217	1,234	1,250	1,254	1,196	1,182	1,278	1,285
Transportation and communication ^c	4,235	4,151	4,431	4,691	4,658	4,582	4,744	5,204
Construction (excluding highways).....	932	932	1,199	1,277	1,352	1,613	1,594	1,563
Manufacturing.....	11,183	10,754	10,737	10,713	10,487	10,488	10,677	10,598

^a This table represents a slight revision and an array of the King estimates of the number of persons gainfully occupied and attached to various industrial and occupational groups.

^b Including banking and other financial employments, the professions, etc.

^c Bus, truck, and taxi transportation have been added to the original King estimates, and deducted from items for miscellaneous groups.

TABLE 33.—EMPLOYEES—MINES, QUARRIES, OIL WELLS

	1920	1921	1922	1923	1924	1925	1926	1927
Attached to the industries (King):								
Salaried.....	75,000	74,000	75,000	65,000	68,000	70,000	70,000	70,000
Wage earners.....	1,142,000	1,160,000	1,175,000	1,189,000	1,128,000	1,112,000	1,208,000	1,215,000
Total.....	1,217,000	1,234,000	1,250,000	1,254,000	1,196,000	1,182,000	1,278,000	1,285,000
Employed:								
Coal mines ^a	590,000	465,000	400,000	550,000	490,000	470,000	547,000	495,000
Metal mines ^b	137,000	94,000	106,000	123,000	123,000	127,000	128,000	120,000
Quarries ^b	86,000	77,000	79,000	92,000	94,000	92,000	91,000	92,000
Oil and gas.....	130,000							
Unemployed.....	274,000	470,000	520,000	329,000	326,000	308,000	323,000	380,000
Average number days worked by mines:								
Bituminous.....	220	149	142	179	171	195	215	191
Anthracite.....	271	271	151	268	274	182	244	225
Production: Coal (thousands of net tons)—								
Bituminous.....	569,000	416,000	422,000	565,000	484,000	520,000	573,000	518,000
Anthracite.....	90,000	90,000	55,000	93,000	88,000	62,000	84,000	80,000
Petroleum (thousands of barrels).....	443,000	472,000	558,000	732,000	714,000	764,000	767,000	901,000
Natural gas (thousands of cubic feet).....	798,000	662,000	762,000	1,007,000	1,142,000	1,189,000	1,313,000	1,445,000
Indexes of production: ^c								
Bituminous ^d	109	79	78	108	92	100	110	98
Anthracite ^d	110	112	65	115	108	77	105	100
Petroleum ^d	61	64	75	100	97	103	104	122
Natural gas.....	72	60	69	91	103	107	118	130

^a Averages of estimated monthly employment based upon available production and employment statistics for both bituminous and anthracite mines.

^b Figures compiled from reports of the United States Bureau of Mines.

^c 1923-1925 base.

^d Federal Reserve Board.

of workers employed at any time during the year rather than the average monthly employment, as, for example, in the case of manufacturing industries. Therefore the employment totals for these groups are somewhat too high. The figures for coal mining represent the best approximation of the average number of men actually at work daily. This means that men employed at a given mine are regarded as out of work whenever the mine is not operating.⁵³

TABLE 34.—TRANSPORTATION AND COMMUNICATION—NUMBER OF EMPLOYEES ATTACHED TO THE INDUSTRIES^a
(In thousands)

	1920	1921	1922	1923	1924	1925	1926	1927
Total employees attached to the industries ^b	4,235	4,149	4,431	4,691	4,658	4,582	4,744	5,204
Subdivision of the industries:								
Steam railroads,								
switching and terminal companies.....	2,163	2,122	2,097	2,080	2,041	1,891	1,903	1,856
Street railways.....	307	308	308	319	318	317	319	322
Pullman.....	23	23	21	22	25	26	27	28
Express companies.....	91	82	77	75	70	68	68	65
Water transportation.....	399	394	392	388	369	355	354	341
Bus and truck transportation ^c	750	700	1,000	1,220	1,220	1,275	1,400	1,900
Telephone.....	311	318	322	350	370	377	381	385
Telegraph.....	75	75	75	76	77	86	86	86
Electric light and power.....	116	127	139	161	168	187	206	221

^a Based principally upon King's estimates.

^b Including bus transportation.

^c Estimates from *Bus Facts*, 1927 and 1928, Bus Division, American Automobile Association. Includes bus drivers and professional chauffeurs.

The results of the various steps in the process of estimating unemployment are shown in Table 37. These figures are limited to unemployment among the nonagricultural employed, since it is impossible to estimate the agricultural unemployed. As has been pointed out before, the figures of unemployment in the mercantile, public service, and miscel-

⁵³ In all cases, estimates of average employment and unemployment have been arrived at by the study of employment and unemployment data and, in many cases, of other series, such as indexes of production or of value of output. It is impossible to reproduce all of the relevant data involved in estimating the numbers occupied and unemployed in the industrial category of transportation and communication. A great variety of data is used for both estimates: for steam railroads, the reports of the Interstate Commerce Commission; for street railways, local reports on numbers employed; for the Pullman Co., the number of revenue passengers; for the telephone industry, the United States Census of Electrical Industries and figures from the American Telephone and Telegraph Co.; and so on. The percentages of unemployment used in computing the number of unemployed in the building trades were derived from comparisons of the value of building contracts and statistics of unemployment for Ohio and Massachusetts, and for the whole country from the reports of trade union unemployment as compiled by the American Federation of Labor, in relation, of course, to the King estimates.

