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CHAPTER VI
CHANGES IN EMPLOYMENT IN THE PRINCIPAL
INDUSTRIAL FIELDS

JANUARY 1, 1920 TO MARCH 31, 1922

BY WILLFORD I. KING

NATIONAL BUREAU OF ECONOMIC RESEARCH

I. THE COMPARATIVE MEASURABILITY OF EMPLOYMENT AND
UNEMPLOYMENT

How important was the reduction in the volume of employment brought about by the decline in business activity occurring between 1920 and 1922? The object of this chapter is to answer the above question.¹

In Chapter IV, W. A. Berridge has derived an index number showing the fluctuations in employment which have occurred in recent years, but he makes no attempt to measure the absolute amount of unemployment at any time. In taking this course, he is following the precedent accepted by most statisticians. The fact is that unemployment is so difficult to define that there are likely to be as many definitions as there are writers on the subject. There may, however, be some points on which accord is possible. Most persons, presumably, would say that only those desiring gainful employment can be subject to unemployment. But who are those that seek gainful employment? Experience shows that thousands of persons are on the border line. Many women work intermittently. The same holds true of many old men and boys. The number seeking gainful work is then, at best, subject only to approximation and not to accurate measurement.

Furthermore, even if the number seeking employment could be ascertained, how could we determine when an individual was involuntarily idle? Is the man who is sick unemployed? Granted that he is, if he remains disabled for years, does he still continue in this status? Shall we count an aged man whose health permits him to work only occasionally as unemployed for the remainder of the time? How shall we class the striker? What about the man who is eager for work at \$1.00 an hour but refuses work at half the pay?

¹ More detailed information concerning this query and also regarding earnings and hours worked is to be found in the report of the National Bureau of Economic Research entitled, "Employment, Hours, and Earnings in Prosperity and Depression."

True, arbitrary rules can be made to fit all of these cases, but the fact should not be overlooked that these rules must be empirical and may represent the exact views of few but the framers. As Mr. Wolman shows in a later chapter, the British have worked out elaborate definitions for use in the administration of unemployment insurance. These definitions are, however, exceedingly complex and require constant interpretation and expansion.

Since it is so difficult to obtain a definite measure of unemployment, it is desirable to attack the problem from another angle. For a long time Massachusetts has furnished monthly records of the number of persons on the pay-rolls of part or all of the factories in that state. There has been a marked growth during recent years in the available supply of this type of statistics.

Owing to the difficulty of defining unemployment, we may hesitate to attempt a statistical measurement, but in these pay-roll records have we not a source of accurate information concerning employment?

One can safely say that pay-roll records represent perfectly definite facts and that their use eliminates most of the difficulties connected with definitions and subjective opinions. If pay-roll statistics are available in complete form, one can ascertain not only the fluctuations in the number of persons on the pay-roll but also the changes occurring in the number of employee-hours worked. With complete data of this sort at hand, it would certainly be possible to answer the query made at the beginning of this chapter and show the magnitude of the cyclical variations in employment.

However, until very recent years, as Miss Van Kleeck points out in Chapter XIX, the data of this sort available have been decidedly scanty. Recent statistics from other states have proved that records for Massachusetts factories indicate reasonably well the course of factory employment in the country as a whole, and hence we can estimate with some confidence the course of factory employment for several decades;¹ but can we assume that fluctuations in factory pay-rolls are representative of the oscillations occurring in agriculture, in merchandising, in banks, or in public utilities? Such an assumption takes too much for granted. Is it not equally probable that every decline in the combined factory pay-roll is met by an increase in the pay-roll of some other industrial field? Further, are we sure that changes in the numbers on the pay-rolls are reasonably good indications of changes in the volume of employment, even in the manufacturing field, when we remember that Mr. Brissenden's figures, recorded in the preceding chapter, indicate that part-time employment plays an important role?

¹ Perhaps estimates for years previous to 1920 might also be successfully made upon the basis of Edmund E. Day's indexes of physical production.

With so many queries unanswered, it is not surprising that, even among experts, there has been great divergence of opinion concerning the volume of unemployment in any period of depression. Estimates of the number idle in 1921 have varied by several millions. The need for a quantitative measurement is illustrated well by Mr. Wolman's description of the experience of the British Government in financing its unemployment insurance fund, and by the difficulty that Mr. Mallery found in securing data suitable for measuring the wage diminutions during a depression so that he could compare this quantity with the size of the potential public works reserve fund.¹

II. THE SCOPE AND METHOD OF THE PRESENT INVESTIGATION

The need of more complete knowledge along this line seemed so great that, in planning the present report, a nation-wide inquiry was undertaken with the purpose of securing the requisite information. The leading results of this investigation appear in the following pages. The specific questions which this inquiry was designed to answer are as follows:

1. Do the high wages characterizing boom times lead many women and others not normally engaged in gainful occupations temporarily to work for wages or salaries?

2. Are fluctuations in different industries complementary, so that the total amount of employment in all fields remains approximately constant? For example, do agricultural laborers or the sons and daughters of farmers or other small employers become employees in factories during boom times and return to their former callings when the depression sets in?

3. Are the fluctuations in factory employment—the only field for which we have records—characteristic of the fluctuations in the entire industrial field including agriculture, merchandising, finance, transportation, and the hand trades?

4. Are changes in the number of persons on the pay-rolls good indicators of the variations occurring in the total volume of employment, or are such variations materially affected by the existence of part-time and overtime employment?

5. Is the existence of much part time or overtime widespread or is it mainly confined to a few industries?

6. Are large and small scale enterprises affected by unemployment to about the same relative extent?

Three questionnaires were devised in the hope of obtaining the material necessary to answer the above queries. The first schedule was designed to secure directly from employees information showing the time they lost through various causes, their hours of work, pay, and family

¹ See Chaps. XVIII and XIV.

income. The effort to secure an adequate number of voluntary enumerators who would canvass employees and obtain records of their employment was not a success. Since the funds available did not permit of the hiring of any considerable number of enumerators, this inquiry was not pushed and the results obtained have but slight value.

The second questionnaire was distributed through the courtesy of the Federal Bureau of Markets and Crop Estimates to their Township Crop Reporters. It asked for the occupations followed during the last two years by members of farmers' families and also for the number of employees hired by each farmer, the hours they worked, and the wages¹ they received. Some 8,500 schedules were returned, most of which were found to contain usable information.

The third questionnaire asked employers in other industries to furnish information similar to that requested of farmers. The United States Census Bureau assisted materially in distributing these schedules. Numerous teachers of economics and a few other teachers and their students, a considerable number of secretaries of Chambers of Commerce, and a large number of individual business men devoted much time, effort, and expense to assisting in the collection of the data.

