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CHAPTER V

UNDER-EMPLOYMENT

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I. RELATION BETWEEN UNDER-EMPLOYMENT AND UNEMPLOYMENT

Most of the known facts about the amount of employment are "yes and no" facts reported by employers or trade union secretaries to show now many are, or how many are not, on a pay-roll. These facts do not throw any light upon the question: How many workers are partially employed or under-employed? If a wage-earner's name is on the pay-roll he is among the employed; if, and when, it is dropped from the pay-roll he is among the unemployed. But though on the pay-roll the employee nay be working only three days a week, while, on the other hand, his absence from one pay-roll does not necessarily mean absence from other pay-rolls.

II. PHASES OF UNDER-EMPLOYMENT

The employer may meet a serious slump in the demand for his product n several ways. (1) He may run the plant at less than capacity but at normal or customary full-time schedule. This reduced capacity operation may be brought about through the lay-off of a sufficient number of nands or through the rotation of hands by employing, say, half of them on Mondays, Wednesdays, and Fridays and the other half on the other hree working-days of the week. (2) He may reduce the operating time of the plant. This part-time operation may be managed by reducing he length of the work day, by cutting down the number of days worked ber week, or where more than one shift per day is worked, by reducing the number of shifts. (3) He may close the plant entirely for a longer or horter period of time.

Manifestly, these several alternatives mean somewhat different prelicaments for the workers involved. Under-capacity operation at fullime schedule means total unemployment for the workers in so far as it is ttained by the laying off of hands. In so far as it is accomplished by otation of hands, or "division of work," it means under-employment. The worker is also under-employed when the operating time of the whole plant is reduced either in hours per day or days per week.¹ The effect

¹ This may not be the case when the shorter operating schedule is accomplished y reduction in the number of shifts per day. The result in this case is unemployment. of closing down the plant may be unemployment or it may be underemployment, depending upon the circumstances. If the worker who is thrown out as a result of a shut-down remains unemployed and continues in the community anticipating a resumption of operation, and particularly if he is somewhat relied upon by his old employer as an available hand when business picks up, it would seem to be under-employment.

III. CHARACTER OF THE DATA ON UNDER-EMPLOYMENT

In this country we have no continuous "time data" showing directly either the extent or the trend of under-employment.¹ Foreign employment statistics contain a good deal more direct information on underemployment than do our own, possibly because the alternative devices of short-time operation and division of work are more widely resorted to in Europe. In default of direct time data on under-employment, resort must be had to fragmentary statistical data on (1) relative numbers unemployed and employed on part time, (2) yearly operating time in factories and mines, (3) time actually worked compared with normal full time, (4) time lost "on the job," and (5) overtime.

IV. WHAT THE PRESENT DATA SHOW

Relative Numbers Unemployed and Employed on Short Time.— Although not continuous data, the results of three recent investigations possibly deserve a passing reference because they represent important official estimates of the amount of under-employment.² The first inquiry was that made by the United States Bureau of Labor Statistics in 1915 The figures tell us nothing about cyclical under-employment. They do reveal, however, the great importance of under-employment in relation to the general problem of unemployment. This inquiry indicated that in 1915 in the specified cities, 16.6 per cent of the 647,394 wage-earners covered were under-employed while only 11.5 per cent were totally unemployed.³

The other two investigations are much more recent. The Mayor's Unemployment Committee of Columbus, Ohio, in October and November 1921, found that 13.6 per cent of the 9,000 men and 7.0 per cent of the 2,000 women reported were entirely idle, while 10.4 per cent of the men and 9.3 per cent of the women were employed part time.⁴ In December

¹ An exception should be made of the figures collected by W. I. King and interpreted by him in the following chapter.

² What was probably the first detailed and comprehensive investigation of the extent of under-employment was the work of Carroll D. Wright in the Massachusetts Census of 1885. Mr. Wright's figures showed exact proportions of part time worked and classified them so as to show what part of the under-employment in that year was due to slack work. *Massachusetts Census of* 1885, vol. II, pp. 1163-89.

*U. S. Bureau of Labor Statistics, Bulletin 195, p. 6.