TABLE 35.—EMPLOYEES IN THE CONSTRUCTION INDUSTRY (EXCLUDING HIGHWAY CONSTRUCTION)

	1920	1921	1922	1923	1924	1925	1926	1927
Attached to the industry (King):								
Salaried.....	82,000	83,000	108,000	115,000	122,000	146,000	145,000	142,000
Wage earners.....	850,000	849,000	1,091,000	1,162,000	1,230,000	1,467,000	1,449,000	1,421,000
Total.....	932,000	932,000	1,199,000	1,277,000	1,352,000	1,613,000	1,594,000	1,563,000
Employed ^a	702,000	684,000	969,000	1,057,000	1,002,000	1,268,000	1,314,000	1,141,000
Unemployed ^b	230,000	248,000	230,000	220,000	350,000	345,000	280,000	422,000
Total value of building contracts awarded in the United States ^c (000 omitted).....	\$3,337,647	\$3,068,983	\$4,329,750	\$4,768,100	\$5,237,080	\$6,662,000	\$6,901,580	\$6,786,580

^a Estimates obtained by subtracting the estimated number of unemployed from the estimate of the number attached, except 1924-1926 inclusive, for which years the estimates were interpolated on the basis of fluctuations in total value of building contracts.

^b Estimates obtained by applying the following estimated percentages of unemployment to the number attached: 1919, 25 per cent; 1920, 24.60 per cent; 1921, 26.7 per cent; 1922, 19.0 per cent; 1923, 17.2 per cent; 1927, 27.0 per cent. Figures for 1924-1926 inclusive were derived by subtracting estimated actual employment from the number attached.

^c Figures furnished by the F. W. Dodge Corporation.

TABLE 36.—EMPLOYEES IN MANUFACTURING INDUSTRY^a

(In thousands)

	1920	1921	1922	1923	1924	1925	1926	1927
Attached to manufacturing (King):								
Wage earners.....	9,735	9,330	9,334	9,328	9,112	9,118	9,290	9,100
Salaried.....	1,448	1,424	1,403	1,385	1,375	1,370	1,387	1,498
Total.....	11,183	10,754	10,737	10,713	10,487	10,488	10,677	10,598
Employed: ^b								
Wage earners.....	9,207	7,042	7,744	8,909	8,266	8,544	8,729	8,510
Salaried.....	1,489	1,158	1,232	1,372	1,297	1,366	1,396	1,361
Total.....	10,696	8,200	8,976	10,281	9,563	9,910	10,125	9,871
Unemployed.....	487	2,554	1,761	432	924	578	552	727

^a Including grist mills, custom saw mills, and power laundries.^b Based upon United States Census of Manufactures.^c Estimates and extrapolations based upon computations by Woodlief Thomas.^d Number of salaried persons estimated on basis of percentage of salaried in total employment for adjacent years.

laneous groups are the least reliable of all and are probably much too low. All of the estimates are approximate measures of the average annual minimum volume of unemployment and are more adequate as indicators of the trend of unemployment than as measures of the actual number unemployed in any year.

By these estimates it appears that unemployment in 1927 was less than half that of 1921 and considerably below 1922. The depression of 1927, measured by the volume of unemployment, appears to have been not so severe as the recession in 1924. Throughout the whole period it is surprising to find a persistent and large volume of unemployment even in the very active years, 1920, 1923, and 1926.

TABLE 37.—ESTIMATED AVERAGE MINIMUM VOLUME OF UNEMPLOYMENT, 1920-1927

(In thousands)

	1920	1921	1922	1923	1924	1925	1926	1927
Total employees attached to nonagricultural pursuits.....	27,558	27,989	28,505	29,293	30,234	30,941	31,808	32,695
Minimum number of unemployed:								
Manufacturing.....	487	2,554	1,761	432	924	578	552	727
Construction.....	230	248	230	220	350	345	280	422
Transportation and communication..	170	598	580	251	340	184	144	152
Mines, quarries, oil wells.....	274	470	520	329	326	308	323	380
Public service, mercantile, miscellaneous.....	240	400	350	300	375	360	370	374
Minimum total unemployed.....	1,401	4,270	3,441	1,532	2,315	1,775	1,669	2,055

V. ORGANIZED LABOR

The historical development of trade unionism in the United States follows in its essentials much the same course as that pursued by foreign labor movements. Beginning with small spontaneous uprisings and becoming gradually a systematic movement for the spread of organization, labor unions here, as elsewhere, have grown with the rise of modern industry. They have made use of the weapons of the strike, picketing, and boycott, either in defense against attack or in carrying organization into unorganized areas, and have thus slowly and over a long period added to their numbers and influence. From 1900 to 1910, American labor unions gained nearly 1,200,000 members and, from 1910 to 1915, a half million more. Immediately before the war their total membership was two and three-quarters millions.