The Bureau of Railway Economics furnished practically complete data for the railways. The United States Chamber of Commerce circularized its members in behalf of the study. In addition to such voluntary efforts, paid enumerators obtained numerous records from employers in the cities of New York, Chicago, and St. Louis. In all, nearly 3,000 satisfactory records were obtained, covering all sections of the United States and most of the important fields of industry. The schedules were edited and verified by the National Bureau of Economic Research, but the Bureau of the Census assumed the burden of tabulating the data.

Manifestly, a large proportion of all the records received, especially in the case of smaller concerns, rest upon estimates rather than upon actual accounts. The estimates, however, relate to things concerning which the employer, as a rule, is far from ignorant; hence there is little reason to suppose that accidental errors in the estimates have materially affected the accuracy of the averages. The belief that the estimates are substantially accurate is supported by the fact that, in almost every industry, the reported data show but a small scatter.

It is highly probable that the changes shown by the data are more typical than are the absolute sizes of some of the quantities. In many instances, for example, an employer cannot estimate very accurately the absolute number of hours worked per week by his employees, but he is likely to know approximately how much the average working day has increased or diminished in a given period.

¹ For wage records see the detailed report entitled, "Employment, Hours, and Earnings in Prosperity and Depression."

Another question of moment is whether enough reports have been deliberately falsified to vitiate the averages. We have no guarantee of course that some such cases have not occurred, but it is believed that the fact that the schedules were obtained under the auspices of the Bureau of the Census and that assurance was given to informants that all information would be considered confidential has minimized any tendency to falsification which might otherwise have existed. The similarity of the items in the reports received from different employers in the same business leads one to believe that the results are reasonably dependable.

It also is worthy of mention that schedules collected from similar establishments by hired enumerators and those collected by mail lead to identical conclusions regarding tendencies within any given field of employment. The pay-roll data secured from factories show the same general trend that appears in similar records published by governmental departments, both state and federal. On the whole, then, the evidence seems to be sufficient to warrant the belief that the results of this inquiry are for the most part reliable.

III. RESULTS

Records were secured from employers who hire about one-tenth of all the employees in the United States. However, the proportion differs radically in different industries, a fact that is illustrated by the entries in Table XV. Under these circumstances, a total or average of all the samples would be highly misleading. To secure significant results, it has been necessary to reweight all of the items according to the number of workers employed in the industry in question. The process followed has been first to estimate the ratio of the total number of employees in the United States falling in the given category on August 15, 1920 to the number who on the same date were working for the reporting employers, and then to multiply all items of earnings or hours by these ratios. In this manner, a record is obtained which portrays, as accurately as the data will permit, the results for the Continental United States. Owing to the paucity of existing information concerning the number of employees working for large and for small scale enterprises in such fields as the hand trades, public, domestic, and professional service, or commerce and trade, the weights used may sometimes be very faulty, but, fortunately, the nature of the data is such that it is almost certain that errors arising from this source will not invalidate any of the major conclusions of the study.

Fortunately, answers have been secured for all six of the questions previously cited as the goal of this study.

Tables XVI and XVII show no indication that there has been any noticeable migration from one industry to another of the sons and daughters either of farmers or of other employers. All that is apparent is

TABLE XV.—AN ESTIMATE OF THE PERCENTS OF ALL EMPLOYEES IN THE VARIOUS INDUSTRIAL FIELDS WHO WERE WORKING ON AUGUST 15, 1920 FOR THE EMPLOYERS FROM WHOM REPORTS WERE RECEIVED

Industry	Size of enterprise as measured by the number of employees	Estimated thousands of employees actually working in U. S.	Number employed by employers responding to this inquiry	Estimated per cent of all employees working for reporting employers	Industry	Size of enterprise as measured by the number of employees	Estimated thousands of employees actually working in U. S.	Number employed by employers responding to this inquiry	Estimated per cent of all employees working for reporting employers
All industries.....	Any number	29,180	3,146,682	10.784	Transportation.....	Any number	3,420 ^a	2,301,636	67.299
	Less than 21	10,110	25,153	0.248		Less than 21	400	549	0.137
	21 to 100	4,680	36,521	0.789		21 to 100	220	3,361	0.153
Agriculture.....	Over 100	14,440	3,085,048	21.364	Over 100	2,800	2,297,726	82.062	
	Any number	2,300 ^a	14,705	0.639	Commerce and trade.....	Any number	2,600 ^b	137,202	5.277
	Less than 21	2,120	14,171	0.668		Less than 21	1,650	5,558	0.337
21 to 100	130	272	0.209	21 to 100		400	11,256	2.814	
Extraction of minerals.	Over 100	50	262	0.524	Over 100	550	120,388	21.889	
	Any number	1,120 ^a	56,771	5.068	Finance.....	Any number	400 ^b	29,758	7.439
	Less than 21	60	26	0.0433		Less than 21	150	483	0.322
21 to 100	140	320	0.238	21 to 100		100	2,061	2.091	
Factory work.....	Over 100	920	56,425	6.133	Over 100	150	27,214	18.742	
	Any number	11,370 ^a	581,879	5.118	Public and professional services.....	Any number	3,000 ^c	2,454	0.0818
	Less than 21	1,360	2,672	0.195		Less than 21	1,600	87	0.00544
21 to 100	1,950	16,902	0.867	21 to 100		400	188	0.047	
Building and construction.....	Over 100	8,060	562,305	6.976	Over 100	1,000	2,179	0.2179	
	Any number	1,600 ^a	1,497	0.0875	Other hand trades.....	Any number	2,820 ^b	19,507	0.691
	Less than 21	530	462	0.0871		Less than 21	1,920	631	0.0328
21 to 100	500	441	0.0882	21 to 100		1,600	1,069	0.178	
Other hand trades.....	Over 100	110	301	0.273	Over 100	300	17,807	5.936	

^a Estimates of number of employees and their apportionment probably close to the truth
^b Total number of employees approximately correct, but apportionment may be widely in error.
^c Estimates very rough.