⁴ MARK, MARY L., and CROXTON, F. E., Unemployment survey in Columbus Ohio, Monthly Labor Review, April, 1922, p. 17. 1921, the New York State Department of Labor found that of more than 300,000 workers in 1,320 factories 75.9 per cent worked at least full time, including 8.1 per cent who worked overtime while 24.1 per cent worked part time.¹

Statistics Showing Days in Operation.—The extent of underemployment is not by any means accurately measured by reporting the number of days a plant is not in operation. None the less a large and probably a major part of this lost time represents under-employment. This is particularly true in industries like coal mining, where closing down of the works is unlikely to result in the men's abandoning their position as potential employees.

Records of this type running back to 1890 are available in summary form for bituminous coal mines, Massachusetts cotton mills, and for all manufacturing industries in Massachusetts.² All three series show pronounced cyclical fluctuations. For example the number of days bituminous coal mines were in operation was 48 days less in the dull year. 1894 than in the good year, 1892. The corresponding decline in working time was 32 days in the cotton mills and 21 days in all Massachusetts factories. At the next great change from boom to depression, 1906-1908, the decline in working time for these three groups was 20, 34, and 22 days respectively. Between 1913, not an active year, and 1914 the drops were 37, 1, and 9 days. For the post-war years we have figures for coal mines only. They worked 220 days in 1920 and according to the latest official estimate, 155 days in 1921-a decline of 65 days.³ In general, bituminous coal miners lose about one-fourth of their possible working time through non-operation of the mines-a loss attributed to overdevelopment and to seasonal factors as well as to business depression.

It is to be remembered that these figures represent probably minimum under-employment, since what they reflect is the number of days the employees have opportunity to work. Under-employment due to absenteeism and under-employment on the job due to waiting for work, for cars, etc., must be added to that caused by suspension of operation.

Normal or Basic Full Time Compared with Actual Time Worked. To report merely the *number* of workers who are employed on part

¹ The Industrial Bulletin, January and February, 1922, p. 67. The figures reported are for the week including December 15, in most cases the week ended December 17. For distribution of those working part time see below, p. 71.

² Reports of the U. S. Geological Survey, Massachusetts Annual Report on the Statistics of Manufactures, and HOWARD, S. E., Unemployment in the Massachusetts Cotton Industry, p. 89. Other data on yearly operating time have been published by the U. S. Bureau of the Census, the U. S. Bureau of Labor Statistics, and by several states besides Massachusetts, but the figures are not continuous.

³ TRYON, F. G., and MCKENNEY, W. F., The Broken Year of the Bituminous Miner, *The Survey Graphic*, April, 1922, p. 1009. The figures given in this article are 222 days worked in 1920 and 169 in 1921. The revised figure for 1920 is 220 and recent official reports indicate that 155 is close to the truth for 1921. time is to get only the vaguest notion concerning the precise amount of under-employment suffered by them. Such a report does not inform us whether the part-time workers were reduced from a full-time 6-day week to a 5-day week or whether they were cut to a 3-day week. There is, manifestly, three times as much under-employment in the latter case as there is in the former.

Some conception of the width of the margin between theoretically possible full-time employment and the time actually worked as well as the cyclical fluctuations in the width of this margin may be had from figures showing the total number of days or hours actually worked during specified periods as compared with normal full-time.¹

In the report of an investigation of unemployment in Philadelphia, made in 1915 by Joseph H. Willits, a chart is given showing the total number of man-days actually worked each week by piece workers in an Axminster carpet mill and the total days which would have been worked by the same employees if they had had full-time employment.² Data for the time actually worked include only time lost outside of the mill and do not include time lost on the job waiting in the mill for dye or other material. Nor, of course, do the figures include employees who are laid off and consequently put in a situation which means total unemployment. The data refer almost entirely to time lost on account of irregularity or lack of orders. For the whole period covered, April, 1911-March, 1915, the proportion of full time actually worked was not quite 75 per cent. The maximum proportion in any quarter was 93 per cent (April-June, 1914) and the minimum 44 per cent (January-March, 1915).

