UNITED STATES DEPARTMENT OF LABOR
L. B. Schwellenbach, *Secretary*
BUREAU OF LABOR STATISTICS
Isador Lubin, *Commissioner* (on leave)
A. F. Hinrichs, *Acting Commissioner*

✦

War and Postwar Wages, Prices, and Hours 1914–23 and 1939–44

Bulletin No. 852

For sale by the Superintendent of Documents, U. S. Government Printing Office
Washington 25, D. C. - Price 10 cents

Letter of Transmittal

UNITED STATES DEPARTMENT OF LABOR,
BUREAU OF LABOR STATISTICS,
Washington, D. C., December 5, 1945.

The SECRETARY OF LABOR:

I have the honor to transmit herewith a report on war and postwar wages, prices, and hours, 1914–23 and 1939–44, in two parts: 1.—Comparisons of World Wars I and II, and 2.—War and postwar trends. The report was prepared by Witt Bowden of the Bureau's Labor Economics Staff, assisted by Edith E. Hill and Marilyn D. Sworzyn.

A. F. HINRICHS, *Acting Commissioner.*

Hon. L. B. SCHWELLENBACH,
Secretary of Labor.

Contents

Bulletin No. 852 of the

United States Bureau of Labor Statistics

[Reprinted from the MONTHLY LABOR REVIEW, October and November 1945]

War and Postwar Wages, Prices, and Hours, 1914–23 and 1939–44

Part 1.—Comparison of World Wars I and II

Summary

A widespread interest in historical analogies and comparisons has been particularly evident in connection with World Wars I and II. Recently this interest has extended to the period following the First World War and the possible course of events after the Second World War. This report deals with three important phases of such comparisons, namely, wages, prices, and hours of work, with incidental references to related subjects.

Comparisons of this nature necessarily have serious limitations. Not the least of these is the inadequate nature of available information, especially for the earlier period. It is impossible to trace the course of wages and hours in detail during the First World War, but extensive information is available for the years 1914 and 1919 and for succeeding years. The years 1914 to 1919 are compared with the corresponding 5-year period from 1939 to 1944. Changes during the concluding months of World War II were comparatively slight. Between June 1944 and June 1945, the hourly earnings of factory workers rose 2.0 percent; their weekly hours fell 1.5 percent; the index of consumers' prices[1] rose 2.9 percent; and the wholesale price index rose 1.7 percent. The two equal periods from 1914 to 1919 and from 1939 to 1944 covered broadly similar conditions of war in Europe and of American preparation for war or actual warfare. These time comparisons, although imperfect, are the best that can be made with available statistics. It is believed that the data are sufficiently comparable and that the basic conditions are sufficiently analogous to give considerable interest to such a study as is undertaken in the present article.

Average hourly earnings more than doubled between 1914 and 1919, the increase being mainly a result of changes in basic rates of wages. Increases far smaller occurred from 1939 to 1944, and yet factors other than basic wage-rate changes, especially premium payments for overtime, were much more important than in the First World War. The increase in gross average hourly earnings in factories from 1939 to 1944 was 61 percent; the increase in basic wage rates was hardly more than 35 percent.

[1] Formerly called the index of cost of living.

Increases in average weekly earnings during the two periods were not radically different, especially in factory earnings, in which the rise in the first period was about 100 percent, and in the second period, 93 percent. When pay-roll deductions are considered, however, the difference is much greater, for the large deductions for taxes and bonds made it impossible, in the Second World War, to view weekly earnings as "take home" pay available for current consumption.

The adoption of a national stabilization program during the Second World War was a major factor in preventing both wages and prices from rising as much as in the First World War. The index of consumers' prices (formerly called the index of cost of living) rose 72.4 percent from 1914 to 1919, in contrast to a rise of only 26.3 percent from 1939 to 1944. The increases in wholesale prices were larger in both periods than were those in consumers' prices, but the index of consumers' prices fell less between the two wars. As a net result, the index of consumers' prices in both 1939 and 1944 was at a higher level, in relation to 1914, than was the index of wholesale prices.

The workweek was somewhat shorter in 1919 than in 1914 but much longer in 1944 than in 1939. The reductions during the First World War were made from levels far higher than those of 1939. The prevailing workweek in factories in 1914 averaged 55.1 hours, in contrast to the usual 40-hour week in 1939. Weekly hours actually worked in factories fell from 49.4 in 1914 to 46.3 in 1919 and rose from 37.7 in 1939 to 45.2 in 1944.

Wage Changes in the Two World Wars

MANUFACTURING, MINING, AND RAILROADS

The broadest comparisons of wages during the two World Wars relate to manufacturing, coal mining, and railroads (table 1). Average hourly earnings in manufacturing rose from $0.223 in 1914 to $0.477 in 1919, an increase of 113.9 percent. Similar percentage advances occurred in bituminous-coal mining and steam railroads. Workers in the bituminous-coal mining industry, however, received higher wages, the average for 1914 being $0.358, and for 1919, $0.759. Bituminous-coal mining employed a comparatively large proportion of skilled workers engaged in heavy and hazardous occupations. The hourly earnings of railroad workers, comprising a wide variety of occupations, averaged $0.252 in 1914 and $0.537 in 1919.

The increases in average hourly earnings from 1939 to 1944 were comparatively small, ranging from 27.6 percent in anthracite mining to 61.0 percent in manufacturing. The average for factory workers rose much more than did the averages for most of the nonmanufacturing groups. In retail trade, for example, the largest of the nonmanufacturing groups, the increase was only 35.1 percent.

The rise in average hourly earnings from 1939 to 1944 was not only much smaller than from 1914 to 1919 but was also more largely a result of temporary increases in premium payments for overtime. The average of gross hourly earnings in factories rose from $0.633 in 1939 to $1.019 in 1944; the straight-time average rose from $0.622 to $0.947. Another factor that appears to have had greater recent effect than in World War I is the relatively large increase in employment in war industries, such as shipbuilding and aircraft, with comparatively high

wage rates. When the effects of interindustry shifts in employment are excluded, straight-time hourly earnings averaged, in 1944, only $0.869 as compared with the gross average of $1.019. The increase in basic wage rates in manufacturing from 1939 to 1944 appears to have been about 35 percent, as compared with a rise of 61.0 percent in gross hourly earnings.

TABLE 1.—*Average Weekly and Hourly Earnings in Manufacturing, Coal Mining, and Steam Railroads, 1914, 1919, 1939, and 1944*

Industry	Amount				Percent of increase—	
	1914 [1]	1919 [1]	1939	1944	1914–19	1939–44
Average weekly earnings: [2]						
Manufacturing	$11.01	$22.08	$23.86	$46.08	100.5	93.1
Bituminous-coal mining	12.22	25.65	23.88	51.27	109.9	114.7
Anthracite mining	11.40	26.92	25.67	47.93	136.1	86.7
Steam railroads (class I)	13.66	24.84	30.71	45.69	81.8	48.8
Average hourly earnings:						
Manufacturing [3]	.223	.477	.633	1.019	113.9	61.0
Bituminous-coal mining [4]	.358	.759	.886	1.186	112.0	33.9
Anthracite mining	.274	.640	.923	1.178	133.6	27.6
Steam railroads (class I)	.252	.537	.707	.934	113.1	32.1

[1] The sources and methods used in computing the averages were described in Monthly Labor Review, September 1940 (pp. 517–544), but some of the averages there given have been revised.
[2] The wide differences in extent of change in average weekly earnings were caused in part by differences in average weekly hours (table 6).
[3] Changes in average hourly earnings in manufacturing were significantly affected by changes in the proportions of workers in the different industries, as the shift of workers to high-wage industries such as shipbuilding.
[4] The inclusion of travel time in 1944 as compensable time causes an increase of 7 or 8 percent in compensable hours. If it is assumed that travel time was in reality working time before as well as after the adoption of the travel-time rule, that rule caused an increase in average hourly earnings not shown in the table, the percentage increase being affected by the payment of rates for travel time one-third lower than the rates for productive time.

The increases in average weekly earnings during the period from 1914 to 1919 ranged from 81.8 percent for railroad workers to 136.1 percent for anthracite miners. The increases, except for anthracite mining, were smaller than those in hourly earnings. During the period from 1939 to 1944, the weekly earnings of railroad workers rose much less than the earnings of factory workers and miners, a major cause being the much smaller increase in the hours of work of railroad employees. The average workweek of railroad workers, however, was much longer in 1939 than was the usual workweek. In general, the decline in weekly hours from 1914 to 1919 checked the rise in weekly earnings; in contrast, the sharp rise in hours from 1939 to 1944 was a major cause of the upturn in weekly earnings.

Factory average hourly earnings rose 113.9 percent from 1914 to 1919 and only 61.0 percent from 1939 to 1944, whereas the rise in average weekly earnings in the first period was 100.5 percent, and in the second period, 93.1 percent. Weekly earnings in the two periods are not comparable, however, from the point of view of "take home" pay or compensation actually available for current consumption, because of the recent increase in pay-roll deductions. In the First World War these deductions were negligible. The gross weekly earnings of factory workers in June 1944 averaged $46.24, but it is estimated that the "spendable" earnings of a worker earning that amount and having three dependents amounted only to $39.56. The difference is the sum of the estimated deductions for taxes and bonds.

A single worker, earning $46.24, but without dependents, and subject to a higher tax rate, had estimated "spendable" earnings of only $33.79.

There is a striking contrast in the levels of both hourly earnings and weekly earnings during the two periods. General increases in hourly earnings occurred between 1919 and 1939. Average weekly earnings of factory and railroad workers were also somewhat higher in 1939 than in 1919, but the averages of the coal-mining industries declined, although less sharply than did weekly hours in mining (table 6). The much higher level of hourly earnings in 1939 than in 1919 is to be explained largely by the sharp rise in labor productivity. Average output per man-hour in manufacturing industries rose 128 percent; average hourly earnings adjusted by the consumers' price index rose only 69 percent; and unit labor cost fell 44 percent. Large increases in labor productivity occurred also in coal mining and railroad transportation.

UNION HOURLY RATES

The increases in basic rates of wages as embodied in union agreements in the building and printing trades were much smaller during both periods than were the increases in average hourly earnings in manufacturing, mining, and railroads. The average union hourly rate of wages in the building trades rose from $0.481 in 1914 to $0.676 in 1919, or 40.5 percent (table 2). The rise in the printing trades, from a somewhat lower level of $0.449, was 39.9 percent. The increases between 1939 and 1944 were 13.6 percent in the building trades and 13.1 percent in the printing trades. In both periods the increases for helpers and laborers were significantly larger than those for journeymen. In addition, the rise in the average hourly rate for helpers and laborers between 1919 and 1939 was appreciably greater than the rise in the journeymen's rate.