TABLE XVI.—DISTRIBUTION BY INDUSTRIES IN 1920-1922 OF PERSONS WHO IN 1922 WERE MEMBERS OF THE FAMILIES OF REPORTING ENTREPRENEURS (EXCLUDING FARMERS) AND WHO WERE 16 YEARS OF AGE OR OVER IN 1922^a

Sex	Industry	1920				1921				1922		
		First quarter	Second quarter	Third quarter	Fourth quarter	First quarter	Second quarter	Third quarter	Fourth quarter	First quarter	Fourth quarter	
Male	All industries.....	1,415	1,415	1,415	1,414	1,414	1,414	1,415	1,415	1,415	1,415	
	Agriculture.....	163	175	219	168	165	177	220	172	169	169	
	Extraction of minerals.....	4	6	4	4	4	6	5	5	5	5	
	Factory work.....	147	145	147	145	148	148	150	148	149	149	
	Building and construction.....	70	73	74	70	68	69	72	68	68	68	
	Other hand trades.....	92	90	92	89	91	92	93	90	90	90	
	Transportation.....	14	15	16	16	15	16	17	16	16	16	
	Commerce and trade.....	615	615	626	616	616	616	629	622	621	621	
	Finance.....	19	19	19	18	20	19	19	20	18	18	
	Public and professional service.....	22	22	24	23	22	21	22	17	17	17	
	Domestic and personal service.....	86	87	91	89	87	89	92	89	88	88	
	Not gainfully occupied.....	163	148	82	157	159	143	74	148	152	152	
	Industry unknown.....	20	20	21	19	19	18	22	20	20	20	
	All industries.....	487	487	487	487	487	487	487	487	487	487	
	Female	Agriculture.....	1	1	3	2	1	1	3	2	1	1
		Factory work.....	17	16	18	16	16	16	18	16	16	16
		Other hand trades.....	12	12	12	12	12	12	13	13	13	13
Transportation.....		2	2	2	2	2	2	2	2	2	2	
Commerce and trade.....		70	70	72	70	71	71	72	70	72	72	
Finance.....		3	3	3	5	3	3	5	3	3	3	
Public and professional service.....		37	37	36	39	39	39	36	41	40	40	
Domestic and personal service.....		29	31	34	32	31	33	35	32	31	31	
Not gainfully occupied.....		290	289	283	284	288	287	282	285	286	286	
Industry unknown.....		26	26	24	25	24	23	21	23	23	23	

^a Females working on the home farm are classed as "Not Gainfully Occupied."

EMPLOYMENT IN 1920-1922

TABLE XVII.—THE NUMBER OF MEMBERS OF 8,477 REPRESENTATIVE* FARMERS' FAMILIES WHO WERE 16 YEARS OF AGE OR OVER IN 1922 AND THE INDUSTRIES IN WHICH THEY HAD BEEN EMPLOYED

Sex	Industry	1920				1921				1922	
		First quarter	Second quarter	Third quarter	Fourth quarter	First quarter	Second quarter	Third quarter	Fourth quarter	First quarter	Fourth quarter
Male	All industries.....	14,643	14,643	14,643	14,643	14,642	14,641	14,639	14,637	14,637	14,637
	Agriculture.....	11,671	12,312	12,993	11,810	11,717	12,324	12,909	11,786	11,739	11,739
	Extraction of minerals.....	30	24	28	37	38	44	44	46	51	51
	Factory production.....	100	90	93	107	100	73	83	94	88	88
	Construction.....	102	99	113	104	85	113	134	124	98	98
	Other hand trades.....	161	125	134	152	163	131	125	138	165	165
	Transportation.....	197	174	192	198	201	182	191	197	198	198
	Commerce and trade.....	273	220	232	277	295	249	265	311	325	325
	Finance.....	64	58	60	69	67	63	66	75	70	70
	Public and professional service.....	406	278	221	380	405	287	225	423	420	420
	Domestic and personal service.....	22	16	29	23	24	22	31	26	26	26
	Not gainfully occupied.....	1,484	1,126	423	1,371	1,423	1,057	444	1,290	1,336	1,336
	Industry unknown.....	133	121	125	115	124	108	122	127	121	121
	All industries.....	6,614	6,614	6,612	6,612	6,611	6,611	6,611	6,609	6,609	6,609
	Agriculture.....	26	29	43	29	28	32	48	32	34	34
	Extraction of minerals.....										
	Factory production.....	15	15	12	15	15	16	13	19	18	18
Construction.....											
Other hand trades.....	25	27	27	27	27	26	28	27	27	27	
Transportation.....	26	26	30	29	29	31	31	31	31	31	
Commerce and trade.....	126	128	145	134	130	134	152	145	137	137	
Finance.....	9	8	9	10	11	10	8	8	8	8	
Public and professional service.....	603	553	228	650	664	604	245	716	722	722	
Domestic and personal service.....	64	67	79	71	75	74	88	81	84	84	
Not gainfully occupied.....	5,683	5,723	6,004	5,610	5,996	5,651	5,965	5,513	5,508	5,508	
Industry unknown.....	37	38	35	37	36	33	33	37	40	40	

* Information obtained from the *Crop Reporters* of the U. S. Department of Agriculture. All sections of the Continental United States represented in approximately correct proportions.

a growth in numbers in almost every industry, the growth doubtless being due to the fact that many of the younger boys and girls working in 1922 finished school during the period under consideration. The records received furnish, then, no evidence whatever that any material part of the additional force of employees recruited in boom times by manufacturers or other large scale employers is drawn from the households of small employers, farmers, or others working on their own account.

Table XVIII measures the estimated changes in the total number of hours worked by different classes of farm employees in the different sections of the United States. Though one is impressed by the very great seasonal fluctuations in agricultural employment, there is no evidence of any startling change brought about by the business cycle. There was apparently a slight tendency for farmers to hire fewer employees during the depression. There is certainly no evidence that the farmers took on any considerable number of the workers whom the factories, mines, and railways laid off. Since the sample of farms secured is large enough to be representative this conclusion seems to rest on a firm foundation and strengthens the indications given by the figures pertaining to business men's families that the depression was accompanied by a striking decline in the total volume of employment in the United States.

Table XIX records the estimated numbers of employees who were on the pay-rolls of the various industries in each quarter. The last column of the table shows the per cent of change in this number taking place between the peak and trough of the cycle. Allowance has been made for the seasonal variations in many industries.¹ The figures show that the business depression brought about a reduction in the number employed in every industry except the hand trades and the trivial increase in that one field is scarcely sufficient to keep pace with the growth of population. The reduction in all industries amounted to about 4,000,000 workers or nearly one-seventh of all persons employed at the crest of the 1920 boom. There is, however, a striking difference between industries in the degree to which they were affected. Mines, steam railways, and factories dealing in metals, metallic, and miscellaneous products lost very large fractions of their employees, while the construction industry and factories in general, with the exception of paper and printing establishments, also had a notable falling off in the numbers employed. On the other hand the records for agriculture, finance, public utilities,² and wholesale

¹ In such industries, (namely agriculture, building and construction, other hand trades, public, professional and domestic service, transportation, wholesale trade, and establishments manufacturing food, drink, tobacco, lumber, paper, and derived products) the per cents stated represent the maximum declines between corresponding quarters of 1920 and 1921 or of 1920 and 1922. This same procedure is followed in other tables of this chapter.