The record of this carpet mill is significant, but it is, after all, only one establishment. More comprehensive is the comparison between actual and full-time records in the iron and steel industry made by the United States Bureau of Labor Statistics. The record shows by months from July, 1913 to June, 1915, for 59,752 iron and steel employees in 227 plants, the per cent of the turns (shifts) customarily worked which were not worked because of slack work. This is equivalent to the per cent of full time lost because of slack work. The figures run from a minimum

¹ A similar indirect clue to the extent of part-time employment may be had by an examination of such time data on earnings as include comparison between actual weekly earnings and nominal full-time earnings. The U. S. Bureau of Labor Statistics and a few of the state bureaus have published statistics of this sort. Also, as pointed out in Chapter XIX, figures showing for the same groups of establishments the number of employees and amounts paid in wages may reflect part-time and overtime employment. The value of such statistics as a measure of part time may be almost entirely destroyed, however, because of the disturbing effect of changes in rates.

² WILLITS, JOSEPH H., "Philadelphia Unemployment," Philadelphia Department of Public Works, 1915, opp. p. 125. Published also in *The Annals*, May, 1916, Supplement, opp. p. 60. loss of 10 per cent of full time in July, 1913 to a maximum loss of 47 per cent in December, 1914.¹

A more exact idea of the relation between time worked and nominal full time is given by figures showing the distribution of the total number on short time according to the percentage of nominal full time worked by them. Of such figures one sample must suffice.² In its series of reports on wages and hours of labor in different industries the Bureau of Labor Statistics has published certain tables giving the number and per cent of employees working different percentages of full time. Some of these figures are brought together in Table XII. As would be expected a larger proportion of the employees worked less than 100 per cent of full time in 1914 than in either 1916 or 1918. It is not entirely clear from

¹ Bulletin 218, pp. 28, 30-55. The figures given are obtained by combining the Bureau's figures for the separate divisions of the iron and steel industry. Unfortunately the Bureau's recently published bulletin (305) on wages and hours in the iron and steel industry does not continue this valuable series.

² The New York State report already mentioned showed that in December, 1921, a time of depression, 13.9 per cent of the 313,167 factory employees reported 5 days worked a week, 5.4 per cent 4 days, and 4.8 per cent 3 days or less. *The Industrial Bulletin*, January and February, 1922, p. 67. Figures for different industries are as follows:

	Number of estab- lishments	Number of em- ployees	Percentage working				
Industry (December, 1921)			Over- time	Full time	Five days	Four days	Three days or less
Boots and shoes	20	8 013	0.6	54 5	31.0	7.6	5.4
Men's clothing	50	14 145	57	85 7	33	1.0	3.5
Cotton goods	5	4 640	5.2	00.1 01 6	2.3	0.7	0.0
Hosiery and knit goods	56	13.817	6.8	72 1	12.4	4 4	4 3
Wool manufactures	19	12,343	2.5	90.1	1.8	2.8	2.8
Saw and planing mill prod-	•						
ucts	39	4,096	8.0	69.5	14.4	3.9	4.2
Furniture and cabinet work.	42	6,070	9.6	66.3	13.4	1.3	9.4

A short series of time data revealing the extent of under-employment in the bituminous coal mining industry in a period of depression has been computed by the U. S. Bureau of Labor Statistics on the basis of reports made to the U. S. Geological Survey. The figures show for each week from Oct. 8, 1921, to Mar. 18, 1922, the number of mines closed the entire week and the number operating specified lengths of time during each week. For the original data by weeks see *Monthly Labor Review*, April, 1922, p. 13 and May, 1922, p. 144. The record from October to February first appeared in *Hearings before House Committee on Labor* on H. R. Bill No. 11022, Sixtyseventh Congress, Second Session, 1922, p. 37.

these figures, however, that a smaller proportion worked overtime in 1914. The figures are inconclusive.