TABLE 2.—*Union Hourly Wage Rates in Building and Printing Trades, 1914, 1919 1939, and 1944* [1]

Trade	Union hourly wage rate				Percent of increase—	
	1914	1919	1939	1944	1914–19	1939–44
All building trades	$0.481	$0.676	$1.303	$1.480	40.5	13.6
Journeymen	.533	.741	1.415	1.590	39.0	12.4
Helpers and laborers	.251	.385	.781	.939	53.4	20.2
All printing trades	.449	.628	1.182	1.337	39.9	13.1
Book and job	.410	.591	1.115	1.251	44.1	12.2
Newspaper	.558	.732	1.308	1.505	31.2	15.1

[1] The average rates for years prior to 1944 are estimates calculated by use of indexes. These indexes were constructed from percentage changes in annual averages which in turn were computed from the quotations of those unions which furnished reports for identical occupations in two consecutive years.

Union hourly wage rates are collected once each year during the spring or summer. Data for 1914 and 1919 are for May 15; for 1939, June 1; and for 1944, July 1.

The averages are straight-time union rates, excluding such compensation as premium payments for overtime.

The average union rate for the newspaper trades was significantly higher in 1914 than the average for the book and job trades ($0.558 as compared with $0.410), but the difference was narrowed by a rise of 44.1 percent in the book and job trades as compared with 31.2 per-

cent in the newspaper trades. The difference was further narrowed between 1919 and 1939. Between 1939 and 1944 the newspaper rate rose slightly more than did the book and job rate, but the increase from 1914 to 1944 was significantly larger in the relatively low book and job rate than in the newspaper rate.

Union hourly rates in the building and printing trades rose less in both wars than the hourly earnings of industrial workers, partly because of the comparatively slight pressure of wartime demands on these trades, especially in printing and publishing. In addition, hourly earnings tended to rise more rapidly than basic rates because of the effects of premium payments for overtime and the shifting of workers to high-wage industries. When the years 1914 and 1939 are compared, it is seen that changes in union rates were not radically different from changes in average hourly earnings. In the building trades the average union rate rose 170.9 percent; in the printing trades, 163.3 percent. These may be compared with the rise of 183.9 percent in hourly earnings in factories, 147.5 percent in bituminous-coal mining, and 180.6 percent in railroad transportation.

FARM WAGE RATES

The data on farm wage rates published by the Bureau of Agricultural Economics of the Department of Agriculture show trends that are strikingly different from those of nonfarm wages. The weighted average rate per month (table 3) rose from $25.13 in 1914 to $51.13 in 1919, an increase of 103.5 percent, roughly comparable to the increase in average hourly earnings and average weekly earnings in manufacturing, mining, and railroads. Thereafter, however, the trends were radically different. Between 1919 and 1939, the general farm wage rate declined about 40 percent, in contrast to general increases in nonfarm wages. Between 1939 and 1944, the farm wage rate rose 155 percent, in contrast to much smaller increases in nonfarm wages. Even with the very much larger increases in World War II, however, the rise in farm wages during the whole of the period from 1914 to 1944 was smaller than the increase in either the weekly or the hourly earnings of industrial workers.

TABLE 3.—*Farm Wage Rates, 1914, 1919, 1939, and 1944* [1]

Type of payment	Farm wage rate				Percent of increase—	
	1914	1919	1939	1944	1914–19	1939–44 [2]
Per month:						
With board	$22.62	$43.29	$27.39	$74.00	91.4	170.2
Without board	29.74	56.63	35.82	85.70	90.4	139.3
Per day:						
With board	1.17	2.54	1.30	3.46	117.1	166.2
Without board	1.43	3.03	1.56	3.93	111.9	151.9
Weighted average rate per month	25.13	51.13	30.56	78.00	103.5	155.2

[1] U. S. Department of Agriculture, Bureau of Agricultural Economics: Farm Wage Rates, Farm Employment, and Related Data (pp. 3, 4); and Farm Labor, current issues.
[2] The extent of the increases appears to have been partly a result of a significant lag in 1939 in farm wage rates.

Thus, the relatively rapid wartime rise in farm wages followed a serious lag. The rise was accompanied by an increase of 28 percent from 1939 to 1944 in agricultural production and by an advance of

88.8 percent in the wholesale prices of farm products, in contrast to an increase of only 25.3 percent in the prices of all commodities other than farm products. Farmers were not merely able to pay much higher wages; they found it necessary to make substantial advances in order to obtain workers in competition with industrial employers. Increases in farm wage rates were facilitated early in the war by exemption from the wage-stabilization program and later by the relatively limited application of controls to farm wages.

AVERAGE ANNUAL SALARY-WAGE

The average annual salary-wage of all nongovernmental nonagricultural employees, on a full-time equivalent basis, according to rough approximations derived from national income and employment data, rose from $753 in 1914 to $1,283 in 1919, an increase of about 70 percent.[2] The increase in the average salary-wage was naturally smaller than were the advances in average weekly earnings of wage earners in manufacturing, coal mining, and railroad transportation. The earnings of large groups of workers, such as those in retail trade and public utilities, are normally much more stable than are those of wage earners in factories, mines, and railroads. It may be assumed also that there was a smaller shift of employment from low-wage to high-wage occupations and industries in employment generally than in mines and railroads and especially in factories.

During the Second World War, the estimated average salary-wage of nongovernmental nonagricultural employees (full-time equivalent basis) rose from $1,338 in 1939 to $2,255 in 1944, or 69 percent.[3] The increase was again, as in World War I, significantly smaller than the rise in the average weekly earnings of industrial wage earners. The causes of the smaller rise in the average salary-wage are similar to those applicable during the First World War, with the additional factor of the comparatively large effects of the increase in hours and in premium payments for overtime on the earnings of workers in factories and mines. The relative stability of salaries and also of wages in many employments is apparent in periods of downturn as well as upturn of the weekly earnings of industrial wage earners.

Consumers' Prices and Wholesale Prices in the Two World Wars

INDEX OF CONSUMERS' PRICES

The consumers' price index for moderate income families in large cities (table 4) rose 72.4 percent between 1914 and 1919, in contrast to a rise of 26.3 percent between 1939 and 1944. The index in both

[2] Estimates of this nature, especially for the period of the First World War, should not be viewed in any sense as exact measures, but only as rough approximations. The averages are derived from estimates of national income and employment published by the National Bureau of Economic Research, in Income in the United States: Its Amount and Distribution (2 volumes), by W. C. Mitchell and others (New York, 1921, 1922), The National Income and Its Purchasing Power, by W. I. King (New York, 1930), and National Income and Its Composition, 1919–1938 (2 volumes), by Simon Kuznets (New York, 1941). Figures for 1914 and 1919 are based on a larger and more dependable volume of data than are the data for the intervening years, because of the existence of an extensive body of census data for the 2 years.

[3] Estimates for 1939 to 1943 were made by the U. S. Department of Commerce in connection with its national income work. The estimate for 1944 is derived from the Department of Commerce figure for 1943 and the 1943–44 percentage change as shown by Social Security Board data. The data of employment and compensation of workers covered by State unemployment-compensation laws and compiled by the Bureau of Employment Security of the Social Security Board indicate a rise of about 7 percent in the average salary-wage from 1943 to 1944. The Bureau of Labor Statistics figures of average weekly earnings in manufacturing and various nonmanufacturing industries show approximately the same average increase. The estimate of the Department of Commerce for all nonagricultural nongovernmental employees, when available, may indicate a slightly different percentage increase.

periods shows average changes in retail prices of selected goods, rents, and services bought by families of wage earners and lower-salaried workers in large cities. The changes in particular localities ranged widely above and below the average change. The index does not measure changes, either necessary or voluntary, in the total amount that families spend for living. Significant changes occurred in the index during the Second World War, especially before the working out of the national stabilization program, but in comparison with World War I, the increases were small.

The changes in consumers' prices as embodied in the various major items ranged widely during both periods. During the First World War, the prices of clothing rose 141.7 percent; housefurnishings, 121.0 percent; and food, 83.1 percent. The largest increase between 1939 and 1944 was the 43.0-percent rise for food, the next largest increase being a rise of 38.1 percent for clothing. The increase in housefurnishings (34.6 percent) was also greater than the average increase. The smallest increase in both periods was in rent, the rise during the First World War being 11.4 percent, and in the later period, 3.7 percent. Next to rent, the smallest increase during both periods was for fuel, electricity, and ice—46.2 percent from 1914 to 1919 and 10.9 percent from 1939 to 1944.

TABLE 4.—*Changes in Consumers' Price Index for Moderate-Income Families in Large Cities, 1914–23 and 1939–44*

Item	Index (1935–39=100)				Percent of increase—	
	1914	1919	1939	1944	1914–19	1939–44
All items	71.8	123.8	99.4	125.5	72.4	26.3
Food	81.8	149.8	95.2	136.1	83.1	43.0
Clothing	69.8	168.7	100.5	138.8	141.7	38.1
Rent	92.2	102.7	104.3	108.2	11.4	3.7
Fuel, electricity, and ice	62.3	91.1	99.0	109.8	46.2	10.9
Housefurnishings	60.7	134.1	101.3	136.4	121.0	34.6
Miscellaneous	51.9	87.6	100.7	121.3	68.8	20.5

The comparative changes in the various items of the consumers' price index during the two wars should be viewed in the light of the changes between the wars. The general index was 19.7 percent lower in 1939 than in 1919 as compared with reductions of 40.4 percent for clothing, 36.4 percent for food, and 24.5 percent for housefurnishings. The indexes of the other items were higher in 1939 than in 1919, the increase for rent being 1.6 percent; for fuel, electricity, and ice, 8.7 percent; and for miscellaneous items, 15.0 percent. The increase from 1914 to 1944 in the general index was 74.8 percent, somewhat larger than the increase of 66.4 percent in the food index and much larger than the 17.4-percent rise in rent. The largest increase was in the index of miscellaneous items (133.7 percent), followed by 124.7 percent for housefurnishings and 98.9 percent for clothing.

Information regarding consumers' prices is much less detailed for the First World War than for more recent periods. The earlier indexes are more satisfactory for food (the major item) and for all items combined than for most of the components other than food.

676568°—46——2

The relative importance of the various major items in the consumers' price index is indicated broadly by the following percentage distribution of family-budget costs in 1935–39:

	Percent
Food	35.4
Clothing	11.0
Rent	18.8
Fuel, electricity, and ice	6.7
Housefurnishings	4.4
Miscellaneous	23.7
All items	100.0

Variations in the extent of price changes in the different items cause variations in percentage distribution of costs in the index. Thus, in December 1943, food accounted for 41.2 percent and rent for 17.2 percent of the total, these changes accompanying the comparatively large increases in food prices.

WHOLESALE PRICES

Wholesale prices rose more than consumers' prices during both World War periods (tables 4 and 5). The rise in wholesale prices from 1914 to 1919 was 103.5 percent, as compared with 72.4 percent in the consumers' price index; and from 1939 to 1944, 34.9 percent, as compared with 26.3 percent in consumers' prices. The wholesale price index, however, fell much more sharply between the two wars (44.4 percent) than did the index of consumers' prices (19.7 percent). The net result of the changes from 1914 to 1939 was a significantly larger increase in consumers' prices than in wholesale prices, the former being 38.4 percent higher than in 1914 and the latter only 13.2 percent higher. Thus, the consumers' price index, although less variable within the period from 1914 to 1939, was at a substantially higher level in 1939 in relation to 1914 than was the index of wholesale prices. Furthermore, although the wholesale price index rose more rapidly during the Second World War than did the index of consumers' prices, the latter was still, in 1944, at a higher level in relation to 1914 than was the former. The largest increase in wholesale prices during both periods of war was in farm products, and the next largest increase was in food. These major groups, farm products and food, underwent relatively large declines during the period 1919–39, but both rose more than all commodities combined in 1914–44.