This moderate trend upward, which has persisted with only slight occasional recessions since 1897, became greatly accelerated during the war. American unions, in common with labor organizations all over the world, responded promptly to the economic and political forces associated with the World War and rose to new heights. By 1920 union membership was nearly double that of 1914 and stood at 5,100,000. The gains of the period, moreover, were scattered over a wide industrial area. Not only did the old, strong organizations grow, but unions were established where there had before been little or no organization at all. Effective trade unions sprang up among the shopcraft and maintenance-of-way employees on the railroads; in the manufacturing industries unorganized strongholds like the textile, metal and machinery, leather, food, and men's clothing industries were all unionized; and organization took root among many clerical and semiprofessional occupations in both public service and private business.

Labor organization proved to be as sensitive to the business depression and unemployment of the period following the middle of 1920 as it had just been to prosperity and a favorable labor market. By 1924 the American labor movement had lost nearly 1,500,000 members. The bulk of these losses was precisely in those occupations and industries in which the growth during the war had been greatest. Of a total drop in membership from 1920 to 1923 of 1,330,000, the transportation and metal unions together lost 800,000 members.⁵⁴

With the turn in the business situation in 1922, followed by years of considerable business activity and prosperity, the labor movement was commonly expected to retrieve its early postwar losses. This expectation was not realized. Although the statistics of membership show a

⁵⁴ For a detailed discussion of the movement of trade union membership in the United States, see Leo Wolman, *The Growth of American Trade Unions, 1880-1923*, National Bureau of Economic Research, 1924.

TABLE 38.—MEMBERSHIP OF AMERICAN TRADE UNIONS^a

Year	Membership	Year	Membership	Year	Membership
1897.....	447,000	1908.....	2,130,600	1918.....	3,508,400
1898.....	500,700	1909.....	2,047,400	1919.....	4,169,100
1899.....	611,000	1910.....	2,184,200	1920.....	5,110,800
1900.....	868,500	1911.....	2,382,800	1921.....	4,815,000
1901.....	1,124,700	1912.....	2,483,500	1922.....	4,059,400
1902.....	1,375,900	1913.....	2,753,400	1923.....	3,747,200
1903.....	1,913,900	1914.....	2,716,900	1924.....	3,746,600
1904.....	2,072,700	1915.....	2,607,700	1925.....	3,817,900
1905.....	2,022,300	1916.....	2,808,000	1926.....	3,900,500
1906.....	1,958,700	1917.....	3,104,600	1927.....	3,903,800
1907.....	2,122,800				

^a The figures since 1923 were collected by Ruth Budinoff, of the Labor Bureau, Inc.

rise of about 150,000 from the low point in 1924, a considerable portion of the increase may be attributed to overstatement by many of the smaller unions and in particular by the large United Mine Workers. This organization reports its membership in 1927 as 400,000, or about 64,000 in excess of its membership in 1920. It is common knowledge that the United Mine Workers have lost heavily since 1920, not only in the non-union areas of Kentucky and West Virginia, but in the union fields of Pennsylvania, Ohio, and Indiana, as well. It would do no violence to the facts, therefore, to consider the present membership of the United Mine Workers as closer to 300,000 than to 400,000. When these factors are taken into consideration, it is clear that the downward movement which began late in 1920 has not yet been effectively stopped.

As matters stand now, the movement has about 1,000,000 more members than it had in 1913. Very little of this increase, however, represents the war growth in manufacturing industries, where, in fact, trade union membership is probably less now than it was before the war. As Table 39 shows, the net increase of 1,000,000 is made up almost

TABLE 39.—INCREASE IN MEMBERSHIP OF TRADE UNIONS

Industry	Membership		Gain
	1913	1927	
Building trades.....	553,000	1,014,000	461,000
Clothing.....	164,000	283,000	119,000
Theaters and music.....	82,000	171,000	89,000
Transportation.....	557,000	950,000	393,000
Paper, printing, and bookbinding.....	107,000	161,000	54,000
Total.....	1,463,000	2,579,000	1,116,000

exclusively of gains in the nonmanufacturing industries. Only in the printing and clothing industries, in the manufacturing group, is there a steady growth over 1913. The rest of the unions in the manufacturing industries either show slight increases, like 6,000 in the textile industry and 14,000 in metals, machinery, and shipbuilding, or actual decreases, like 6,000 in leather, 57,000 in food, liquor, and tobacco, and 15,000 in the chemical, clay, glass, and stone industries. Meanwhile, the great basic manufacturing industries of the country, iron and steel, metals and machinery, food, automobiles, and textiles, are less organized now than they were before or during the war.

In the absence of a new Census of Occupations, little would be gained by attempting to convert these figures of growth and decline into more precise estimates of the present strength of the American labor movement.⁵⁸ Allowing for some increase in the total working population of the country since 1920, it is probable that all American wage earners, excluding agricultural labor, were roughly one-fifth organized. In view of the marked increases in membership in the building trades and the transportation industry, organization in both has probably grown to nearly 50 per cent. In coal mining, on the other hand, the extent of organization has dropped from about 50 per cent in 1920 to well below 40 in 1927; and in the general category of manufacturing industries, from a bit more than one-fifth in 1920 to a figure closer to one-sixth at the present time. Women membership is difficult to measure. But such figures as there are indicate that most of the gains of the war have been lost and that there is substantial organization among women only in the clothing industry and among the railway clerks.