Year and industry 。		Number of establish- ments		Percentage of employees working specified proportions of full time				
			Number of employees	100 per cent and over	Under 100 per cent	Under 75 per cent	Under 50 per cent	Under 25 per cent
1914	Boots and shoes b	85	50,662	39	61	18	5	1
	Mens clothing •	153	22,386	59	41	13	4	1
	Cotton goods, manufacturing d	62	38,558	63	37	19	9	4
	Cotton goods, finishing d	25	11,178	63	37	9	3	1
	Knit goods	47	18,548	52	48	16	4	1
	Woolen and worsted, manufactur-		1		1			1
	ing /	44	26,976	55	45	14	5	2
1915	Lumber	88	11,285	62	38	15	6	3
	Millwork	229	12,917	63	37	10	4	2
	Furniture	163	16,573	32	68	17	4	1
1916	Boots and shoes ^h	130	61,127	44	56	13	4	1
	Cotton goods, manufacturing i	85	46,479	66	34	18	9	4
	Cotton goods, finishing	30	11,821	74	26	9	4	2
1918	Boots and shoes ⁱ	136	60,779	52	48	11	4	1
	Cotton goods, manufacturing k	89	47,099	69	31	17	8	3
	Cotton goods, finishing k	30	13,148	73	27	8	4	1
	Woolen and worsted, manufactur-							
	ing 1	57	34,351	69	31	11	4	1
1920	Boots and shoes m	112	49,480	47	53	12	4	1
	1	1	1	1	1	1	1	1

TABLE XII.—PERCENTAGES OF EMPLOYEES WORKING SPECIFIED PROPORTIONS OF Full Time in Certain Industries: 1914, 1915, 1916, 1918, and 1920^a

• Based on pay-roll records for one week in each of the years indicated. Only one-week pay-roll are included.

^b U. S. Bureau of Labor Statistics Bulletin 178, p. 20.

e Bulletin 187, p. 23.

^d Bulletin 190, p. 32.

Bulletin 177, p. 21.

1 Bulletin 190, p. 135.

^o Bulletin 225, pp. 23, 258, 286.

* Bulletin 232, p. 19.

i Bulletin 239, p. 26

i Bulletin 260, p. 16.

^k Bulletin 262, pp. 22, 23.

¹ Bulletin 261, p. 18.

" Bulletin 278, p. 27. In Bulletin 288 figures are given for cotton goods manufacturing for 1920 but they are not presented in a comparable form.

The reason that such figures as those given in Table XII are incon clusive is that they contain items which have no reference to under employment. Figures making comparisons between time actually worked and normal full time or, what foots up to the same thing, between full-tim earnings and actual earnings, should be used very cautiously. At the best they are significant only in reference to changing relations. They have no

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value as measures of the absolute amount of under-employment. These data, for example, nearly always cover labor turnover as well as parttime service. On the pay-roll a man who is hired midway between Saturday pay-days will in all probability have his first or last week's service record reflected in the figures as half-time employment. The degree of this padding varies directly with the rate of turnover and with the length of the pay-roll period. Since the one-week pay-roll periods are likely to be most free from the turnover items, only the one-week payrolls have been utilized here. Finally, it is to be observed that turnover varies inversely with unemployment,¹ whereas part-time employment, of course, fluctuates roughly parallel to total unemployment. The result is that the figures purporting to show the proportions of full time worked are more or less blurred by the turnover figures included in them.²

"Unemployment on the Job."—So far as workers who are paid on the time basis are concerned, it is the time lost outside of the plant, off the job, which measures the amount of under-employment to which they are subject. For piece workers, however, even though they remain at the work place, there is likely to be a considerable amount of "unemployment on the job." A distinction should be noted: "Unemployment within employment" refers to time lost outside of the plant or mine when the employee remains attached to the enterprise and is considered one of the work force, although not actually working, say, more than three days a week, while "unemployment on the job" refers to the additional time which may be lost by piece workers while they are in the factory or mine. Here belong the daily and hourly interruptions which result from break-

¹ An investigation of labor turnover by the U. S. Bureau of Labor Statistics, covering 244,814 employees in 84 establishments in the fiscal year 1913-1914 and 305,901 employees in 176 establishments in 1917-1918 showed that in the earlier period the rate of labor change (the sum of the hiring rate and the separation rate) was 1.9 per full-year (3,000-hour) worker in the earlier and 4.1 in the later period. *Monthly Labor Review*, June, 1920, p. 41. The rates are given in the *Review* as rates "per 10,000 labor hours."