² See sub-title "Other Transportation" in all tables. This item includes telephones and telegraphs.

TABLE XVIII.—EMPLOYEE-HOURS WORKED PER WEEK ON A GROUP OF REPRESENTATIVE FARMS OF THE CONTINENTAL UNITED STATES

Sex	Employees working by	Number of farms enumerated	Section of the United States	1920				1921				1922	
				First quarter	Second quarter	Third quarter	Fourth quarter	First quarter	Second quarter	Third quarter	Fourth quarter	First quarter	Fourth quarter
Male	Month...	6,348	Entire U. S.	222,582	306,022	336,664	260,342	218,639	301,533	329,119	255,650	220,421	
			Northeast.....	51,700	64,126	74,929	60,485	52,467	66,901	76,449	61,987	53,663	
			North Central.....	59,142	96,542	107,793	75,842	56,244	91,360	100,717	71,846	55,851	
			South.....	88,075	109,101	109,336	96,940	86,713	106,869	106,824	94,443	87,252	
	Day.....	2,557	West.....	23,665	36,253	44,606	27,675	23,215	36,403	45,129	27,374	23,655	
			Entire U. S.	128,176	189,078	303,803	189,105	121,269	195,994	300,839	185,794	129,931	
			Northeast.....	22,890	38,211	65,945	38,564	23,412	39,870	66,606	39,469	23,316	
			North Central.....	15,126	34,216	79,051	35,108	15,720	37,142	75,995	32,613	17,309	
	Week....	2,000	South.....	76,237	91,205	103,163	88,922	68,407	92,827	103,681	86,680	75,342	
			West.....	13,923	25,446	55,644	26,511	13,730	26,155	54,557	27,032	13,964	
			Entire U. S.	26,836	32,804	37,100	28,756	25,996	32,100	36,444	28,131	28,337	
			Northeast.....	6,700	7,818	10,505	7,716	6,427	7,889	10,040	7,734	6,705	
Day.....	1,960	North Central.....	7,051	9,235	11,245	7,503	6,162	8,849	10,327	6,779	6,741		
		South.....	11,450	13,417	12,358	12,003	11,874	13,211	13,083	12,012	13,141		
		West.....	1,635	2,334	2,992	1,534	1,533	2,151	2,994	1,606	1,750		
		Entire U. S.	31,528	43,365	56,815	41,663	25,261	42,409	52,338	36,659	27,134		
Week....	636	Northeast.....	4,864	7,071	14,294	7,642	4,433	7,018	14,840	6,936	3,610		
		North Central.....	3,527	5,426	7,199	4,135	4,121	4,793	7,376	4,095	3,406		
		South.....	21,803	28,643	29,573	25,909	10,021	27,953	25,024	22,694	18,628		
		West.....	1,334	2,225	5,749	3,887	1,386	2,645	5,098	2,934	1,490		

TABLE XIX.—AN ESTIMATE FOR THE CONTINENTAL UNITED STATES OF THE TOTAL NUMBER OF EMPLOYEES ON THE PAY-ROLLS OF ALL ENTERPRISES OF WHATEVER SIZE

Industry	Thousands of employees on the pay-rolls												Maximum cyclical decline (per cent)
	1920				1921				1922				
	First quarter	Second quarter	Third quarter	Fourth quarter	First quarter	Second quarter	Third quarter	Fourth quarter	First quarter	Second quarter			
All industries.....	27,232	28,352	29,180	27,416	24,828	24,600	25,078	24,774	24,147				14
Agriculture.....	1,370	1,871	2,300	1,724	1,355	1,823	2,204	1,666	1,372				4
Extraction of minerals.....	1,047	1,072	1,120	1,077	1,011	960	944	862	819				27
Building and construction.....	1,240	1,492	1,600	1,307	1,104	1,211	1,415	1,404	1,320				19
Other hand trades.....	548	575	550	568	554	581	565	572	561				0.7 ^d
Finance.....	390	399	400	396	398	384	380	373	374				7
Public and professional service.....	3,075	3,022	3,000	3,047	3,120	2,973	2,940	3,161	3,269				2
Domestic and personal service.....	2,683	2,763	2,820	2,781	2,741	2,753	2,786	2,701	2,661				3
All transportation.....	3,169	3,243	3,420	3,352	2,847	2,739	2,865	2,922	2,674				16
Steam railways.....	2,032	2,044	2,200	2,101	1,724	1,599	1,710	1,741	1,586				22
Other transportation.....	1,136	1,199	1,220	1,251	1,123	1,140	1,155	1,181	1,088				6
Commerce and trade.....	2,562	2,580	2,600	2,656	2,507	2,527	2,520	2,582	2,477				3
Wholesale.....	288	303	300	286	274	284	284	273	265				6
Retail.....	2,274	2,277	2,300	2,370	2,233	2,242	2,236	2,309	2,212				3
All factories.....	11,149	11,334	11,370	10,507	9,189	8,648	8,460	8,532	8,621				26
Food, drink, and tobacco.....	1,048	1,015	1,120	1,075	881	858	959	952	861				16
Lumber and its products.....	985	1,062	1,050	912	839	928	915	852	855				15
Metals and metal products ^a	5,104	5,213	5,200	4,743	3,901	3,305	2,979	3,020	3,238				43
Paper and printing.....	639	636	640	666	619	602	599	623	620				6
Mineral products ^b	878	881	910	892	793	748	750	763	760				18
Textile and leather products ^c	2,495	2,525	2,450	2,220	2,155	2,206	2,257	2,322	2,287				15

^a Vehicles, railroad cars, and all products not elsewhere recorded are included here.

^b Includes chemical, stone, glass, and clay products.

^c Includes clothing of all kinds.

^d Increase—minimum for corresponding quarters.

dealers, show very moderate decreases, while public, professional, domestic, and personal service, and retail trade gave approximately the same amount of employment throughout the period.

CHART 14.—DIFFERENCES IN THE TOTAL HOURS OF EMPLOYMENT GIVEN QUARTERLY AT THE PEAK AND AT THE TROUGH OF THE BUSINESS CYCLE BY ENTERPRISES EMPLOYING FEWER THAN 21 PERSONS EACH IN THE FIRST QUARTER OF 1920.