The uneven growth of trade unions has profoundly affected the internal constitution of the American labor movement. From 1913, and even from 1920 to 1927, the position of the transportation and building unions has become increasingly important in the movement. In 1927, the two groups represented one-half of the total membership of American trade unions. In the next years their relative position is likely to improve, both because they show signs of continuing to grow and because the remaining groups in the movement show no signs of swift recovery. It is interesting to observe that, in the main, American unions have grown in those industries where the conditions of business competition are quite different from those prevailing throughout the manufacturing and coal industries. The rail transportation industry is under extensive public control, while the competitive area of the building industry is, by its very nature, highly restricted.

In consequence, perhaps, of this experience since the war, many parts of the labor movement have devoted serious attention to their economic policy and have, in some instances, subjected it to drastic revision.

⁵⁸ Wolman, *op. cit.*, Chaps. III and IV.

TABLE 40.—PER CENT OF TOTAL MEMBERSHIP IN EACH GROUP

Group	1913	1920	1927
All groups.....	100.0	100.0	100.0
Transportation.....	20.2	24.6	24.0
Building.....	20.1	17.4	26.0
Metal, machinery, and shipbuilding.....	8.0	16.8	6.0
Food, liquor, and tobacco.....	4.9	2.3	2.0
Paper, printing, and bookbinding.....	3.9	3.2	4.1
Chemicals, clay, glass, and stone.....	2.0	1.0	1.1
Mining and quarrying.....	15.7	8.2	10.4
Leather.....	2.0	2.2	1.3
Clothing.....	5.9	7.1	7.3
Public service.....	3.1	3.2	6.1
Textiles.....	1.1	2.9	1.0
Theaters and music.....	3.0	1.9	4.4
Restaurant and trade.....	3.3	2.8	1.6
Lumber and woodworking.....	0.9	0.5	0.4
Miscellaneous.....	5.9	5.9	4.3

Substantially, changing trade union policy has manifested itself in a greater preoccupation with the problems of production. In the widely heralded experiment in union-management co-operation, known as the "B and O Plan," the essence of the experiment is the assumption by the union of responsibility for efficiency and output. The developments in the men's clothing industry have been even more far-reaching. Here the Amalgamated Clothing Workers has gone so far as to undertake for manufacturers the opening of new units of manufacture and to share with the management, in both the new and the old shops, the burdens of supervision, thus reducing overhead costs directly and many items of labor cost indirectly. Similar beginnings are said to be taking place in the full-fashioned hosiery industry. The latest arrangement of this nature was recently made through an agreement between the Mitten Management and the Amalgamated Association of Street and Electric Railway Employees, whereby the Mitten Management may agree to union recognition on its properties if, by secret ballot, the employees choose the union as their representative, and if the same co-operation and efficiency is achieved as now prevails within the Mitten Management enterprises in the cities of Philadelphia and Buffalo.

Traditional trade union attitudes toward restriction of output and the introduction of machinery have unquestionably been severely modified in these past years. A growing number of unions have come to a clearer notion of their stake in the prosperity of the industry over which they claim jurisdiction; and the recent experience of the United Mine Workers will no doubt contribute to strengthen the view that labor organizations cannot successfully and to their own ultimate benefit obstruct technical progress in industry. At the same time, the American Federation of Labor and its constituent unions have sought to adapt

organized labor's principles of wage fixing to the conditions of a mechanized and more efficient industry, by enunciating the doctrine that wages should rise proportionately with the increased productivity of labor.

The course of American industry since the war has, likewise, given a new turn to labor's concern with unemployment. The belief that the introduction of machinery has led to extensive displacement of labor and to persistent unemployment has led organized labor to demand the progressive shortening of the work-week and the acceptance by industry of its responsibility for such displaced labor. Except in its discussion of the five-day week and of the device of a public works reserve for times of unemployment, the proposals of the labor movement for handling the problem of industrial unemployment have not yet passed much beyond the elementary stage. In the various branches of the needle trades, several unions, by agreement with the organized manufacturers, have, since 1920, set up unemployment insurance funds, that are based on contributions made either by the manufacturer and union together, or by the manufacturer alone. The contributions to these funds run from $1\frac{1}{2}$ per cent to $4\frac{1}{2}$ per cent of the total weekly union pay roll of the firms under agreement with the union. At present the largest of the unemployment funds is that under the Amalgamated Clothing Workers of America, which covers some 70,000 workers in the men's clothing industry of Chicago, Rochester, and New York.

These postwar developments in trade union policy and in the methods of collective bargaining have been accompanied by the widening of the general economic activities of organized labor. While the experiments in workers' control, born during the war in the form of workers' management in the Rock Island Arsenal or of the Plumb Plan on the railroads, have since been abandoned, American unions have shown an inclination to engage in collateral enterprises quite novel in the history of American labor. The first of these began in 1920 with the organization of banks owned by unions and their members. It was assumed at the outset that these institutions would be limited dividend corporations, owned or controlled by organized labor. The movement of labor banking grew rapidly until it reached its peak in December, 1926, when 36 labor banks had accumulated resources of \$127,000,000. Meanwhile the banks of the Brotherhood of Locomotive Engineers, the largest link in the movement, ran into difficulties of management and were forced to dispose of a part of their large holdings. Several of the smaller banks changed hands or closed down. At the last accounting, on December 31, 1928, there remained 27 labor banks with combined resources of \$116,300,000.