TABLE 5.—*Changes in Wholesale Prices, 1914–19 and 1939–44*

Item	Index (1926=100)				Percent of increase—	
	1914	1919	1939	1944	1914–19	1939–44
All commodities	68.1	138.6	77.1	104.0	103.5	34.9
All commodities other than farm products	66.8	131.6	79.5	99.6	97.0	25.3
All commodities other than farm products and food	66.4	128.8	81.3	98.5	94.0	21.2
Farm products	71.2	157.6	65.3	123.3	121.3	88.8
Food	64.7	129.5	70.4	104.9	100.2	49.0

Hours of Work in the Two World Wars

AVERAGE WEEKLY HOURS

Average weekly hours in major employments declined from 1914 to 1919, in contrast to sharp increases from 1939 to 1944 (table 6). The average weekly hours of factory workers fell from 49.4 in 1914 to 46.3 in 1919, a reduction of 6.3 percent. The hours of employees of class I steam railroads fell from 54.1 to 46.3 per week, a decline of 14.4 percent. The evidence indicates nominal increases in the average hours of workers in bituminous-coal and anthracite mining.

The decline in average hours between 1914 and 1919 was caused by the shortening of work schedules. Some increases in average hours in World War II resulted from reductions in amount of part-time work, but a major factor was the lengthening of work schedules. The workweek in 1914 was so long that the general movement for reductions in hours was reinforced by arguments for increasing efficiency in war production. Reductions in scheduled hours had been so extensive by 1939 that the temporary lengthening of the workweek as an emergency measure encountered little opposition.

TABLE 6.—*Average Weekly Hours in Manufacturing, Coal Mining, and Steam Railroads, 1914, 1919, 1939, and 1944*

Industry	Average weekly hours				Percent of change—	
	1914 [1]	1919 [1]	1939	1944	1914–19	1939–44
Manufacturing	49.4	46.3	37.7	45.2	−6.3	+19.9
Bituminous-coal mining [2]	35.2	35.5	27.1	43.4	+.9	+60.1
Anthracite mining	41.6	42.1	27.7	40.7	+1.2	+46.9
Steam railroads (class I)	54.1	46.3	43.5	48.9	−14.4	+12.4

[1] The sources and methods used in computing the averages were described in Monthly Labor Review, September 1940 (pp. 517–544), but the averages there given have been revised.

[2] Average weekly hours in bituminous-coal mining for 1944 were computed from figures of man-hours which include travel time in the mines. The figures of man-hours used for the earlier years exclude travel time. The inclusion of travel time of underground workers raises the general average by 7 or 8 percent.

Starting in 1939 from a much lower level (37.7 hours as compared with 49.4 hours in 1914), the average hours of factory workers rose by 1944 to 45.2 hours, only a little below the 1919 average of 46.3 hours. The increase in the hours of railroad workers was only 12.4 percent, as compared with 19.9 percent for factory workers, but the level of railroad hours throughout both periods was comparatively high.[4]

The relatively low levels of hours in coal mining were caused largely, before the wartime emergency, by part-time operation of the mines. Data compiled by the U. S. Bureau of Mines indicate that the number of days of operation of bituminous-coal mines averaged only 195 in both 1914 and 1919 and only 178 in 1939. The averages for anthracite mining were 245 in 1914, 266 in 1919, and 183 in 1939. Hours in coal mining are also affected by the hazardous and exhausting nature of the work. Before 1944, travel time in the mine was not included. Collective agreements provided for its inclusion in 1944 in bituminous-

[4] The averages for railroad workers (table 6) are not wholly comparable to those for factory workers. The main difference is caused by the inclusion in railroad data of time credited to road train and engine men under the mileage or incentive basis of pay, some of which is not time actually on duty.

coal mining and in 1945, after the expiration of the old agreement, in anthracite mining. The new agreements, providing for portal-to-portal time as compensable time, recognized that travel time in the mine is in reality time on duty, under the control of employers. The ratio of travel time to "productive" time, when all workers are included, has varied with the relative number of underground workers, the depth of the mines, and the nature of the facilities for reaching the "face" or usual place of work in the mine. Rough comparability of the averages is attainable, however, by raising the earlier averages by 7 or 8 percent.

UNION HOURS IN BUILDING AND PRINTING TRADES

Comparable hours data are available for the periods of the two World Wars from union agreements in the building and printing trades. The hours as specified in these agreements are straight-time hours for a full workweek. The averages therefore differ both from scheduled hours and from average hours as affected by such factors as labor turn-over, part time, and overtime. (See table 7.)

TABLE 7.—*Union Weekly Hours in Building and Printing Trades, 1914, 1919, 1939, and 1944* [1]

Trade	Union weekly hours				Percent of change—	
	1914	1919	1939	1944	1914–19	1939–44
All building trades	46.4	45.6	39.4	39.9	−1.7	+1.3
Journeymen	45.8	45.1	38.9	39.8	−1.5	+2.3
Helpers and laborers	48.0	47.0	40.8	40.0	−2.1	−2.0
All printing trades	49.5	49.5	39.0	39.0	0	0
Book and job	51.0	51.0	39.7	39.7	0	0
Newspaper	44.9	44.9	37.8	37.5	0	−.8

[1] The average hours for years prior to 1944 are estimates calculated by use of indexes These indexes were constructed from percentage changes in annual averages which in turn were computed from the quotations of those unions which furnished reports for identical occupations in 2 consecutive years.

Data of union weekly hours are collected once each year during the spring or summer. Data for 1914 and 1919 are for May 15; for 1939, June 1; and for 1944, July 1.

The hours are averages of regularly scheduled straight-time hours under the provisions of union agreements and are not affected by part time or overtime.

The weekly hours of union workers in both the building and printing trades show little change during both wars. Union hours in the building trades declined slightly in the First World War and rose somewhat from 1939 to 1944. The most important change in the union hours of both groups of trades was a decline between the two periods. The union agreements in the building trades indicate a reduction from 45.6 hours in 1919 to 39.4 hours in 1939, a decline of 13.6 percent. The reduction in the printing trades was larger, the average falling from 49.5 hours in 1919 to 39.0 hours in 1939, or 21.2 percent. The average hours actually worked by members of unions are not available, but it is apparent that the hours as embodied in union agreements represent neither the levels nor the trends of average weekly hours. The average for all wage earners in private building construction was 32.4 hours per week in 1939 and 39.5 hours in 1944. These averages reflect the comparative instability of employment in the building trades. The averages for all wage earners in printing, publishing, and allied industries indicate much greater

stability of employment and a much smaller effect of such factors as part time, overtime, and labor turn-over. The average for 1939 was 37.4 hours per week, and that for 1944 was 41.0 hours. Comparable figures for the period of the First World War are not available.

FULL-TIME OR SCHEDULED HOURS

Changes in average weekly hours reflect the combined effects of changes in scheduled or normal hours of shifts or plant operation and of such additional factors as part time, overtime, and labor turn-over. The Bureau of the Census collected data relating to prevailing hours of the full-time scheduled workweek of wage earners in manufacturing industries for the years 1914 and 1919. These figures indicate a decline from 55.1 hours in 1914 to 50.8 hours in 1919. The curtailment of the regular or full-time workweek is indicated also by the following tabulation,[5] computed from data of the U. S. Census of Manufactures:

Scheduled workweek of—	*Percent of wage earners in plants with specified workweek, in—* 1914	1919
Under 48 hours	11.8	16.1
48 hours		32.6
Over 48 and under 54 hours	13.5	16.5
54 hours	25.8	9.0
Over 54 hours and under 60 hours	22.0	13.8
60 hours	21.1	9.0
Over 60 hours and under 72 hours	3.5	3.0
72 hours	1.5	
Over 72 hours	.8	
Total	100.0	100.0

Statistical records of hours of work in World War II emphasize average hours as affected not only by work schedules but also by such factors as labor turn-over, part time, and overtime. The concept of straight-time hours as distinguished from hours for which premium payments are made acquired increasing importance because of the enactment of the Fair Labor Standards Act and the general inclusion in collective agreements of provisions for premium payments for overtime. The usual provision in collective agreements called for premium payments after 40 hours, but there were many departures from this rule, as in coal mining, railroad transportation, and some of the apparel trades.

Scheduled hours of work in the Second World War rose rapidly. The majority of wage earners in more than half of 31 selected war industries were working, as early as October 1942, in plants with a scheduled workweek of at least 48 hours.[6] Among these war industries, the continuous-process industries, such as blast furnaces, steel works and rolling mills, had kept as a rule the 40-hour week but later adopted the 48-hour week under the provisions of an Executive order of February 9, 1943. This order and the ensuing regulations issued by the War Manpower Commission called for the extension of the 48-hour week not only to war industries but also to all other employments in areas of critical labor shortage.

[5] Monthly Labor Review, April 1944 (pp. 838–855). (Reprinted as Serial No R 1635.)
[6] Hours of Work in Selected War Industries, October 1942 (U. S. Bureau of Labor Statistics, Washington, 1942).

Part 2.—War and Postwar Trends

Summary

The comparisons of changes in wages, prices, and hours of work in Part 1 of this report were limited to the periods 1914–19 and 1939–44, which covered broadly similar conditions of the impact of war on the United States and of preparation for war or actual warfare by the United States. Part 2 describes in more detail the changes that occurred during World War I and the years of transition to comparative stability in the twenties and also compares briefly the conditions affecting trends after the two wars.

Weekly earnings of factory workers rose steadily from early 1916 to the end of the war. The net result of the sharp postwar fluctuations was a rise by 1923 to a level slightly above the war-end averages and 116 percent above the 1914 level. The postwar rise in factory hourly earnings was followed by a decline and a later recovery of part of the loss, the average in 1923 being 134 percent higher than in 1914. Other measures of wages, such as union hourly rates and farm rates, show a wide diversity in levels and in extent of change, but they indicate a rough consistency with the variations in factory earnings from 1914 to 1923.

Prices were more variable than were wages from 1914 to 1923, but the net advances in both consumers' prices and wholesale prices were smaller than the increases in most of the measures of wages. The index of consumers' prices (formerly called the index of cost of living) was 69.8 percent higher in 1923 than in 1914; the wholesale price index was only 47.7 percent higher. An economic basis for the larger increase in wages than in prices was the rise in labor productivity.

The average weekly hours of factory workers declined between 1914 and 1919, largely because of reductions in scheduled hours. Further reductions, caused mainly by part time, occurred during the business depression of the early twenties, but comparative stability was attained by 1923 at approximately the 1919 level. Reductions occurred in some industries by 1923, especially in blast furnaces and steel mills, but these were substantially counterbalanced by postwar increases in other industries.