YEAR AND QUARTER	1920-Third	1921-Third	1920-Third	1921-Third	1920-Third	1922-First	1920-Third	1921-Third	1920-Second	1921-Second	1920-Fourth	1921-Fourth	1920-Fourth	1921-Fourth	1920-Third	1921-Fourth
FULL-TIME EMPLOYEE HOURS SCHEDULED (MILLIONS)	7,105	6,892	1,526	1,491	32	33	922	844	330	284	321	312	1,189	1,169	2,804	2,624
EMPLOYEE HOURS (MILLIONS)																
EMPLOYEE HOURS WORKED (MILLIONS)	6,956	6,742	1,488	1,456	23	23	901	827	307	362	323	311	1,180	1,165	2,767	2,573
INDUSTRY	ALL INDUSTRIES	AGRI-CULTURE	EXTRACTION OF MINERALS	FACTORIES	BUILDING AND CONSTRUCTION	TRANS-PORTATION	TRADE AND COMMERCE	ALL OTHER INDUSTRIES								

Table XX furnishes the best available measure of the fluctuations of the actual volume of employment, for it records the numbers of employee-hours worked rather than the numbers of persons on the payrolls. The falling off for all industries amounted to about one-sixth of the hours of work put in at the peak of activity in most lines of business. However, this decrease was far from uniform, the hand trades even show-

ing a very small increase. Mining, construction work, steam railways, and factories were the industries which felt the cycle most severely.

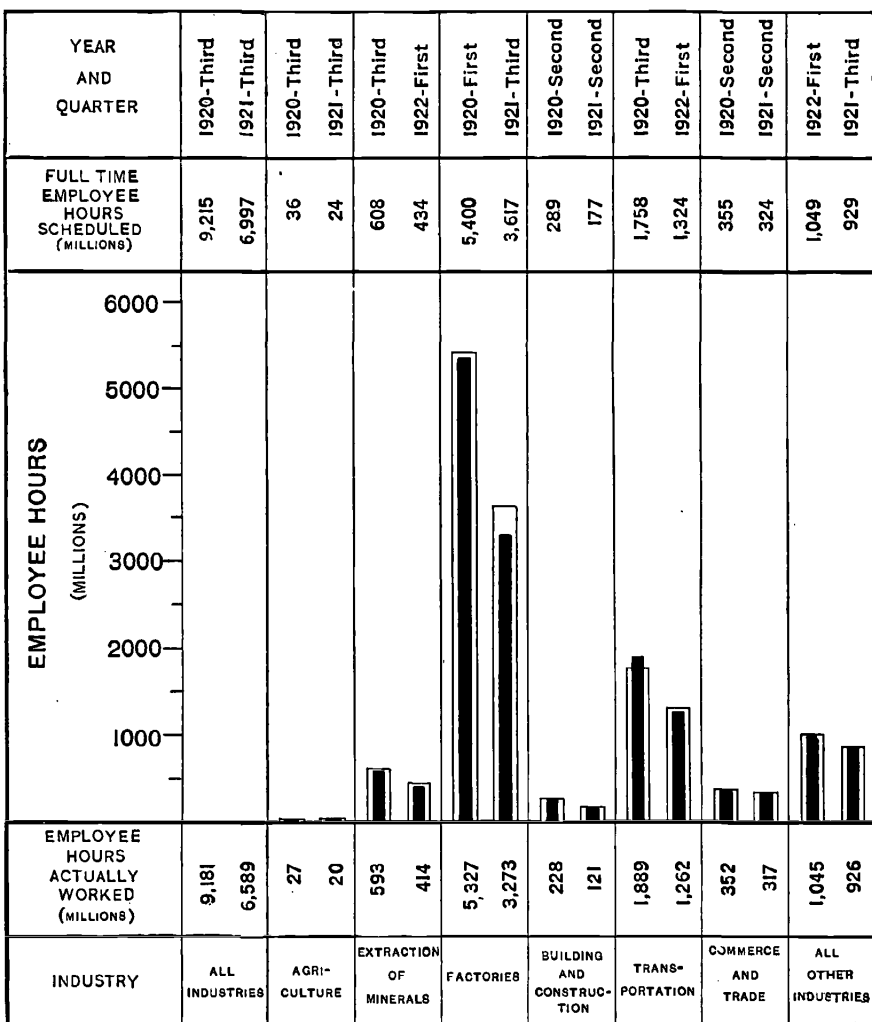
CHART 15.—DIFFERENCES IN THE TOTAL HOURS OF EMPLOYMENT GIVEN QUARTERLY AT THE PEAK AND AT THE TROUGH OF THE BUSINESS CYCLE BY ENTERPRISES EMPLOYING FROM 21 TO 100 PERSONS EACH IN THE FIRST QUARTER OF 1920.

YEAR AND QUARTER	1920-Third	1922-First	1920-Second	1921-Second	1920-Fourth	1922-First	1920-Third	1921-Third	1920-Third	1921-Third	1920-Fourth	1921-Fourth	1920-Third	1921-Third	1920-First	1922-First
FULL-TIME EMPLOYEE HOURS SCHEDULED (MILLIONS)	3,132	2,640	117	89	99	59	1,313	1,010	322	278	156	140	270	255	904	851
EMPLOYEE HOURS (MILLIONS)																
EMPLOYEE HOURS WORKED (MILLIONS)	2,926	2,521	98	81	92	54	1,171	946	311	264	153	138	258	243	854	836
INDUSTRY	ALL INDUSTRIES		AGRI-CULTURE		EXTRACTION OF MINERALS		FACTORIES		BUILDING AND CONSTRUCTION		TRANSPORTATION		TRADE AND COMMERCE		ALL OTHER INDUSTRIES	

The totals of time worked declined somewhat more than did the numbers of workers on the respective pay-rolls. The reason for this is mainly that there was a tendency in some fields during the depression to retain the employees on the pay-rolls but to have them work part time. This fact is brought out in Charts 14, 15, 16 and Table XX. On these

charts the hollow bars represent the number of hours that would have been put in if all employees on the pay-rolls had worked full time. The

CHART 16.—DIFFERENCES IN THE TOTAL HOURS OF EMPLOYMENT GIVEN QUARTERLY AT THE PEAK AND AT THE TROUGH OF THE BUSINESS CYCLE BY ENTERPRISES EMPLOYING MORE THAN 100 PERSONS EACH IN THE FIRST QUARTER OF 1920.