The method of the limited dividend corporation has also been carried by organized labor into the business of life and health insurance. Both the Electrical Workers' Union and the American Federation of Labor

itself, have organized life insurance companies, whose ownership is entirely in the hands of unions and of union members, to sell all forms of insurance to the general public as well as to members of labor organizations.⁵⁶ Finally, the same principles of business organization and labor control have been adopted by various unions for creating investment trusts and for the building of co-operative houses for working men.

Whatever promise these new activities of labor hold, and what influence they will have on the position of American labor in the future, it is too early to estimate. The enterprises are all young. Some have already changed their character and retain hardly any of the distinctive features with which they started; while a few have gone far in exploiting the potentialities of labor enterprises. At the moment, however, they are no more than an evidence of a fresh orientation in the outlook of the labor movement.

Much of this new attitude of organized labor may be attributed to the peculiar industrial situation that has prevailed in the United States since 1922. The quick recovery of business in 1922, and its comparative stability since, failed to have the anticipated effects on the growth of trade unions. In the light of all past experience it was to have been expected that the labor movement would, by 1928, more than have recovered its earlier losses. This it has not done, and the failure to do so has, without doubt, turned the attention of the movement toward an estimate of its own methods and outlook.

Adding further complexity to the situation has been the growth of devices and institutions which, in their present magnitude at least, are quite foreign to the American scene. The foremost of these is the company union, or employee representation plan, or works council. While such organizations of labor are not all alike, they all differ from the trade union in fundamental respects. They are organized through the initiative of the employer. Their jurisdiction is not spread over the whole of a competitive area, as is that of a labor union, but is limited to a single plant or single ownership. They do not, therefore, regard the standardization of wages and working conditions throughout a competitive area as one of their principal functions. They differ from the trade union, and among themselves, in the degree in which they enjoy freedom of action. They are not a new institution in American industrial relations, but they have grown very rapidly since the war and may at the present time claim considerably more than 1,000,000 members. Organized in some instances to replace existing labor unions, either during or after a strike, and set up elsewhere in plants where there has been no trade union, these plans

⁵⁶ On August 31, 1928, the Union Labor Life Insurance Co. had insurance outstanding of \$37,523,000, of which less than \$2,000,000 was ordinary and the balance group insurance. At the same time, the Union Co-operative Life Insurance Co., the Electrical Workers' company, had written more than \$50,000,000 of insurance.

of employee representation have so far had the effect of retarding the growth of organized labor.

Of like effect have been the so-called welfare features established in many industries, either in connection with company unions or independent of them. The content of welfare plans differs widely, but nearly all now make some provision for workers' insurance, principally against death, but in increasing measure against total disability, sickness, and old age, as well. The form of workers' insurance which is most significant in this connection is that commonly known as group insurance, which is clearly distinguishable from other existing forms of personal insurance. The coverage is a group and not an individual; membership in the group, for insurance purposes, begins and terminates with the acquisition or loss of a job; the term of the insurance is usually one year; contracts are made without physical examination; the rates are low; insurance ceases with the loss of a job, except that the individual may, without physical examination, buy ordinary life insurance at the regular rate for his age; and the premium is paid either in whole or in part by the employer. Group insurance of this type, a very small item in the insurance business before the war, is now a business of very considerable magnitude.

Both the plans of employee representation and group insurance are assumed to tie workingmen closer to their shops and factories and to establish a new and more binding relationship between them and their jobs. The same ends, it is believed, are being served by the increase in workers' purchases of industrial investments. In view of the importance which is now generally attached to these developments in the United States and of their significance on their own account, it is essential to examine their size and rate of growth.

Workers' Insurance.⁵⁷—It is impossible among the many types of life insurance sold in this country to segregate the precise amount bought by workingmen. Some examination of the total volume of life insurance now in force and of the distribution of this total among the various classes of insurance will, however, yield a rough measure of the order of magnitude of workers' insurance and throw considerable light on its growing importance.

Life insurance as a whole has, in the United States, been growing without interruption and at a rate much faster than the population of the country. Table 41, which shows the total and per capita amount of life insurance in force in commercial companies from 1911 to 1927, reveals the striking rate of increase for all of the combined forms of life insurance and the contrast between the growth before and after the World War. In the five years from 1911 to 1915, the increase in per capita insurance

⁵⁷ The material on this subject was compiled by Elizabeth Steele, of the Metropolitan Life Insurance Co.

in force was 19 per cent; in the next five years, 62 per cent; from 1921 to 1925, 47 per cent; and from 1926 to 1927, 9 per cent.