² While it seems highly undesirable to have under-employment data tainted with turnover data, the latter could be made to serve a highly useful purpose in connection with employment and under-employment statistics. It was shown in the last chapter that figures reporting the number employed (or unemployed) constitute a sensitive index to general business conditions. For many purposes their value would be greatly enhanced, if, along with the number employed, there could be reported from month to month the numbers hired and leaving. The accession and separation rates derived from these absolute numbers could then be thrown alongside the employment figures. This would make possible, for instance, the detection of any industries, occupations or plants where, say, inordinately high turnover appeared at a time of low employment. The collection of such figures by the Bureau of Labor Statistics and by such states as New York, as a part of the returns now made on employment, would seem to be feasible down of machinery, waiting for work, waiting for dye (in carpet mills), waiting for cars (in coal mines), and so forth.¹

While most loss of time on the job is occasioned by the necessity of waiting for work, waiting for parts, and by machine breakdowns, not all of it is due to such shortcomings. Some is unquestionably due to inefficient methods of work, not to mention downright "soldiering" on the part of employees. Thus, the Committee on Waste in Industry made a careful study of the methods and performances of eleven workers in the men's ready-made-clothing industry. These workers were on week work and, consequently, lacked certain incentives which they would have had on piece work. The investigation showed that 45 per cent of the time spent on the work was unnecessary.² Part of this waste was due to unnecessary slowness and part of it to unnecessary time spent in doing the job in a roundabout way. Obviously in these circumstances, there is no under-employment, inasmuch as the time workers are getting paid for all of the time.³ Such time-wasting methods would mean virtually unemployment on the job in the case of piece workers, and for that very reason, there is among them little unnecessary slowness.

Statistics of Overtime.—To some extent, naturally, the loss incurred by an employee because of short-time employment in periods of depression may be compensated for by overtime employment which he may secure in periods of business prosperity. The statistical evidence

¹ For example, in "one of the best run plants in the country" in the boot and shoe industry the total working time, represented as 100 per cent, is divided up as follows:

Actual productive time	76	per cent
Lost time	24	per cent
This 24 per cent of lost time is divided up as follows:		
Variation in style	7.2	$\mathtt{per} \; \mathtt{cent}$
Poor deliveries	4.5	per cent
Lack of machine parts	3.5	per cent
Poor control flow work	2.8	$\mathtt{per} \ \mathtt{cen} t$
Machine breakdowns	2.6	per cent
Findings	2.4	per cent
Equipment failure	1.0	${\tt per \ cent}$

This record is reported by the Committee on Elimination of Waste in Industry of the Federated American Engineering Societies, "Waste in Industry," p. 148. The Committee found that the average loss in productive time in other shops in the same industry is between 30 and 35 per cent. Unfortunately there appear to be no time data in existence to throw light upon the relation between "unemployment on the job" and the business cycle. It is not likely, however, that the relation between the two is at all the same as that which holds between the business cycle and other phases of underemployment. In periods of prosperity, both management and men are less efficient and, consequently, less time is probably lost within the shop in periods in depression than in boom periods.

² "Waste in Industry," p. 109.

³ It is to be noted that in such circumstances the employer is the one who must shoulder the loss.

of the extent of overtime is discontinuous and fragmentary, but a few samples may be presented.

1. The extent of overtime in a key industry in May, 1910 was shown in a report made by the Department of Commerce and Labor on *Conditions of Employment in the Iron and Steel Industry*. For 17,170 productive employees in various divisions of the steel industry, the per cent of overtime to regular full time was 8.0 per cent, while for 20,811 nonproductive employees this percentage was 8.7 per cent.¹ The report states, in connection with these figures that "conditions shown here may . . . be regarded as those normally existing in large plants during periods of full activity."²

2. The amount of overtime among the employees in the lumber, mill work, and furniture industries is reported for the year 1915 by the Bureau of Labor Statistics.³ These figures show that of 40,775 employees on one-week pay-rolls in more than four hundred establishments, 3,125, or 7.7 per cent worked overtime and that of 31,080 employees on two-week or semi-monthly pay-rolls in more than two hundred and fifty establishments, 2,877 or 9.3 per cent worked overtime.