Conditions affecting wages, prices, and hours of work at the end of World War II differed significantly from those of the period immediately following the First World War. Major differences related to the degree of control of prices, rationing and reconversion, the trends of hours of work, the extent of unionization, the comparative progress of technology as a basis of controlling production costs, and the shifting of emphasis to the roles of demand, consumption, and full use of income in maintaining adequate production and employment.[1]

[1] These conditions are necessarily subject to unforeseeable changes, as, for example, in public policies.

Wages, 1914–23

Information regarding monthly changes in wages during the First World War is fragmentary. The major monthly series relates to average weekly earnings in manufacturing industries. Annual averages of hourly earnings for certain years are available for several major fields of employment. Wage-rate data include workers in coal mining, the building and printing trades, marine transportation, and agriculture.

AVERAGE WEEKLY EARNINGS IN MANUFACTURING

Average weekly earnings in manufacturing on a monthly basis are available beginning in June 1914 (table 1).

TABLE 1.—*Average Weekly Earnings of Wage Earners in Manufacturing, 1914–23* [1]

Month	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923
	Average weekly earnings									
January	-------	$10.97	$11.36	$13.61	$15.72	$21.59	$25.03	$24.38	$20.30	$22.52
February	-------	10.94	12.28	13.69	15.87	21.20	24.91	23.55	20.63	22.96
March	-------	11.15	12.49	14.30	17.27	21.27	26.09	23.49	20.85	23.57
April	-------	11.06	12.49	13.77	17.62	21.03	25.79	23.03	20.65	23.75
May	-------	11.23	12.94	15.02	18.91	21.12	26.61	22.68	21.04	24.51
June	$11.20	11.29	12.96	15.12	18.97	21.46	27.18	22.38	21.47	24.36
July	11.06	11.16	12.14	14.60	19.41	21.56	26.84	21.61	21.30	23.64
August	11.05	11.36	12.63	15.18	20.98	22.36	26.98	21.83	21.72	23.65
September	11.00	11.34	12.88	15.33	21.30	22.94	26.95	21.22	21.99	23.70
October	10.81	11.73	13.24	16.56	22.57	22.46	26.94	20.67	22.09	24.48
November	10.86	11.82	13.79	17.25	20.94	23.12	26.41	20.38	22.63	24.30
December	11.07	12.06	14.07	17.09	22.35	24.35	26.08	21.11	22.92	24.41
Average for year	11.01	11.34	12.77	15.13	19.33	22.08	26.30	22.18	21.51	23.82
	Indexes (average 1914=100)									
January	-------	99.6	103.2	123.6	142.8	196.1	227.3	221.4	184.4	204.5
February	-------	99.4	111.5	124.3	144.1	192.6	226.2	213.9	187.4	208.5
March	-------	101.3	113.4	129.9	156.9	193.2	237.0	213.4	189.4	214.1
April	-------	100.5	113.4	125.1	160.0	191.0	234.2	209.2	187.6	215.7
May	-------	102.0	117.5	136.4	171.8	191.8	241.7	206.0	191.1	222.6
June	101.7	102.5	117.7	137.3	172.3	194.8	246.9	203.3	195.0	221.3
July	100.5	101.4	110.3	132.6	176.3	195.8	243.8	196.3	193.5	214.7
August	100.4	103.2	114.7	137.9	190.6	203.1	245.0	198.3	197.3	214.8
September	99.9	103.0	117.0	139.2	193.5	208.4	244.8	192.7	199.7	215.3
October	98.2	106.5	120.3	150.4	205.0	204.0	244.7	187.7	200.6	222.3
November	98.6	107.4	125.2	156.7	190.2	210.0	239.9	185.1	205.5	220.7
December	100.5	109.5	127.8	155.2	203.0	221.2	236.9	191.7	208.2	221.7
Average for year	100.0	103.0	116.0	137.4	175.6	200.5	238.9	201.5	195.4	216.3

[1] A series of average weekly earnings from January 1919 to December 1923 was derived by dividing total weekly pay rolls by total employment. (Bureau of Labor Statistics mimeographed release, January 1941, giving revised estimates after the exclusion of railroad repair shops from manufacturing industries.) Average weekly earnings from June 1914 to December 1918 were calculated as follows: Index numbers of average weekly earnings from November 1915 to January 1919 were derived by dividing indexes of pay rolls by indexes of employment. (Monthly Labor Review, August 1925, p. 115.) These index numbers were then used to extend the average weekly earnings back to November 1915, linking at January 1919. For months prior to November 1915, the average weekly earnings for New York State (New York State Department of Labor, Industrial Bulletin, vol. 2, p. 221) were linked to the Bureau of Labor Statistics series by means of the ratio of the averages for the 12 months ending October 1916.

The Bureau of Labor Statistics indexes of employment and pay rolls for the earlier period (November 1915 to January 1919) when taken separately appear to have serious biases but the index derived by dividing the index of pay rolls by the index of employment indicates the approximate trend of average weekly earnings for this period. Any appreciable error in the trend would have resulted in a bias in the estimated averages for the earlier years. It is found, however, that the average for 1914, calculated as described above, is almost identical with the average derived by use of the Census of Manufactures revised data of employment and pay rolls from which railroad repair shops have been excluded.

It will be noted that no significant changes in factory average weekly earnings occurred before 1916. The rise early in 1916 continued virtually without interruption through 1918. Earnings in the first part of 1919 were substantially stabilized but the rise was resumed during the latter part of the year, the high point being reached in 1920. The ensuing decline extended into 1922. The upturn beginning in the spring of 1922 raised the averages in 1923 to the levels which may be viewed as bringing to an end the period of postwar readjustment, the averages ranging around $24 per week as compared with less than $12 per week in 1914 and in most of 1915.

The changes in average weekly earnings were caused mainly by changes in basic rates of wages but by 1919 the reduction of average weekly hours counteracted in part the rise in rates. The period of the war was marked by a comparatively large increase in employment in war industries, largely in the heavy-goods industries, which paid comparatively high wages. The transition to peace was accompanied by a shift of employment in the opposite direction.

AVERAGE HOURLY EARNINGS IN MANUFACTURING

Estimated average hourly earnings in manufacturing rose from $0.233 in 1914 to $0.477 in 1919 (table 2). Quarterly data extending from the first quarter of 1920 to the first quarter of 1922 indicate a continued rise in 1920 to $0.564 in the fourth quarter of that year. This rise was followed by a decline to $0.482 in the first quarter of 1922. The ensuing upturn raised the average for 1923 to $0.522.

TABLE 2.—*Average Hourly Earnings in Manufacturing, 1914–23* [1]

Year and quarter	Average hourly earnings	Year and quarter	Average hourly earnings
1914: Year	$0.223	1921: First quarter	$0.537
1919: Year	.477	Second quarter	.519
1920: First quarter	.546	Third quarter	.510
Second quarter	.555	Fourth quarter	.491
Third quarter	.555	1922: First quarter	.482
Fourth quarter	.564	1923: Year	.522

[1] For the years 1914, 1919, and 1923, data are revisions of average hourly earnings of wage earners published by Bureau of Labor Statistics in Monthly Labor Review, September 1940, pp. 517–544 (reprinted as Serial No. R. 1150). Quarterly data for the years 1920 to 1922 are interpolations based on the trend of average hourly earnings of all employees as shown in Table LVII (p. 113) in Employment, Hours, and Earnings in Prosperity and Depression, United States, 1920–22, by W. I. King (National Bureau of Economic Research, New York, 1923). The information on manufacturing used in this volume was collected by a cooperative arrangement between the Bureau of the Census, the President's Conference on Unemployment, and the National Bureau of Economic Research.

Information regarding hourly earnings during the years 1915 to 1918 is fragmentary but inferences may be drawn from trends of average weekly earnings and average weekly hours. Scheduled hours of work were reduced in many important branches of employment but the reductions were accompanied, especially after 1915, by increased production and demand for workers, and part time seems, therefore, to have been reduced, while at the same time the amount of overtime increased. The probable result of these counterbalancing factors was no significant change, from 1914 to 1918, in the average number of weekly hours actually worked. It may, in consequence, be assumed that up to 1918 average hourly earnings followed substantially the trend of average weekly earnings.

AVERAGE HOURLY AND WEEKLY EARNINGS IN MANUFACTURING, COAL MINING, AND RAILROADS

Average hourly earnings and average weekly earnings have been estimated for the years 1914, 1919, and 1923 for manufacturing, anthracite mining, bituminous-coal mining, and class I steam railroads (table 3). For comparative purposes, the annual averages for manufacturing given above (tables 1 and 2) are included with those for mining and railroads in table 3. The average hourly earnings of coal miners are for hours of work at the face or usual place of work, excluding travel time in the mine. The hourly earnings of railroad workers are for hours paid for, not hours on duty, the number of hours paid for but not on duty being chiefly important for employees in road train and engine service.

TABLE 3.—*Average Hourly and Weekly Earnings of Wage Earners in Manufacturing, Coal Mining, and Class I Steam Railroads, 1914, 1919, and 1923* [1]

Industry	Average hourly earnings			Average weekly earnings		
	1914	1919	1923	1914	1919	1923
Manufacturing	$0.223	$0.477	$0.522	$11.01	$22.08	$23.82
Anthracite mining	.274	.640	.791	11.41	26.95	34.22
Bituminous-coal mining	.358	.759	.845	12.22	25.65	25.60
Class I steam railroads	.252	.537	.581	13.66	24.84	26.42

[1] A revision and extension of data in Monthly Labor Review, September 1940 (pp. 523–534).

Average hourly earnings more than doubled between 1914 and 1919 in manufacturing as a whole, the coal-mining industries, and steam railroads. There was a further rise in hourly earnings between 1919 and 1923 in all of these branches of employment. The increases in average weekly earnings, with the exception of anthracite mining, were somewhat smaller than the increases in average hourly earnings, primarily because of reductions in average hours of work.

The increases in the average hourly earnings of the major groups of industrial wage earners were substantially larger than the rise in either the consumers' price index for moderate-income families in large cities or the wholesale price index. An economic basis of the advances in hourly earnings was the substantial increase in average man-hour output. Labor productivity in manufacturing underwent little change during the war but rose sharply after 1919. The real hourly earnings of factory workers (average hourly earnings adjusted by the consumers' price index) rose about 11 percent from 1919 to 1923, in contrast to an increase of about 31 percent in average man-hour output. Later in the twenties hourly earnings and consumers' prices both underwent little change, in contrast to a continued sharp increase in average man-hour output.

AVERAGE HOURLY EARNINGS IN SELECTED MANUFACTURING INDUSTRIES

Changes in average hourly earnings may be traced in some detail for various industries from special surveys made during the First World War and the early years of peace. These industries include

cotton goods, woolen goods, silk, hosiery and underwear, men's clothing, boots and shoes, and furniture (table 4), and blast furnaces, steel works, and rolling mills, formerly described as the iron and steel industry (table 5).