TABLE 41.—TOTAL AND PER CAPITA LIFE INSURANCE IN FORCE

Year	Population, continental United States	Amount in force—all classes	
		Total insurance	Per capita
1911.....	93,682,189	\$17,730,128,000	\$189
1912.....	95,097,298	18,955,471,000	199
1913.....	96,512,407	20,204,437,000	209
1914.....	97,927,516	21,202,140,000	217
1915.....	99,342,625	22,360,475,000	225
1916.....	100,757,735	24,211,590,000	240
1917.....	102,172,845	26,659,071,000	261
1918.....	103,587,955	29,250,471,000	282
1919.....	105,003,065	35,120,630,000	334
1920.....	106,421,621	41,364,115,000	389
1921.....	108,444,777	44,991,807,000	415
1922.....	109,893,003	49,225,064,000	448
1923.....	111,693,474	55,653,480,000	498
1924.....	113,727,432	62,531,016,000	550
1925.....	115,378,094	70,261,274,000	609
1926.....	117,136,000	76,973,268,000	657
1927.....	118,628,000	84,801,409,000	715

Ordinary life insurance is still the most popular form and accounted in 1927 for roughly three-fourths of the total amount in force. It appears also to be growing at no diminished rate, and its present absolute annual increase is greater than that of group and industrial life insurance combined. No material is available that would permit the distribution of the ordinary life insurance now in force among wage earners and low-salaried workers, and other economic classes. But it is known that a substantial and growing volume of ordinary insurance is held by the former group.⁵⁸

⁵⁸ A study of the average amount of ordinary life insurance held in 1927 by the members of various occupations was recently made by the Phoenix Mutual Life Insurance Co., of Hartford, Conn. Their analysis, based on some 20,000 cases, shows the following very interesting figures:

Occupation	Average per capita insurance held, 1927
Office employees.....	\$4,043
Retail clerks in stores.....	3,450
Skilled workers in manufacturing.....	4,594
Unskilled workers in transportation.....	3,163

While these amounts appear large, they are for the past few years by no means improbable.

TABLE 42.—AMOUNTS OF LIFE INSURANCE IN FORCE, BY CLASSES
(In thousands of dollars) †

Year	Amounts of life insurance in force		
	Ordinary	Group	Industrial
1911.....	14,374,539	.....	3,355,589
1912.....	15,315,802	13,172	3,626,497
1913.....	16,304,966	31,202	3,868,269
1914.....	17,091,561	64,468	4,046,111
1915.....	17,956,463	99,049	4,304,963
1916.....	19,396,661	152,859	4,662,070
1917.....	21,261,234	346,525	5,051,312
1918.....	23,122,510	627,008	5,500,953
1919.....	27,611,252	1,135,036	6,374,342
1920.....	32,827,156	1,614,387	6,922,572
1921.....	35,710,348	1,575,821	7,705,638
1922.....	38,861,734	1,808,211	8,555,119
1923.....	43,476,206	2,430,829	9,746,445
1924.....	48,457,565	3,133,620	10,939,831
1925.....	53,671,545	4,228,345	12,361,384
1926.....	58,117,778	5,338,655	13,516,835
1927.....	64,052,576	6,274,636	14,474,197

With this growth in insurance outstanding, the income arising out of the payment of death claims, matured endowments, annuities paid, and

TABLE 43.—PAYMENTS TO POLICYHOLDERS

Year	Total payments to policyholders			
	Industrial	Group	Fraternal and assessment	Total
1911.....	\$ 74,275,662	.....	\$ 89,665,297	\$163,940,959
1912.....	81,287,041	.....	101,163,921	182,450,962
1913.....	89,138,370	.....	105,919,898	195,058,268
1914.....	102,711,514	.....	103,033,658	205,745,172
1915.....	113,591,045	.....	102,863,175	216,454,220
1916.....	119,843,381	.....	111,874,449	231,717,830
1917.....	131,107,031	.....	102,088,575	233,195,606
1918.....	187,170,711	.....	124,010,149	311,180,860
1919.....	168,962,217	\$ 6,595,261	148,366,992	323,924,470
1920.....	172,743,541	10,762,470	114,440,177	297,946,188
1921.....	195,494,551	10,591,889	112,794,046	318,880,486
1922.....	244,029,395	11,498,920	115,264,376	370,792,691
1923.....	292,322,353	15,544,620	115,091,446	422,958,419
1924.....	331,342,194	19,415,437	125,612,037	476,369,668
1925.....	385,572,212	25,772,140	131,426,104	542,770,456
1926.....	441,449,574	34,462,608	134,355,300	610,267,482
1927.....	505,166,137	40,749,476	184,758,547	730,674,160

disability, dividends, and payments for lapsed, surrendered, and purchased policies has become a substantial addition to the incomes of policyholders. The known streams of insurance income are shown in Table 43. All fraternal and assessment insurance may not be workers' insurance, but since the average amount of such insurance held is small, the bulk of it must be insurance of the lower income groups. The figures for workers' health insurance and old age pensions cannot be segregated, but they are said to be small. Adding to the figures that are clearly workers' income from insurance the further income that flows to workers from their holdings of ordinary life insurance and from workmen's compensation, it is clear that the present annual income to the wage-earning and lower-salaried groups from insurance must be more than one billion dollars.