solid black bars indicate the hours actually worked. The difference in the lengths of the bars of each pair represents the change in employment taking place between the crest and the trough of the employment cycle in the given industry. It is clear that when measured in absolute terms the important declines in employment were those occurring in factories,

TABLE XX.—AN ESTIMATE FOR THE CONTINENTAL UNITED STATES OF THE TOTAL HOURS ACTUALLY WORKED PER QUARTER BY ALL EMPLOYEES IN ENTERPRISES OF ALL SIZES

Industry	Millions of hours worked per quarter										Maximum cyclical decline (per cent)
	1920				1921				1922		
	First quarter	Second quarter	Third quarter	Fourth quarter	First quarter	Second quarter	Third quarter	Fourth quarter	First quarter	Fourth quarter	
All industries.....	17,747	18,395	19,063	17,611	15,515	15,548	15,918	15,655	15,180	15,180	16
Agriculture.....	911	1,265	1,603	1,148	882	1,250	1,552	1,112	898	898	3
Extraction of minerals.....	648	654	698	672	590	549	534	509	491	491	30
Building and construction.....	702	851	914	751	619	690	805	796	751	751	19
Other hand trades.....	353	377	357	370	355	379	367	370	361	361	0.5 ^a
Finance.....	231	234	238	234	235	225	224	221	221	221	7
Public and professional service.....	1,961	1,928	1,922	1,905	1,952	1,841	1,834	1,939	2,032	2,032	5
Domestic and personal service.....	1,956	1,991	2,037	2,019	1,973	1,985	2,022	1,936	1,920	1,920	4
All transportation.....	2,104	2,163	2,323	2,231	1,800	1,755	1,824	1,866	1,639	1,639	21
Steam railways.....	1,359	1,374	1,513	1,388	1,068	1,004	1,064	1,080	936	936	30
Other transportation.....	745	789	810	842	731	750	759	785	703	703	7
Commerce and trade.....	1,733	1,772	1,762	1,799	1,698	1,723	1,707	1,749	1,671	1,671	3
Wholesale.....	185	197	195	186	178	187	184	176	171	171	6
Retail.....	1,548	1,574	1,566	1,612	1,519	1,535	1,523	1,573	1,500	1,500	3
All factories.....	7,143	7,154	7,204	6,478	5,406	5,148	5,045	5,152	5,191	5,191	30
Food, drink and tobacco.....	678	664	740	710	573	564	628	627	557	557	15
Lumber and its products.....	648	704	699	591	530	608	594	551	555	555	18
Metals and metal products.....	3,375	3,331	3,354	2,953	2,244	1,857	1,736	1,736	1,954	1,954	50
Paper and printing.....	396	394	394	412	375	359	352	379	368	368	11
Mineral products ^b	565	571	583	570	492	474	474	488	477	477	19
Textile and leather products ^c	1,479	1,488	1,431	1,240	1,189	1,284	1,315	1,368	1,277	1,277	20

^a Vehicles, railroad cars, and all products not elsewhere recorded are included here.

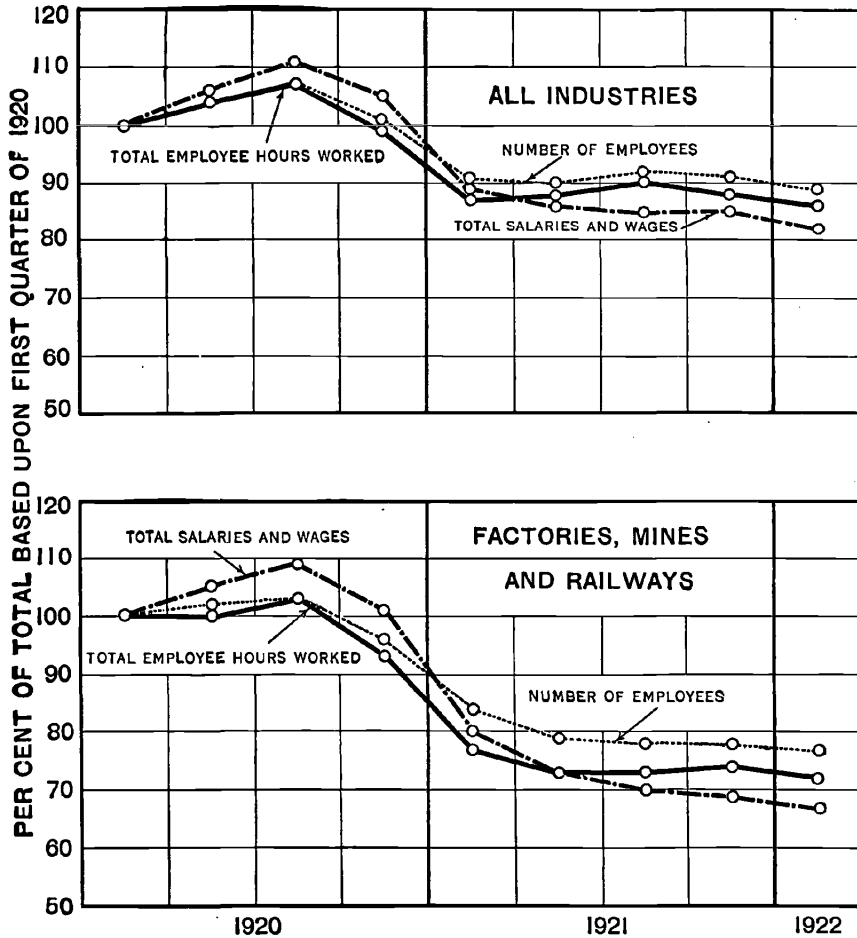
^b Includes chemical, stone, glass, and clay products.

^c Includes clothing of all kinds.

^d Increase—minimum for corresponding quarters.

especially in the larger plants. There were also shrinkages of some moment in mining, in building and construction, and in miscellaneous industries.

CHART 17.—RELATIVE CHANGES IN THE NUMBER OF EMPLOYEES ON PAY-ROLLS, TOTAL EMPLOYEE HOURS WORKED, AND COMBINED SALARY AND WAGE PAYMENTS IN THE CONTINENTAL UNITED STATES.