TABLE 4.—*Average Hourly Earnings in Specified Manufacturing Industries, 1913–24* [1]

Year [2]	Cotton goods	Woolen and worsted goods	Silk	Hosiery and underwear	Men's clothing	Boots and shoes	Furniture
1913							$0.220
1914	$0.153	$0.182	$0.202	$0.172	$0.256	$0.243	
1915							.227
1916	.179	.225				.259	
1917							
1918	.267	.342				.336	
1919			.384	.315	.446		.337
1920	.480	.628				.559	
1921							
1922	.330	.474		.354	.728	.501	
1923							
1924	.372	.533		.409	.760	.516	

[1] Data are the results of special surveys, published in Bureau of Labor Statistics bulletins, as follows: Cotton goods, Bull. No. 446 (p. 6); woolen and worsted goods, Bull. No. 443 (p. 7); silk, Bull. No. 568 (p. 2); hosiery and underwear, Bull. No. 452 (p. 9) and Bull. No. 265 (pp. 37, 38); men's clothing, Bull. No. 387 (p. 8); boots and shoes, Bull. No. 450 (p. 2); furniture, Bull. No. 526 (p. 2), and Bull. No. 265 (pp. 37, 38). The averages for men's clothing are not representative of the industry as a whole because of an overrepresentation of larger northern cities.

[2] It should be noted that the special surveys did not cover the whole of the years indicated. They were limited to certain months or periods, as May for the 1914 cotton-goods survey and January to April for the 1924 survey of the boot and shoe industry. In a period of rapid changes in rates of wages, a limited period, especially if near the beginning or the end of the year, cannot be viewed as representative of the year.

The averages for 1914 and 1924 show not only a wide range among the industries in levels of hourly earnings but also significant divergences in the trends. The averages in 1914 ranged from $0.153 in the cotton-goods industry to $0.301 in blast furnaces, steel works, and rolling mills. The increases between 1914 and 1924 ranged from 112 percent in boots and shoes to 197 percent in men's clothing. The increase in blast furances, steel works, and rolling mills was 114 percent. The rise in all manufacturing industries combined during the same period was 145 percent.

The special surveys from which the averages of tables 4 and 5 were derived were made primarily for the purpose of analyzing the occupational wage structures of the several industries as they existed when the surveys were made. Studies of different industries were made in different periods of the year. During the war and the years immediately following, there were rapid changes in wages, and the averages as shown are not to be viewed as annual averages or as strictly comparable for the several industries. The years 1914 and 1924, however, were years of comparative stability in the wage structure, and the averages for these two years are therefore comparable, as are the percentages of change from 1914 to 1924.

The study of blast furnaces, steel works, and rolling mills by the Bureau of Labor Statistics in October 1920 was made when wages in that industry were near their peak (table 5). Hourly earnings at that time averaged $0.745, as compared with $0.301 in May 1914, the increase being 148 percent. The sharp downturn of 31 percent in the average hourly earnings of these workers between October 1920

and October 1922 was significantly greater than the general decline in hourly earnings. The rise to $0.644 in January 1924 was accompanied by reductions in the scheduled or full-time hours of work from 63.2 hours per week in October 1922 to 55.2 hours in January 1924.

The average hourly earnings of common laborers in blast furnaces, steel works, and rolling mills rose from $0.181 in May 1914 to $0.508 in October 1920, an increase of 181 percent as compared with the rise of 148 percent in the average hourly earnings of all workers in this industry. The earnings of laborers, however, fell somewhat more than did the general average between October 1920 and October 1922, and rose somewhat less from October 1922 to January 1924. The increase from May 1914 to January 1924 was 114 percent for all workers and 130 percent for common laborers.

TABLE 5.—*Average Hourly Earnings in Blast Furnaces, Steel Works, and Rolling Mills, 1914–24* [1]

Department	1914 (May)	1915 (May)	1917 (September)	1918–1919 (October 1918 to May 1919)	1920 (October)	1922 (October)	1924 (January)
	All occupations						
All departments	$0.301	$0.297			$0.745	$0.513	$0.644
Blast furnaces	.206	.207			.571	.398	.520
Bessemer converters	.255	.264			.677	.470	.624
Open-hearth furnaces	.237	.246			.671	.480	.635
Puddling mills	.328	.315			.885	.496	.721
Blooming mills	.269	.268			.659	.472	.613
Plate mills	.258	.270			.671	.476	.562
Bar mills	.278	.266			.713	.486	.585
Standard-rail mills	.252	.246			.632	.470	.573
Sheet mills	.488	.450			1.039	.694	.809
Tin-plate mills	.425	.428			.949	.650	.795
	Common laborers						
All departments	$0.181	$0.180	$0.298	$0.461	$0.508	$0.336	$0.417
Blast furnaces	.177	.171	.281	.457	.474	.315	.401
Bessemer converters	.193	.193	.298	.489	.537	.363	.448
Open-hearth furnaces	.185	.186	.292	.468	.525	.354	.434
Puddling mills	.173	.167		.436	.457	.305	.355
Blooming mills	.187	.187	.287	.469	.511	.350	.462
Plate mills	.174	.174	.294	.450	.498	.336	.432
Standard-rail mills							.385
Bar mills	.173	.173		.443	.506	.316	.392
Sheet mills	.188	.188	.331	.462	.536	.356	.420
Tin-plate mills	.189	.190		.461	.533	.359	.436

[1] Bureau of Labor Statistics Bulletin No. 442 (pp. 3, 4, 13); Monthly Labor Review, March 1918 (pp. 29–51). The figures are not annual averages but are limited to the periods indicated. The earnings of laborers in rail mills, although not shown separately except for 1924, are included in the averages for all years except 1917. The comparatively small coverage for 1917 may affect slightly the average for that year.

AVERAGE HOURLY EARNINGS OF RAILROAD WORKERS

The average hourly earnings of railroad wage-earning groups (including clerical employees) were given above (table 3) for certain years. Average hourly earnings of all workers, including salaried employees, are available for each of the years from 1915 to 1923, as shown in the following tabulation.

	Railroad average hourly earnings [1]
1915 (year ended June 30)	$0.269
1916 (year ended June 30)	.276
1916 (calendar year)	.283
1917	.320
1918	.458
1919	.565
1920	.676
1921	.677
1922	.629
1923	.627

[1] Sources: Interstate Commerce Commission. For the years 1915 to 1920, data are from the 1919 and 1924 volumes of Statistics of Railways in the United States. For the years 1920 to 1923, the data as published were based, except for certain occupations, on time paid for. The averages for these years have been recalculated from figures of total time worked or on duty and total compensation as given in Statistics of Railways, 1921, p. XXIII, and in Wage Statistics for the last 6 months of 1921 and for the years 1922 and 1923. These averages are higher than those in table 3 mainly because of the inclusion of salaried employees and to a slight extent because of the use of hours on duty as distinguished from hours paid for.

On the basis of data compiled by the Interstate Commerce Commission, with certain adjustments for comparability of the data for different years, the hourly earnings of all railroad workers during the year ended June 30, 1915, averaged $0.269. Small increases occurred up to the end of 1917, the average for the calender year 1917 being $0.320. The efforts of labor organizations, combined with the recommendations of public agencies, notably the Lane Commission appointed to investigate railroad wages, resulted in sharp increases to $0.458 in 1918. Further advances raised the average to $0.565 in 1919 and to $0.676 in 1920. Basic wage rates remained unchanged in 1921 but readjustments of rates reduced average earnings by 1923 to $0.627.

UNION WAGE RATES IN BITUMINOUS-COAL MINING

Tonnage workers in coal mining, although declining in relative numbers as a result of mechanization, still form a significant part of total employment. Tonnage and other piece rates vary widely with the nature of coal veins, the type of work, the extent of mechanization, and other conditions. One of the basic aims of union policy, however, has been the maintenance of an equitable relationship between tonnage rates and the rates of day workers. Changes in the rates of day workers may, therefore, be viewed as indicating broadly the general trends of wage rates in coal mining.

The trends of the wage rates of day workers are indicated by changes in the rates of a comparatively few occupations. The rate of brakemen inside the mines (a group of workers with rates the same as those of several other occupational groups) was $2.84 in the Hocking Valley district during the wage-agreement period extending from April 1, 1912, to March 31, 1916, and the rate rose to $7.50 in August 1920 (table 6). Similar changes occurred in the wage rates of other occupations. Thus, the rate per day of inside laborers and that of outside dumpers and trimmers rose from $2.36 to $7.25.

The Hocking Valley district of Ohio was formerly viewed by operators and miners as the basic-scale field for the determination of union rates in the surrounding districts of Ohio, in the Danville district of

Illinois, in Indiana, and in western Pennsylvania. The rates given in table 6, although a significant measure of the levels and trends of union rates, are not to be interpreted as representative of all rates. Some of the unionized areas had independent rate scales and some mining areas were not unionized. The percentage changes in basic day rates naturally differ from the percentage change in the average hourly earnings of all bituminous-coal miners (table 3) because of the numerous factors, such as tonnage rates, labor productivity, and the changing composition of employment, that effected the changes in average hourly earnings.

TABLE 6.—*Union Rates Per Day in Selected Occupations in the Bituminous-Coal Industry of the Hocking Valley District, 1908–23* [1]

Period of wage agreement	Rate per day				
	Inside work			Outside work	
	Laborers	Brakemen	Trappers (boys)	Carpenters	Dumpers and trimmers
April 1, 1908, to March 31, 1910	$2.360	$2.560	$1.130	$2.530	$2.360
April 1, 1910, to March 31, 1912	2.490	2.700	1.250	2.670	2.490
April 1, 1912, to March 31, 1914	2.620	2.840	1.320	2.810	2.620
April 1, 1914, to March 31, 1916	2.620	2.840	1.320	2.810	2.620
April 1, 1916, to April 15, 1917	2.750	2.980	1.400	2.950	2.750
April 16, 1917, to October 31, 1917	3.350	3.600	1.900	3.550	3.350
November 1, 1917, to March 31, 1918	4.750	5.000	2.650	4.950	4.750
April 1, 1918, to November 30, 1919	4.750	5.000	2.650	4.950	4.750
December 1, 1919, to March 31, 1920	5.420	5.700	3.020	5.640	5.420
April 1, 1920, to August 15, 1920	5.750	6.000	3.180	5.950	5.750
August 16, 1920, to March 31, 1922	7.250	7.500	4.000	7.450	7.250
April 1, 1922, to March 31, 1923	7.250	7.500	4.000	7.450	7.250
April 1, 1923, to March 31, 1924	7.250	7.500	4.000	7.450	7.250

[1] Bureau of Labor Statistics Bulletin No. 601; Wages and Hours of Labor in Bituminous-Coal Mining, 1933. The Hocking Valley district of Ohio was formerly viewed by operators and miners "as the basic-scale field, not only for the surrounding districts in Ohio, but also for the Danville district of Illinois, for Indiana, and for western Pennsylvania." Brakemen's rates were the same as the rates of various other occupational groups. More than half of the workers were piece-rate workers, with rates dependent on the type of work, extent of mechanization, etc., but a general aim in wage adjustments was the maintenance of established differentials between the earnings of tonnage workers and day workers.

CHANGES IN UNION HOURLY WAGE RATES IN BUILDING AND PRINTING TRADES

Union hourly wage rates in the building and printing trades from 1914 to 1923 reflect the changes in basic rates of wages in important segments of the national economy during a period when building construction and printing and publishing were subordinated to the more urgent requirements of wartime production. The wage rates embodied in union agreements naturally differ as to levels and probably also in some degree as to trends from the wage rates of unorganized workers. The union rates do not include rates for overtime work. An outstanding characteristic of union rates in the building and printing trades (table 7) is their comparative stability. The averages were computed from indexes, which were constructed for the purpose of eliminating the effects of variations in the samples covered from year to year.