Workers' Investments.—The growth of personal insurance in all of its forms finds its counterpart in the widening diffusion of corporate stock ownership in this country. In part, this phenomenon is nothing more than one of many features in the development of the American investment market; in part it is the result of the deliberate policy of many business enterprises designed to encourage their workingmen to share in the ownership of the business. Particularly since 1920 a growing number of large and small businesses have made arrangements with their employees whereby they may purchase a limited number of the firm's shares of stock, usually on the condition that the shares so purchased are paid for by weekly or monthly installments deducted from wages.⁵⁹

On the whole matter of the diffusion of stock ownership it is still difficult to obtain reliable and useful information. That ownership is more general than it used to be, and is constantly becoming more so, is reasonably clear. But that this movement has radically affected the distribution of wealth and income in the country, or that it is an evidence of marked changes in distribution, is doubtful. An elaborate investigation by the Federal Trade Commission of the situation in this regard in 1922 led that agency to the conclusion that the "data indicate a very wide distribution of corporate stock among individuals" but "it was not possible from the information supplied by the corporations (4,367 corporations were studied by the Commission) to analyze the proportions owned by different individual stockholders or the extent to which stock was held by a few individuals." The Commission did find, however,

⁵⁹ There are a great number of such arrangements now in force in American industry and they are described in detail in R. F. Foerster and E. H. Dietel, *Employee Stock Ownership in the United States*, Princeton University, 1926, and in *Employee Stock Purchase Plans in the United States*, National Industrial Conference Board, New York, 1928.

that "nearly one-third of all corporate stockholders in 1922 held not more than \$500 worth of stock each."⁶⁰

In estimating the volume of securities held by employees, there are two fundamental statistical difficulties; first, that it is impossible to procure a frequency distribution of individuals' holdings of securities, and second, that the term employees is so used as to include not only wage earners and lower-salaried employees, but executives and higher-salaried employees, as well. Thus when the Federal Trade Commission found for the year 1922 that the "average holdings per person for employees" was \$1,419 of common stock and \$2,803 of preferred stock, the group of employees must obviously have included many in the higher income classes.⁶¹

But the evidence that there has been a marked growth in stock ownership by workingmen is too strong to be disregarded. A recent study of plans of employee stock ownership, made by the National Industrial Conference Board, comes to the conclusion that a minimum estimate of such employee holdings would place their volume in 1927 at more than a billion dollars. A summary of their findings on stock ownership is given in Table 44, taken from the Board's report. But with reference

TABLE 44.—EXTENT OF EMPLOYEE STOCK OWNERSHIP AMONG 315 COMPANIES IN THE UNITED STATES, 1927^a

Type of plan and eligibility of employees	Number of companies	Number of employees		Market value of shares ^b
		Total	Stock-holders and subscribers	
Active purchase plan.....	^c 253	2,439,844	736,641	\$936,140,941
Rank and file of employees.....	^d 230	2,397,298	733,112	909,134,425
Selected employees.....	23	42,551	3,529	27,066,516
Inactive purchase plan ^e	51	236,207	30,582	60,466,372
Rank and file of employees.....	46	230,788	30,322	59,327,862
Selected employees.....	5	5,419	260	1,138,510
Profit sharing, bonuses, etc.....	11	60,392	38,845	48,543,097
All plans.....	^d 315	2,736,448	806,068	*\$1,045,150,410

^a This estimate is probably a minimum. Moreover, it does not include \$10,825,000 worth of securities of two companies known to be owned by the employees jointly, in addition to those which are owned by them individually.

^b These values relate for the most part to the middle of 1927, when prices of some shares were unusually high. In many other cases, however, there had been no such unusual inflation. For thirty-five companies, book or par value was used, in the absence of data regarding market value.

^c Plans that have been discontinued.

^d Includes four companies, whose plans were not analyzed in detail.

^e Includes \$11,550,000 jointly owned by 11,500 employees of the Philadelphia Rapid Transit Co.

⁶⁰ *National Wealth and Income*, United States Sen. Doc., No. 126, 69th Congress, 1st Session, Washington, 1926, pp. 148, 151.

⁶¹ *Ibid.*, p. 148.

to the degree of control exercised by these stockholders, the Board comes to much the same conclusions as those reached by the Federal Trade Commission for its study of the year 1922. At that time the Commission found that while "employees comprised 7.5 per cent of the common stockholders reported and 3.5 per cent of the preferred stockholders," they "had only 1.5 per cent of the common stock and 2 per cent of the preferred."⁶² Similarly, the Industrial Relations Section of Princeton University, reviewing employee stock ownership in 20 large corporations in 1926, found that employee stockholders comprised 21 per cent of all of the stockholders of these companies, but that their holdings represented only 4.3 per cent of the market value of the total stock outstanding.⁶³

VI. INDUSTRIAL DISPUTES

The bare statistical records of strikes and lockouts cannot always give a true picture of the prevalence of peace or conflict in industry. Industrial disputes differ in intensity, in the degree to which they succeed in interrupting production, and in the effects produced by their settlement. Considerations such as these are not measurable, but a knowledge of them will qualify many patent conclusions drawn from a study of the number of industrial disputes.

Measured by any standard, the period since 1922 has been remarkably free of upheavals in industrial relations.⁶⁴ Although the reporting of the number of persons involved in disputes was more inclusive after 1922 than before, yet in the six-year period from 1922 to 1927 both the number of disputes and the number of strikers show a sharp decline over the preceding years from 1916 to 1921. These average figures, moreover,

TABLE 45.—NUMBER OF DISPUTES AND EMPLOYEES INVOLVED

Period	Annual average	
	All disputes	Number of employees involved
1916-1921.....	3,503	1,798,301
1922-1926.....	1,164	688,538

distort the picture somewhat, partly because the year 1922, one of large strikes, more properly belongs in the earlier period, and partly because

⁶² *Ibid.*, p. 160.

⁶³ *Employee Stock Purchase Plans in the United States*, National Industrial Conference Board, p. 39.