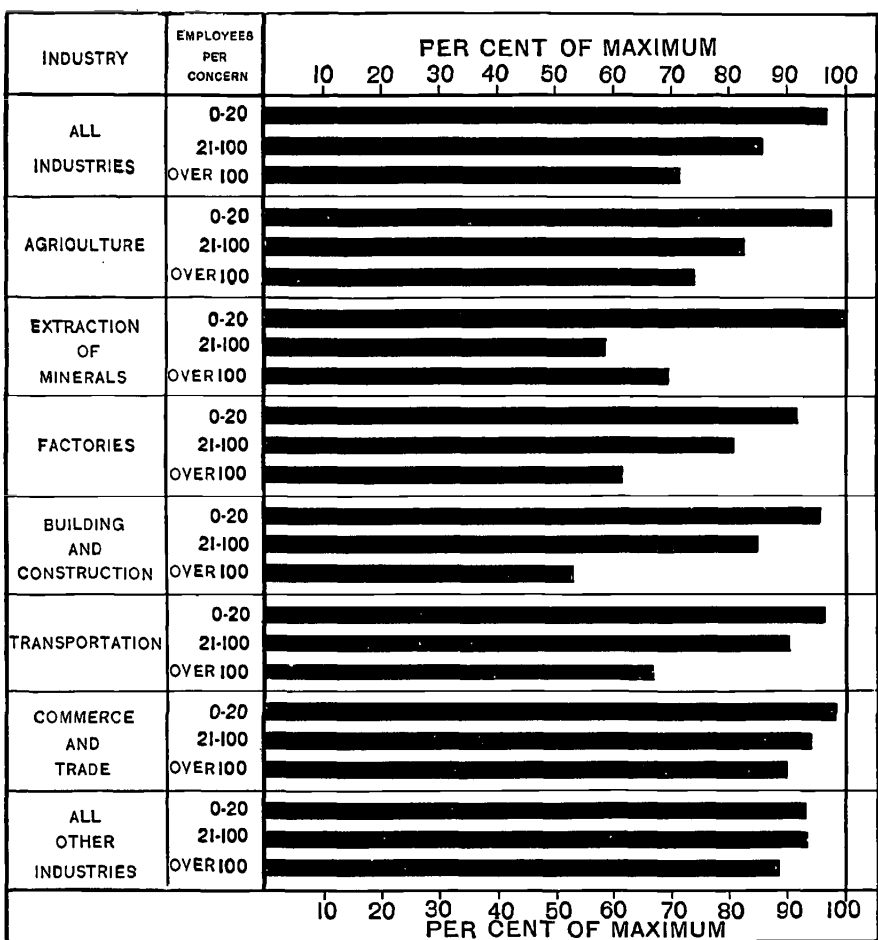


Part time appears to have been resorted to mainly by the railways, by the mining industry, and by certain classes of manufacturers. The figures for agriculture are based upon only a few records and therefore cannot be considered dependable. It is clear that, during a depression, part-time work is in general responsible for a far smaller proportion of the decline in total employment than is the laying off of employees.

That total payments in the form of wages and salaries declined to even a greater degree than did the total hours worked is apparent from a

comparison of the right hand columns of Tables XX and XXII. Chart 17 brings out the interesting point that the records neither of the numbers of persons on the pay-rolls nor of the total wage and salary payments are accurate criteria of changes in the volume of work done.

CHART 18.—EMPLOYMENT AT THE TROUGH OF THE 1921 DEPRESSION EXPRESSED AS A PERCENTAGE OF THE MAXIMUM IN THE 1920 BOOM, MEASURED IN TOTAL HOURS WORKED BY ALL EMPLOYEES.



During the boom, salaries and wages rose faster than did total employee-hours, and in the following depression they fell further. On the other hand, the total number of hours worked during the period of decline in industrial activity diminished distinctly faster than did the number of employees on all pay-rolls. Evidently, then, adequate statistics of employment must include a record of the total employee-hours worked as well as records of the numbers on the pay-rolls and totals of wage and salary payments.

EMPLOYMENT IN 1920-1922

TABLE XXI.—AN ESTIMATE FOR THE CONTINENTAL UNITED STATES OF THE PER CENT OF FULL TIME WORKED BY THE AVERAGE EMPLOYEE WHILE ON THE PAY-ROLL IN ENTERPRISES OF ALL SIZES

Industry	Per cent of full time worked										Decline from highest to lowest recorded	
	1920					1921						1922
	First quarter	Second quarter	Third quarter	Fourth quarter	First quarter	Second quarter	Third quarter	Fourth quarter	First quarter			
All industries.....	98.5	97.5	98.0	97.4	95.3	95.8	95.8	96.4	96.2	3.2		
Agriculture.....	95.1	93.2	96.9	98.9	92.4	95.1	97.4	99.6	94.1	6.5		
Extraction of minerals.....	94.3	93.1	95.1	94.8	90.7	90.2	88.4	92.8	93.4	6.7		
Building and construction.....	94.1	94.6	94.6	94.9	92.9	94.3	94.4	94.5	102.1	2.0		
Other hand trades.....	96.9	98.3	97.1	97.6	95.8	97.7	97.2	97.0	96.2	2.5		
Finance.....	99.5	100.1	100.1	99.3	99.4	98.9	99.7	99.4	99.5	1.2		
Public and professional service.....	100.6	100.1	100.0	100.3	101.4	100.3	99.9	99.9	100.5	1.5		
Domestic and personal service.....	98.2	97.8	97.9	98.5	97.8	98.0	97.9	97.0	97.9	1.5		
All transportation.....	103.6	103.8	105.7	103.1	98.6	99.7	99.0	99.0	95.9	9.8		
Steam railways.....	106.8	107.4	109.9	105.6	99.0	100.4	99.5	99.1	94.2	15.7		
Other transportation.....	98.2	98.1	98.7	99.3	97.9	98.9	98.5	98.8	98.1	1.4		
Commerce and trade.....	97.9	98.1	98.1	98.7	98.1	98.1	97.7	98.7	98.2	1.0		
Wholesale.....	98.9	99.0	99.0	100.3	99.9	99.4	98.6	99.0	98.8	1.7		
Retail.....	97.8	97.9	98.0	98.5	97.9	97.9	97.6	98.7	98.1	0.9		
All factories.....	98.1	96.3	96.2	94.4	91.6	92.3	92.2	93.3	93.3	6.5		
Food, drink, and tobacco.....	97.4	97.9	95.8	96.3	97.6	98.1	95.7	96.8	96.6	2.4		
Lumber and its products.....	94.7	94.9	95.6	95.0	94.0	94.7	95.2	95.5	95.5	1.6		
Metals and metal products*.....	97.9	96.0	96.6	93.9	88.5	87.0	88.5	92.5	92.5	12.7		
Paper and printing.....	98.7	98.6	98.0	98.5	96.8	95.9	95.8	98.2	95.7	3.0		
Mineral products ^b	98.4	99.0	98.5	97.4	94.1	96.0	95.6	96.4	95.2	4.9		
Textile and leather products*.....	96.0	95.4	94.3	91.6	91.3	94.7	94.4	94.9	91.0	5.0		

^a Vehicles, railroad cars, and all products not elsewhere recorded are included here.