The rates of building-trades journeymen rose only 39 percent between May 1914 and May 1919, in contrast to a rise of 53 percent in the rates of helpers and laborers. The rates of journeymen also rose less than did those of helpers and laborers between 1919 and 1920. The changes between 1920 and 1923 were somewhat more favorable

to journeymen than to helpers and laborers, but the increase for the entire period from 1914 to 1923 was 117 percent for helpers and laborers in contrast to a rise of only 97 percent for journeymen.

Reductions in the union rates of building-trades workers occurred between 1921 and 1922, but printing trades advanced throughout the period. The increases in union building-trades rates during the period as a whole were smaller than the advances in the hourly earnings of industrial workers generally (table 3), but union building-trades rates continued to rise sharply after 1923. The increase between 1923 and 1930 was 31 percent, as compared with only 6 percent in average hourly earnings in manufacturing industries as a whole.

Union rates of the book and job printing trades showed a significantly larger increase than did rates of the newspaper trades. The average for the book and job trades rose 116 percent from 1914 to 1923, in contrast to an increase of only 78 percent for the newspaper trades. The average rates for both the book and job and the newspaper trades continued to rise throughout the period of the war and the transition to peace from 1914 to 1923. The increases during the period as a whole were smaller than the increase in average hourly earnings of factory workers as a whole, but, as with building-trades rates, the increases from 1923 to 1930 were larger than the rise in average hourly earnings in manufacturing.

TABLE 7.—*Union Hourly Wage Rates in Building and Printing Trades, 1914–23* [1]

Year	Union hourly wage rates					
	Building trades			Printing trades		
	All trades	Journeymen	Helpers and laborers	All printing	Book and job	Newspaper
1914	$0.481	$0.533	$0.251	$0.449	$0.410	$0.558
1915	.485	.538	.253	.452	.411	.562
1916	.500	.556	.261	.456	.418	.565
1917	.532	.587	.287	.472	.433	.579
1918	.590	.649	.333	.513	.479	.607
1919	.676	.741	.385	.628	.591	.732
1920	.912	.992	.558	.805	.770	.896
1921	.929	1.010	.564	.882	.848	.974
1922	.872	.952	.513	.891	.852	.983
1923	.963	1.050	.544	.919	.885	.994

[1] The average hourly rates were calculated by use of indexes applied to the 1944 levels of wage rates. These indexes were constructed from percentage changes in annual averages which in turn were computed from the quotations of those unions which furnished reports for identical occupations in 2 consecutive years. Data of union hourly wage rates are collected once each year during the spring or summer. The indexes for the years 1914 to 1923 are based on reports for May 15. The averages are straight-time union rates, excluding overtime and other special rates.

MONTHLY WAGES OF MARITIME WORKERS

Wartime and postwar changes in the monthly wages of two groups of maritime workers—able seamen and firemen—are broadly indicative of changes in this field of employment. The data shown for the period from 1914 to 1918, for 1922, and for 1924 (table 8) are not wholly comparable in coverage, and maritime wages, which are in addition to the equivalent of board and lodging, cannot be compared with industrial wages. The figures are nevertheless significant as indicating the general nature of the changes in the wages of maritime workers.

TABLE 8.—*Monthly Wages of Able Seamen and Firemen, 1914–24*

Fiscal year ended—	Vessels sailing from New York and San Francisco, 1914–18 [1]						
	Sailing from New York				Sailing from San Francisco		
	Trans-Atlantic	Atlantic and Gulf coastwise	To West Indies and Gulf of Mexico	To South America	Trans-Pacific	Pacific-Atlantic coastwise	Pacific coastwise
	Able seamen						
June 30, 1914	$27.50	$30.00	$30.00	$27.50	$40.00	$31.00	$47.10
June 30, 1915	27.50	30.00	30.00	27.50	38.43	32.38	47.53
June 30, 1916	35.00	35.00	35.00	35.00	41.88	36.86	50.45
June 30, 1917	45.00	45.00	45.00	45.00	55.20	56.15	55.53
June 30, 1918	60.00	60.00	60.00	60.00	65.00	65.14	66.00
	Firemen						
June 30, 1914	$40.00	$40.00	$40.00	$40.00	$55.00	$38.00	$54.91
June 30, 1915	40.00	40.00	40.00	40.00	53.33	43.35	54.82
June 30, 1916	40.00	40.00	40.00	40.00	52.35	43.84	54.50
June 30, 1917	50.00	50.00	50.00	----------	55.30	55.67	55.61
June 30, 1918	60.00	60.00	60.00	60.00	65.00	65.14	66.00

Employer or operator	American cargo steamships, 1922 [2]					American steam and motor cargo vessels of 5,000 gross tons and over, 1924 [3]		
	Period covered	Able seamen		Firemen		Date	Able seamen	Firemen
		Number of vessels	Wages per month	Number of vessels	Wages per month			
Shipping Board	July 24–Sept. 7, 1922	1	$45.00	1	$47.50	Jan. 1, 1924	$63.00	$65.00
		1	47.50	1	50.00			
		15	55.00	15	57.50			
		4	40.00	4	40.00			
Other	July 31–Aug. 22, 1922	2	42.00	2	45.00			
		1	45.00	1	47.50	do	60.00	63.00
		6	47.50	7	50.00			
		2	50.00	1	55.00			

[1] U. S. Shipping Board, Marine and Dock Industrial Relations Division, Report on Marine and Dock Labor: Work, Wages, and Industrial Relations During the Period of the War (p. 110), by Horace B. Drury. Washington, 1919. Wages shown are the predominant wages.
[2] Monthly Labor Review, February 1923, pp. 132–138 (derived from reports by American Steamship Owners' Association).
[3] Monthly Labor Review, April 1927, p. 85 (derived from Merchant Marine Statistics, 1926, published by U. S. Department of Commerce, Bureau of Navigation).

The wages of workers on vessels sailing from New York and San Francisco for ports in various regions ranged widely in 1914, the lowest monthly wage of able seamen as represented in table 8 being $27.50 and the highest monthly wage being $47.10. The corresponding range of the monthly wages of firemen was from $40 to $55. By June 30, 1918, wages had risen substantially, especially for workers whose wages in 1914 had been comparatively low. The rates for able seamen and firemen on vessels sailing from New York were raised to a uniform level of $60 per month. The monthly rate of both able seamen and firemen was $65 on vessels sailing from San Francisco to trans-Pacific ports, $65.14 on Pacific-Atlantic coastwise vessels from San Francisco, and $66 on Pacific coastwise vessels from San Francisco.

The high degree of uniformity in rates attained by 1918 was broken down after the war, and the wartime levels of wages were seriously lowered. By January 1, 1924, however, a comparative uniformity was again restored at levels of wages similar to those of 1918.

FARM WAGE RATES

The Bureau of Agricultural Economics of the Department of Agriculture obtained wage-rate data of four types for the period of the war and the transition to peace: Rates per month with board and without board, and per day with board and without board (table 9). The Bureau of Agricultural Economics also computes the weighted average rate per month, primarily for the purpose of indicating the general trend as distinguished from the levels of farm wage rates.

Each of the four types of farm wage rates rose steadily from 1914 to 1920. The rate per month with board rose 129 percent, and without board, 120 percent; the rate per day with board rose 155 percent, and without board, 142 percent; and the weighted average rate per month rose 138 percent. The increase in the general rate was somewhat smaller than the advance in average hourly earnings of factory workers and about the same as the rise in average weekly earnings in factories. Sharp declines occurred between 1920 and 1922, the reduction in the weighted average rate being 37 percent. An increase of 12 percent occurred between 1922 and 1923. The rise in the weighted average wage rate from 1914 to 1923 was 67 percent, much smaller than the increases in most of the nonagricultural branches of employment.

TABLE 9.—*Farm Wage Rates, 1914–23* [1]

Year	Farm wage rates				Weighted average rate per month [2]
	Per month		Per day		
	With board	Without board	With board	Without board	
1914	$22.62	$29.74	$1.17	$1.43	$25.13
1915	22.97	30.06	1.18	1.44	25.41
1916	25.17	32.84	1.31	1.58	27.93
1917	31.11	40.52	1.65	1.98	34.79
1918	37.96	48.80	2.15	2.54	43.73
1919	43.29	56.63	2.54	3.03	51.13
1920	51.73	65.40	2.98	3.46	59.88
1921	33.62	44.67	1.77	2.12	38.29
1922	32.75	43.33	1.73	2.07	37.47
1923	37.24	48.25	1.89	2.25	41.87

[1] U. S. Department of Agriculture, Bureau of Agricultural Economics, Farm Wage Rates, Farm Employment, and Related Data (p. 3).
[2] Computed primarily for indicating the general trend rather than the general level.

AVERAGE SALARY-WAGE

Estimates of the average annual salary-wage of all nongovernmental nonagricultural employees (full-time equivalents) for 1914 and 1919 were given in Part 1.[2] The averages for 1919 to 1923 are derived from somewhat more satisfactory data than is the estimate

[2] See p. 6, footnote 3.

for 1914. They are to be viewed, however, not as exact measures but only as rough indications of trends. The estimates are as follows:

1914	$753	1921	$1,378
1919	1,283	1922	1,343
1920	1,513	1923	1,428

The average salary-wage was less variable than were the earnings of industrial workers. The low point for both was 1914 and the high point was 1920; the increase between these years was 101 percent in the average salary-wage and 139 percent in the weekly earnings of factory workers. The period of depression from 1920 to 1922 reduced factory weekly earnings 18 percent as compared with a decline of only 11 percent in the average salary-wage. The average was 90 percent higher in 1923 than in 1914, as compared with a somewhat larger increase of 116 percent in the weekly earnings of factory workers, but the increase from 1919 to 1923 was slightly in favor of the average for all nongovernmental nonagricultural employees.

Thus, the increase in the average salary-wage was smaller and the fluctuations were less extreme than were the changes in average earnings of industrial workers. Salaries were affected to a comparatively small extent by changes alike in basic rates and in hours of work, and also by changes in productivity, especially as these are reflected in piece-rate or incentive systems.

Consumers' Prices and Wholesale Prices, 1914–23

The most important single factor affecting the rise in wages during the period of the First World War and the transition to peace was the general increase in prices (table 10).

The index of consumers' prices for moderate-income families in large cities underwent little change during 1914 and 1915. The upturn beginning late in 1915 continued, however, virtually without interruption until June 1920, when the index number was 108.1 percent higher than in 1914. The decline which began in July 1920 continued until April 1922, when the index was only 66.0 percent above the 1914 level. Thereafter, only minor changes occurred until the end of the decade.