⁶⁴ The statistical material in this section was compiled, from the reports of the United States Bureau of Labor Statistics, by Ben M. Selekmán.

they conceal the steady decrease in disputes since 1922. This decline is shown in Table 46. Unfortunately, the record of industrial disputes is not available for the years immediately before the war, but comparison of these war and postwar figures with the elaborate statistics from 1881 to 1905 would appear to indicate that the number of disputes has since 1922 been less than then, whereas the number of employees involved was relatively slightly greater in the late than in the early period.

TABLE 46.—INDEX NUMBERS OF INDUSTRIAL DISPUTES AND NUMBER OF EMPLOYEES
(1916 = 100)

Year	Industrial disputes	Employees involved	Year	Industrial disputes	Employees involved
1916.....	100	100	1922.....	29	101
1917.....	117	77	1923.....	41	47
1918.....	88	78	1924.....	33	41
1919.....	96	260	1925.....	34	27
1920.....	90	91	1926.....	27	21
1921.....	63	69	1927.....	19	22

The comparative quiet of these last years is all the more marked in contrast with the state of affairs before 1923, when there took place some of the largest and longest strikes in the history of the country. In 1919, more than 1,000,000 workers were involved in strikes in the coal, steel, and railroad industries; disputes in the building trades of Chicago and New York resulted in a strike of 250,000; 100,000 longshoremen along the Atlantic Coast stopped work; a strike in the stockyards of Chicago brought out 65,000 strikers; and strikes in the clothing and textile industries several hundred thousand more. Altogether, the reports to the United States Bureau of Labor Statistics indicate more than 4,000,000 persons involved in industrial disputes in 1919. The following years were quieter but by no means free of strikes. In 1920 there were the large "outlaw" strikes of railway switchmen and yardmen and the strike of the anthracite miners; in the year following, a strike of the marine workers in all principal ports, and conflicts in the clothing, building, and packing industries; and in 1922, when the number of reported strikers rose to 1,600,000, there took place the great strikes of the coal miners and of the railroad shopmen.

Major industrial disputes during these latest years have been largely localized in the coal, textile, and clothing industries. In the coal industry, strikes have been almost continuous and appear now to be stopping, at least temporarily, with the abandonment by the United Mine Workers of the Jacksonville agreement and with a recent decision of the union authorizing the district organizations to negotiate their own agreements with the operators. Unsettled conditions in all branches of the New

England textile industry, accompanied by frequent attempts to cut wages, have precipitated bitter strikes, particularly in Passaic and New Bedford; while the movement to introduce the 40-hour week, organization campaigns against non-union manufacturers, and a struggle for control of unions between the administrations of several organizations and the Workers' Party have been the principal causes of conflict in the many branches of the clothing industry.

VII. SUMMARY

Since 1920, the most striking changes in the supply of labor have been associated with the policy of immigration restriction, the growth of industry in the South, and the falling birth and mortality rates. Wage rates are a useful measure of the changing position of labor. The most striking feature is the slight decline in wage rates during the severe depression from 1920 to 1922 and the recovery since 1922.

In manufacturing industries there has been a reduction in the nominal work-week of roughly five hours from 1914 to the present, and the prevailing hours of labor are now around 50 a week. Since 1922 it seems likely that labor costs have continued to fall.

Production per capita is now nearly 60 per cent greater than it was in the closing years of the nineteenth century. The output per worker engaged directly in production has increased 80 per cent during the same period. The precipitate rate of advance in productivity, which began in 1922 and continued through 1925, has slackened.

Comparisons of prewar and postwar employment in manufacturing industries show no startling differences between the normal stability of employment before the war and the condition after the recovery from the depression of 1920-21. Measures of labor turnover in manufacturing industries confirm the impression of stability shown by the index of employment and income.

Lack of machinery for compulsory registration makes difficult a determination of the amount of unemployment. Estimated average unemployment, is arrived at by taking the difference between the number of persons actually employed and the number desiring and habitually dependent upon employment. The most interesting and probably one of the most important changes in postwar employment has been the expansion of nonindustrial employment. Measured by the volume of unemployment, the recession of 1927 does not appear to have been so severe as that in 1924. Throughout the whole period there is a large and persistent volume of unemployment, even in the very active years.

It is probable that American wage earners, excluding agricultural labor, are about one-fifth organized. Since 1920, the position of the transportation and building unions has become increasingly important. In 1927, these two groups represented one-half of the total union member-

ship. In general, American unions have grown in those industries where the conditions of business competition are quite different from those prevailing throughout the manufacturing and coal industries.

Union policy is much more preoccupied with problems of production, as shown by the experiments in co-operation and the relaxation of the traditional trade union attitude toward the introduction of machinery. The American Federation of Labor has initiated the doctrine that wages should rise proportionately with the increased productivity of labor. Labor is much more preoccupied with unemployment, and has demanded the progressive shortening of the work-week and the acceptance by industry of its responsibility for labor displaced by improved machinery and methods. Unemployment reserve funds of various sorts have been set up. Unions have shown an inclination to engage in such enterprises as banking, and life and health insurance. Company unions have grown rapidly and claim more than one million members. The increased number of corporate stockowners has been important.

The period since 1922 has been remarkably free from strikes and lockouts.