^b Includes chemical, stone, glass, and clay products.

* Includes clothing of all kinds.

TABLE XXII.—AN ESTIMATE FOR THE CONTINENTAL UNITED STATES OF THE TOTAL QUARTERLY WAGES AND SALARIES PAID TO ALL EMPLOYEES BY ALL ENTERPRISES OF WHATEVER SIZE

Industry	Millions of dollars paid to employees										Maximum cyclical decline (per cent)
	1920				1921				1922		
	First quarter	Second quarter	Third quarter	Fourth quarter	First quarter	Second quarter	Third quarter	Fourth quarter	First quarter	Fourth quarter	
All industries.....	9,463	10,048	10,472	9,905	8,380	8,114	8,047	8,055	7,743	23	
Agriculture.....	216	323	483	316	201	279	390	250	181	19	
Extraction of minerals.....	477	488	548	540	465	423	396	364	349	36	
Building and construction.....	528	656	684	553	446	495	573	575	549	25	
Other hand trades.....	180	193	190	195	183	192	189	193	186	1	
Finance.....	156	161	168	173	169	165	164	169	165	5	
Public and professional service.....	964	960	912	1,046	1,062	1,002	951	1,124	1,117	4 ^d	
Domestic and personal service.....	666	690	700	695	678	678	672	661	643	8	
All transportation.....	1,197	1,341	1,512	1,458	1,170	1,119	1,087	1,111	1,005	28	
Steam railways.....	811	921	1,073	1,002	772	713	679	691	628	37	
Other transportation.....	386	420	440	456	398	406	408	420	377	7	
Commerce and trade.....	828	854	862	887	829	830	823	839	795	5	
Wholesale.....	100	105	107	106	96	99	98	95	88	18	
Retail.....	728	749	756	781	734	731	725	744	707	5	
All factories.....	4,252	4,382	4,410	4,042	3,176	2,929	2,802	2,769	2,752	38	
Food, drink, and tobacco.....	343	343	359	368	297	279	299	288	257	30	
Lumber and its products.....	331	361	371	321	275	296	290	273	267	20	
Metals and metal products ^a	2,176	2,223	2,246	2,004	1,405	1,142	988	970	1,060	57	
Paper and printing.....	240	249	254	272	244	238	232	248	237	9	
Mineral products ^b	303	317	334	335	283	265	260	254	248	26	
Textile and leather products ^c	859	887	856	742	673	708	733	737	683	24	

^a Vehicles, railroad cars, and all products not elsewhere recorded are included here.

^b Includes chemical, stone, glass, and clay products.

^c Includes clothing of all kinds.

^d Increase—minimum for corresponding quarters.

Perhaps the most surprising discovery made in the course of this investigation is the fact brought out by Table XXIII and by Chart 18, that the reduction in employment during the depression of 1921 was a phenomenon affecting most severely the establishments of the larger sizes. While there are a few exceptions to this rule, it nevertheless holds for the great majority of industries. The reason for this state of affairs is not made clear by the figures. It may be due to the more intimate personal relationships existing between small scale employers and their employees; it may arise from the fact that the small producer is in closer touch with the ultimate consumer of his products and can, therefore, better gauge the demand; it may be the result of differences in the nature of the large and small establishments or it may arise from some unsuspected cause.¹ The fact remains that the difference exists and is large enough to be important.

TABLE XXIII.—A COMPARISON OF THE VOLUME OF EMPLOYMENT AT THE PEAK AND IN THE TROUGH FOR LEADING INDUSTRIAL GROUPS

Industry	Employees per concern	Full-time hours (Millions)			Hours actually worked (Millions)		
		Peak	Trough	Per cent decline	Peak	Trough	Per cent change
All industries.....	0-20	7,105	6,892	3.00	6,956	6,742	3.08
	21-100	3,132	2,640	15.71	2,926	2,521	13.84
	Over 100	9,215	6,997	24.07	9,181	6,589	28.23
Agriculture.....	0-20	1,526	1,491	2.29	1,488	1,456	2.15
	21-100	117	89	23.93	98	81	17.35
	Over 100	36	24	33.33	27	20	25.93
Extraction of minerals.....	0-20	32	33	3.13	23	23	0.00
	21-100	99	59	40.40	92	54	41.31
	Over 100	608	434	28.62	593	414	30.18
Factories.....	0-20	922	844	8.46	901	827	8.21
	21-100	1,313	1,010	23.07	1,171	946	19.21
	Over 100	5,400	3,617	33.02	5,327	3,273	38.56
Building and construction....	0-20	330	284	13.94	307	262	14.66
	21-100	322	278	13.66	311	264	15.11
	Over 100	289	177	38.75	228	121	46.93
Transportation.....	0-20	321	312	2.80	323	311	3.72
	21-100	156	140	10.26	153	138	9.80
	Over 100	1,758	1,324	24.69	1,889	1,262	33.19
Commerce and trade.....	0-20	1,189	1,169	1.68	1,180	1,165	1.27
	21-100	270	255	5.56	258	243	5.81
	Over 100	355	324	8.73	352	317	9.94
All other industries.....	0-20	2,804	2,624	6.42	2,767	2,573	7.01
	21-100	904	851	5.86	894	836	6.49
	Over 100	1,049	929	11.44	1,045	926	11.39

¹ I am inclined to believe that one reason why small enterprises show a lower percentage of unemployment during depressions is that in such enterprises there is a prompter liquidation of costs, perhaps even of wage rates.—Note by M. C. ROEY.

IV. SUMMARY

The results of this investigation may be summarized briefly as follows:

1. The depression of 1921 caused a diminution of approximately one-sixth in the total volume of employment in the United States.
2. The reduction due to part-time work was confined mainly to a few fields and was relatively of slight importance when considered for industry as a whole.
3. The shift of workers from one industrial field to another was small in extent.
4. Workers in mining, transportation, and manufacturing were the principal sufferers from the decline in employment.
5. Small employers in general gave more steady employment than did large employers in the same industries.
6. To get an accurate picture of changes in total employment, it is not sufficient to collect data concerning numbers on the pay-rolls or total wages and salaries paid. The only data that give the precise measurement needed are those showing the numbers of employee-hours worked.