In the index of wholesale prices of all commodities, as in that of consumers' prices, only minor changes occurred until late in 1915. The rise which began in October 1915 was much more rapid than the rise in the consumers' price index. The increase continued until May 1920, when it reached a high point 145.5 percent above the 1914 average. The postwar low point, reached in January 1922, was 34.2 percent above the 1914 level. A new upward movement raised the index by March 1923 to a level 53.5 percent above 1914, but the year-end index number, which was 44.1 percent above 1914, was more nearly characteristic of the price levels of the rest of the decade.

The index of consumers' prices did not reach as high a level as compared with 1914 as did the index of wholesale prices, but the net result of the changes from 1914 to 1923 was a comparatively high level of consumers' prices above the 1914 average. The consumers' price index for the year 1923 was 69.8 percent above the 1914 average; the wholesale price index was only 47.7 percent higher.

TABLE 10.—*Indexes of Consumers' Prices and Wholesale Prices, January 1914 to December 1923*

Month	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923
	Indexes (1914=100) of consumers' prices [1]									
January	100.0	100.7	104.0	116.2	138.9	164.6	192.2	189.6	168.7	167.3
February	99.0	100.1	104.2	118.9	140.5	160.9	194.2	183.4	167.8	166.9
March	98.5	99.3	104.9	119.8	139.7	162.7	196.4	181.9	166.2	167.4
April	97.9	99.9	105.8	124.8	141.1	165.7	201.8	179.7	166.0	168.4
May	98.2	100.3	106.4	127.7	144.0	167.8	205.3	176.3	166.0	168.7
June	98.9	100.6	107.7	128.8	146.8	168.5	208.1	175.3	166.4	169.4
July	99.9	100.6	107.7	127.9	150.1	173.0	207.2	175.5	166.7	171.2
August	101.4	100.7	108.9	129.7	152.8	176.0	201.7	176.3	165.2	170.6
September	101.8	101.1	110.9	132.0	156.7	177.2	199.6	174.5	165.3	171.4
October	101.1	102.1	112.3	134.4	159.3	180.1	198.3	174.0	166.4	171.9
November	101.3	102.6	114.3	134.5	161.6	184.1	197.2	173.1	167.1	172.3
December	101.1	103.1	114.8	136.2	164.3	188.4	192.6	172.1	167.7	172.0
Average for year	100.0	101.0	108.5	127.6	149.7	172.4	199.6	177.9	166.7	169.8
	Indexes (1914=100) of wholesale prices (all commodities)									
January	100.7	100.0	113.1	149.9	183.6	197.4	231.6	167.4	134.2	149.8
February	100.3	100.7	115.3	153.5	180.2	190.6	230.7	154.0	136.4	151.7
March	99.9	100.1	118.1	158.1	185.6	192.8	232.9	150.4	136.3	153.5
April	99.3	100.9	120.0	167.5	188.4	195.3	243.0	145.2	136.9	152.6
May	99.0	101.3	121.1	177.2	188.1	198.7	245.5	141.3	141.1	149.6
June	99.0	100.3	121.7	179.1	189.4	199.1	244.5	137.2	141.4	147.3
July	98.8	101.8	122.5	180.6	193.8	207.2	243.5	137.2	146.0	144.5
August	102.2	100.7	125.0	183.3	197.2	211.9	237.0	137.3	144.8	143.6
September	103.1	100.3	127.6	181.4	201.9	207.2	227.9	137.2	145.8	146.4
October	99.9	103.1	133.8	179.4	200.1	207.9	211.7	138.2	146.3	146.0
November	99.1	105.3	143.0	180.3	200.1	212.2	195.9	138.3	147.6	144.5
December	98.8	108.7	145.7	180.5	200.1	221.0	177.2	136.4	147.9	144.1
Average for year	100.0	102.1	125.6	172.5	192.8	203.5	226.7	143.3	142.0	147.7

[1] The indexes show average changes in retail prices of selected goods, rents, and services bought by families of wage earners and lower-salaried workers in large cities.

Hours of Work, 1914–23

PREVAILING HOURS IN MANUFACTURING

Prevailing hours of work in manufacturing industries averaged 55.1 hours per week in 1914 and 50.8 hours in 1919.[3] The average for 1923 was 51.1 hours, and for 1929, 50.6 hours. The major change in prevailing hours of work, it will be noted, occurred between 1914 and 1919. These figures are averages of the regularly scheduled hours of plant operation or of shifts, not average weekly hours actually worked.

FULL-TIME HOURS PER WEEK IN SELECTED MANUFACTURING INDUSTRIES

Major sources of information regarding scheduled hours of work are the special industry surveys of wages and hours made by the Bureau of Labor Statistics. In these surveys the term "full-time hours of work" was used. The figures relate to varying periods, but information is available for a considerable number of industries for 1914, for 1924, and for certain intervening years (tables 11 and 12).

[3] These averages are computed from the frequency distributions of workers by prevailing hours of labor per week as formerly published by the Bureau of the Census in the Census of Manufactures.

TABLE 11.—*Average Full-Time Hours per Week in Specified Manufacturing Industries, 1914–24* [1]

Year [2]	Cotton goods	Woolen and worsted goods	Silk	Hosiery and underwear	Men's clothing	Boots and shoes
1914	56.8	55.0	54.6	54.8	51.3	54.7
1915						
1916	56.9	54.8				54.6
1917						
1918	56.0	54.3				52.3
1919			51.6		47.9	
1920	51.8	48.3				48.6
1921						
1922	52.8	48.8		51.0	44.1	48.7
1923						
1924	53.0	49.1		50.7	44.1	49.0

[1] Data are the results of special surveys, published in Bureau of Labor Statistics bulletins, as follows: Cotton goods, Bull. No. 446 (p. 6); woolen and worsted goods, Bull. No. 443 (p. 7); silk, Bull. No. 568 (p. 2); hosiery and underwear, Bull. No. 452 (p. 9); men's clothing, Bull. No. 387 (p. 8); boots and shoes, Bull. No. 450 (p. 2). The averages for men's clothing are not representative of the industry as a whole because of an overrepresentation of larger northern cities.

[2] It should be noted that the special surveys did not cover the whole of the years indicated. They were limited to certain months or periods, as May for the 1914 cotton-goods survey and January to April for the 1924 survey of the boot and shoe industry.

Average full-time weekly hours in the industries covered ranged, in 1914, from 51.3 hours in men's clothing to 64.9 hours in blast furnaces, steel works, and rolling mills (described in the earlier reports as the iron and steel industry). The average for the men's clothing industry represents a coverage confined to larger cities and is probably lower than the average for the industry as a whole. Most of the industries reduced their hours significantly by 1920. Between 1920 and 1924, work schedules were somewhat lengthened in cotton goods, woolen and worsted goods, and boots and shoes. During the period as a whole, however, from 1914 to 1924, all of the available averages show substantial reductions. Full-time hours in cotton goods fell from 56.8 in 1914 to 53.0 in 1924; in the woolen and worsted goods industry, from 55.0 to 49.1; in the hosiery and underwear industry, from 54.8 to 50.7; in men's clothing, from 51.3 to 44.1; and in boots and shoes, from 54.7 to 49.0 hours. The largest reduction (from 64.9 to 55.2 hours) was in blast furnaces, steel works, and rolling mills (table 12).

TABLE 12.—*Average Full-Time Hours per Week in Blast Furnaces, Steel Works, and Rolling Mills, 1914–24* [1]

Department	1914 (May)	1915 (May)	1920 (October)	1922 (October)	1924 (January)
All departments	64.9	65.5	63.1	63.2	55.2
Blast furnaces	74.8	74.9	72.1	72.3	59.7
Bessemer converters	68.4	68.7	70.3	68.7	52.3
Open-hearth furnaces	74.5	74.4	68.7	70.8	58.0
Puddling mills	53.2	52.2	53.9	52.1	55.7
Blooming mills	70.5	71.0	67.5	68.0	54.6
Plate mills	69.0	69.8	68.8	66.2	57.2
Bar mills	61.7	61.4	61.8	61.2	55.6
Standard-rail mills	70.1	70.9	61.2	61.5	57.4
Sheet mills	52.3	52.5	50.3	51.1	50.2
Tin-plate mills	46.0	50.4	50.6	49.9	48.8

[1] Bureau of Labor Statistics Bulletin No. 442 (pp. 3, 4). The figures are not annual averages but are limited to the periods indicated.

The different departments of blast furnaces, steel works, and rolling mills in 1914 showed extreme variations in full-time hours. The blast-furnace average was 74.8 hours, that of open-hearth furnaces was 74.5 hours, and that of standard-rail mills was 70.1 hours; in contrast, the average in tin-plate mills was only 46.0 hours, and two other departments had averages somewhat lower than those of most of the other industries covered by the Bureau of Labor Statistics surveys.

The extremely long workweek in blast furnaces, open-hearth furnaces, and some of the other departments is explained by the survival in many plants of the 12-hour shift and the 7-day week. Wartime public agencies recommended reduction in hours and a few plants adopted the 3-shift system, some of these reverting, however, after the war, to 2 shifts. Hours in the industry as a whole underwent only a small reduction before 1923, the average for October 1922 being 63.2 hours as compared with 64.9 in May 1914. Between October 1922 and January 1924 there was a sharp reduction, from 63.2 to 55.2 hours, largely as a result of the extensive adoption, late in 1923, of the 3-shift system in plants with continuous operation. In many departments of the industry, the 7-day week was retained after the adoption of the 8-hour shift.

SCHEDULED HOURS IN RAILROAD TRANSPORTATION

The distinctive nature of the work schedules of railroad operating employees, especially of those engaged in road service, makes difficult an exact comparison of the hours of these employees with the hours of other groups. The dual basis of pay of road-service employees provides for a basic day's work for a specified mileage or for a specified number of hours, the mileage system being essentially a piece-rate or incentive system. The Adamson Act of 1916, effective in 1917, required that in contracts for labor and service, 8 hours must be deemed a "day's work and a measure or standard of a day's work for the purpose of reckoning the compensation for services." That act applied to operating employees, but in 1918 the Director General of the U. S. Railroad Administration recognized the principle of the basic 8-hour day for nonoperating employees.[4]

SCHEDULED HOURS IN BITUMINOUS-COAL MINING

According to data collected by the Bureau of Mines, little change occurred in the weighted average workday of workers employed in bituminous-coal mining during the period of the First World War and the transitional period following the war. The weighted average workday in 1914 was 8.6 hours, and the average in both 1919 and 1923 was 8.06 hours (table 13). There was, however, a decline in the proportion of workers employed in 10-hour mines, from 23.9 percent in 1914 to 1.1 percent in 1923. The proportion of miners employed in 9-hour mines fell from 15.4 to 4.2 percent, and the proportion working in 8-hour mines rose from 60.7 to 94.7 percent.

[4] The Interstate Commerce Commission before 1919 computed the hours of employees whose time was reported on a daily basis by multiplying the number of days by 10, but beginning in 1919, the Commission multiplied the number of days by 8. There remained many exceptions to the 8-hour day, as for example, among station agents and telegraphers, and many employees continued to work 7 days per week.