3. Of 12,156 telephoue operators employed in New York State during the week ending Dec. 13, 1919, 30 per cent worked overtime.⁴

4. Among workers in the metal trades in Massachusetts the percentage of actual hours worked weekly which were overtime hours increased continuously each year from 1914–1918 and dropped considerably between 1918–1919. The figures are given in the following table:

Year	Number of male time workers	Average hours actually worked	Percentage weekly hours worked in overtime	Percentage of time workers working over- time
1914	3,875	46.4	0.6	5.8
1915	4,430	54.5	3.9	25.6
1916	8,151	53.4	6.3	39.7
1917	8,433	53.7	8.6	44.7
1918	9,115	51.9	14.2	65.3
1919	7,310	49.3	4.2	39.5
	1	}	(

TABLE XIII.—OVERTIME AMONG METAL TRADES WORKERS IN MASSACHUSETT	's ª
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^aAnnual Report on the Statistics of Labor for year ending Nov. 30, 1920, Part III, p. 22.

¹ Report on Conditions of Employment in the Iron and Steel Industry in the United States, Sixty-second Congress, First Session, Senate Doc., No. 110, vol. III, pp. 196, 197.

² Ibid., p. 195.

³ U. S. Bureau of Labor Statistics, Bulletin 225, pp. 54-61, 270-3, 308-14.

⁴ New York State Department of Labor, *Special Bulletin* 100, The Telephone Industry, July, 1920, p. 31.

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5. Comprehensive figures on wages and hours of steam railroad employees became available in July, 1921, when the Interstate Commerce Commission began the publication of a revised series of railway wage statistics. The Commission's reports show that the average overtime per employee per month from July, 1921-April, 1922 inclusive, was 9.2 hours.¹

6. The Annual Reports of the New Jersey Bureau of Statistics of Labor and Industries furnish, for the period 1905–1916, important time data on both overtime and days in operation. A comparison of the two series is made in Table XIV. The inverse cyclical relation between overtime and short-time operation is obvious.

Year	Number of estab- lishments	Average number of workers employed	Average days in operation	Number of working days lost ^b	Number of establish- ments in which over- time was worked	Average hours over- time per worker employed
1905	2,018	239.113	290	16	367	7.3
1906	2,120	260,072	289	17	434	7.6
1907	2,152	280,280	286	20	348	8.5
1908	2,127	245,712	279	27	254	3.3
1909	2,291	279,351	287	19	341	4.7
1910	2,423	302,265	288	18	388	7.1
1911	2,475	305,295	287	19	373	5.7
1912	2,556	323,390	288	18	428	5.6
1913	2,638	333,018	284	22	399	4.0
1914	2,624	325,634	280	26	269	3.1
1915	2,817	353,848	286	20	423	5.2
1916	2,950	437,657	292	14	607	15.7

TABLE XIV.—Overtime and Time Lost in New Jersey Manufacturing Estalishments, 1905–1916^a

^a N. J. Bureau of Statistics of Labor and Industry, Annual Reports.

^b On the basis of 306 possible working days.

V. CONCLUSIONS

The foregoing recital of the odds and ends of statistical evidence concerning the extent and character of cyclical under-employment shows the inadequacy of the data. We have little enough information on cyclical unemployment. On under-employment there is even less. What fragmentary data do exist are almost entirely discontinuous—the by-

¹Interstate Commerce Commission, Wage Statistics, Class I Steam Roads in the U.S. This figure is based upon employees reported on an hourly basis. These constituted during the period covered about 94 per cent of all employees on Class I roads.

products of surveys. Yet it seems a simple enough matter, along with returns for the number employed or unemployed, to get continuing monthy reports giving the number partially employed. Several European countries have within a year or two begun the continuous reporting of data of this character.

The figures which we have been able to present suffice, however, to show (1) that there is a good deal of under-employment of a cyclical character (2) that under-employment fluctuates with the peaks and depressions of the business cycle in much the same manner as unemployment, and (3) that overtime employment rises when under-employment falls. Further, it seems probable that overtime does not fluctuate as widely as under-employment, that is, overtime probably does not even in the long run compensate for short time. European evidence suggests that at the beginning of depression there are likely to be more persons partially employed than are totally unemployed. How that matter stands in this country we have still to learn. But it is clear that even the best figures which show merely the number of men unemployed, or the shrinking numbers on pay-rolls, are an inadequate measure of unemployment.