TABLE 13.—*Percent of Men Employed in Bituminous-Coal Mines With Established Working Days of 8, 9, and 10 Hours, 1914–23* [1]

Year	Percent of total employees in—			Weighted average working day (hours)
	8-hour mines	9-hour mines	10-hour mines	
1914	60.7	15.4	23.9	8.6
1915	59.6	17.0	23.4	8.6
1916	58.6	17.4	24.0	8.6
1917	79.0	12.6	8.4	8.3
1918	90.6	6.7	2.7	8.12
1919	95.5	3.5	1.0	8.06
1920	97.1	2.0	.9	8.04
1921	96.6	2.9	.5	8.04
1922	95.1	4.0	.9	8.06
1923	94.7	4.2	1.1	8.06

[1] U. S. Bureau of Mines, Coal in 1930 (p. 655) (from Mineral Resources, 1930, Part II). See also U. S. Bureau of Labor Statistics Bulletin No. 516: Hours and Earnings in Bituminous-Coal Mining, 1929 (p. 13). The percentages were calculated on the basis of total number of men in mines definitely reported as having an 8, 9, or 10-hour day. A small number of mines that worked more than 10 hours or less than 8 hours were excluded, as were also all mines for which the reports were defective or which changed their working day during the year.

Prevailing mine practices called for a 6-day week. The full-time workweek, or the number of regular or customary hours per week, was therefore the number of hours per day multiplied by 6, or 51.6 hours in 1914 and 48.4 in 1919 and 1923. The average full-time week, as computed from data collected by the Bureau of Labor Statistics for a sample pay period in 1919, was 48.8 hours.[5]

UNION HOURS IN THE BUILDING AND PRINTING TRADES

There was little change in the weekly hours of union workers in the building trades as embodied in union agreements (table 14) from 1914 to 1923. The hours, it should be noted, are normal full-time hours, excluding both part time and overtime.

TABLE 14.—*Union Weekly Hours in Building and Printing Trades, 1914–23* [1]

Year	Union weekly hours					
	Building trades			Printing trades		
	All trades	Journeymen	Helpers and laborers	All printing	Book and job	Newspaper
1914	46.4	45.8	48.0	49.5	51.0	44.9
1915	46.4	45.8	47.9	49.5	51.0	44.8
1916	46.2	45.6	47.8	49.5	51.0	44.8
1917	46.1	45.5	47.6	49.5	51.0	44.8
1918	45.9	45.3	47.4	49.5	51.0	44.8
1919	45.6	45.1	47.0	49.5	51.0	44.9
1920	45.4	44.9	46.7	48.1	49.1	44.8
1921	45.3	44.8	46.7	45.1	45.2	44.7
1922	45.3	44.9	46.6	45.0	44.6	45.6
1923	45.4	44.9	46.6	44.8	44.3	45.5

[1] The average weekly hours were calculated by use of indexes applied to the 1944 levels of weekly hours. These indexes were constructed from percentage changes in annual averages which in turn were computed from the quotations of those unions which furnished reports for identical occupations in 2 consecutive years. Data of union weekly hours are collected once each year during the spring or summer. The indexes for the years 1914 to 1923 are based on reports for May 15.

The hours are averages of regularly scheduled straight-time hours under union agreements and are not affected by part time or overtime.

[5] Bureau of Labor Statistics Bulletin No. 279: Hours and Earnings in Anthracite and Bituminous-Coal Mining (p. 9).

As indicated in table 14 above, the average of all trades fell from 46.4 hours in 1914 to 45.6 hours in 1919, and the reduction thereafter (to 45.4 hours in 1923) was nominal. The hours of journeymen building-trades workers were somewhat lower than the hours of helpers and laborers. The average for journeymen fell from 45.8 hours in 1914 to 44.9 hours in 1923, and the average of helpers and laborers fell from 48.0 to 44.6 hours.

CHANGES IN AVERAGE WEEKLY HOURS ACTUALLY WORKED

Average weekly hours have usually been significantly lower than scheduled hours, because hours actually worked are affected by part time, labor turn-over, overtime, illness, and other factors. Information regarding average hours as thus defined is comparatively slight for the period of the First World War and the years immediately following. Estimates are available for the Census years 1914, 1919, and 1923 for manufacturing, coal mining, and railroads (table 15).

Average weekly hours in manufacturing fell from 49.4 in 1914 to 46.3 in 1919. Available information does not permit the making of satisfactory estimates of average weekly hours during the years intervening between 1914 and 1919, but the curtailments of scheduled hours were probably counterbalanced, up to 1918, by reductions in part time and increases in overtime. Employment in factories began to decline in the summer of 1920, and average hours were reduced by part time and labor turn-over. The estimated average in the first quarter of 1922 [6] was 42.7 hours. The industrial recovery beginning in 1922 raised factory employment by 1923 almost to the 1919 level, and average working time rose by 1923 to 45.6 hours per week, not far below the 1919 level.

TABLE 15.—*Average Weekly Hours in Manufacturing, Coal Mining, and Steam Railroads, 1914, 1919, and 1923* [1]

Industry	Average weekly hours		
	1914	1919	1923
Manufacturing	49.4	46.3	45.6
Bituminous-coal mining [2]	35.2	35.5	31.3
Anthracite mining [2]	41.6	42.1	43.2
Steam railroads (class I)	54.1	46.3	45.5

[1] The sources and methods used in computing the averages are described in Monthly Labor Review, September 1940 (pp. 517-544), but the averages there given have been revised.
[2] Travel time in the mine is excluded. The 1943 bituminous-coal agreement and the 1945 anthracite agreement provided for the inclusion of travel time as compensable time, thereby increasing the computed average of weekly hours by 7 or 8 percent.

The reduction of average weekly hours in bituminous-coal mining from 35.5 in 1919 to 31.3 in 1923 is explained largely by an increase in part time. The average number of days of operation of the mines fell from 195 in 1919 to 179 in 1923. Part time and reduced weekly hours were caused in part by the distinctive nature of skills in coal mining and the relative isolation of mining communities, which tended to prevent mine workers from leaving the industry.

Average working time in anthracite mining rose slightly, from 42.1 hours per week in 1919 to 43.2 hours in 1923. The average number of

[6] Computed by dividing average weekly earnings (table 1, p. 13) by average hourly earnings (table 2, p. 14).

days of operation of the mines also rose slightly, from 266 days in 1919 to 268 in 1923.

The average weekly hours of railroad workers fell much more sharply from 1914 to 1919 than did the hours of factory workers, the major cause being the Adamson Act and the widespread shift from the 10-hour to the 8-hour day.[7] The averages for railroads and factories were virtually identical in both 1919 and 1923.

Conditions Affecting Trends After the Two Wars

The extreme variability of wages, and especially of prices, after the First World War was largely a result of the sudden ending of the war in the midst of full-scale preparations, the abrupt transition, and lack of controls of prices and of the flow of materials for production and of goods for consumption. Conditions at the end of World War II gave promise of relative stability. As for wages, there was relatively little control after the First World War, either by collective agreements or by public policies, to raise wages in keeping with labor productivity and prices or to prevent wages from falling below minimum levels such as those later adopted and in effect at the end of World War II.

At the beginning of the First World War the usual workweek was so long that pressure for reductions of hours was effective to a considerable degree during the war, but after the war there were few marked reductions in hours. Average hours during the 20's continued near the levels of 1919. At the beginning of World War II, hours generally had been reduced to a scheduled 40-hour workweek, and average hours actually worked were usually below 40. During the war, hours rose sharply, and the lengthening of the workweek was accompanied by a large increase in the proportion of premium payments for overtime.

The tendency after World War II to restore prewar scheduled hours, with the accompanying elimination of premium payments for overtime, brought about demands for increases in basic rates of wages to check reductions in weekly earnings. Such a program has been adopted by most of the unions. Among Government officials, the Director of the Office of War Mobilization and Reconversion, in his Second Report, April 1, 1945, stated: "I feel sure that ultimately, after the war, total take-home pay in the United States will reach the present level." In his Third Report, the Director stated that workers had voluntarily given up the right to strike, and that this no-strike pledge implies an obligation on the part of the public to protect the workers' standard of living. Wage adjustments should be possible, he stated, because of declines in premium payments for overtime and increases in average output. "Therefore, we must be prepared to make some upward adjustments to compensate for severe declines in take-home pay." [8]

Technological changes and general improvements in the efficiency of production are of primary importance as an economic basis for wage

[7] The railroad averages were derived from Interstate Commerce Commission figures with certain adjustments for comparability, the adjusted figures representing hours paid for and the average number of employees on pay rolls, excluding principal salaried groups.

[8] Office of Director of War Mobilization and Reconversion, Second Report, April 1, 1945 (p. 23); "The War—Phase Two," May 10, 1945 (p. 18); and Third Report, July 1, 1945 (pp. 38, 39): The Road to Tokyo and Beyond.

adjustments. Changes of this nature after the First World War were extensive but were based mainly on postwar developments rather than on wartime experiences. During World War II, there was an unprecedented effort to improve techniques, to promote favorable labor-management relations, and to utilize resources effectively for maximun production. There existed at the end of the war not only a large accumulation of knowledge and experience acquired during the war, but also an exceptional organization of the facilities for research and for the application of improved techniques. Related factors affecting postwar productivity include the lifting of restrictions on materials and equipment for civilian-goods industries, the shortening of the workweek, additional holidays and vacations, and the withdrawal from the labor market of many workers whose age, lack of training, or family duties impaired their efficiency. It is therefore expected that for a considerable period after the war, labor productivity will increase at above-normal rates,[9] or, inversely, that unit labor requirements will materially decline.

Wage changes are significantly subject to such general influences as prevailing economic and political views. During the 20's the prevailing views emphasized dependence on the flow of savings and investment as determined by the "free" competitive markets to maintain "equilibrium" of supply and demand at the level of "full employment" of both labor and capital. The "return to normalcy" was the prevailing ideal, both politically and economically, and "normalcy" implied that full freedom to save and invest would automatically take care of employment, production, and consumption.

The later experiences with depression, unemployment, and public relief, the emergence of World War II out of depression, and the evolution of the war economy with unprecedented use of productive capacity for war, gave rise to new points of view. Emphasis was shifted to the roles of demand, consumption, and the full use of income in maintaining adequate production and employment. The extent of use of current income, and the nature of its use, either for needed productive facilities or for the purchase and consumption of the products, is thus viewed as a vital factor in determining the succeeding volumes of employment, production, and income. These views led in turn to emphasis on the avoidance of unused savings and the maintenance of high levels of wages as the major source of demand and consumption.[10]

---

[9] U. S. Senate, Wartime Technological Developments: A Study made (by the U. S. Bureau of Labor Statistics) for the Subcommittee on War Mobilization of the Committee on Military Affairs. Senate Subcommittee Monograph No. 2 (79th Cong., 1st Sess.), Washington, 1945.

[10] The nature and prominence of such views are illustrated by the Full Employment Bill (S. 380, 79th Cong., 1st Sess.), by the Third Report of the Office of War Mobilization and Reconversion (Washington, 1945), by the Annual Report of the Secretary of Agriculture for 1944 (sections on full industrial employment and adequate wages as the basis of farm prosperity), by the programs of labor unions, and by the more recent concepts in the study of national income as accounting on a national scale and the use of these concepts in the work of such agencies as the National Planning Association.

U. S. GOVERNMENT PRINTING OFFICE: 1946