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LABOR TURNOVER IN INDUSTRY

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TORONTO

LABOR TURNOVER IN INDUSTRY

A Statistical Analysis

BY

PAUL FREDERICK BRISSENDEN

ASSISTANT PROFESSOR IN COLUMBIA UNIVERSITY

AND

EMIL FRANKEL

FORMERLY SPECIAL AGENT OF THE UNITED STATES DEPARTMENT OF LABOR

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1922

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Set up and electrotyped. Published, October, 1922

Press of
J. J. Little & Ives Company
New York

TO

THE UNITED STATES BUREAU OF
LABOR STATISTICS

PREFACE

THE figures which constitute the basis for the statistical analysis presented in these pages were collected for the United States Bureau of Labor Statistics by the authors and other members of the Bureau's staff. A large part of the material thus collected already has been utilized in various articles published in the Bureau's *Monthly Labor Review*. The Bureau of Labor Statistics, however, is responsible neither for the opinions herein expressed by the authors nor for the statistical treatment its original figures have received at their hands.

The authors desire to express their appreciation of the help they have received from Dr. Royal Meeker, formerly Commissioner of Labor Statistics and now editor of the *International Labour Review*, and from Mr. Lucian W. Chaney, of the staff of the Bureau of Labor Statistics. Mr. Ethelbert Stewart, now Commissioner of Labor Statistics, was in general charge of the field work of the Bureau's investigation of labor turnover. Working with the authors under his direction were Messrs. Boris Emmet, William F. Kirk, and Irving Winslow. To them and to Mr. Stewart the authors are very much indebted and they wish to take this opportunity to express their appreciation. Although they are too numerous to mention by name, the authors desire to express their deep sense of obligation to the hundreds of employment managers, factory superintendents, and business executives who cheerfully put themselves to great inconvenience in order to furnish the necessary information. The authors earnestly hope that this analysis of the figures they so kindly furnished may be of use to some of them.

To the Academy of Political Science at Columbia University, the Ronald Press Company, and the University of Chicago Press, the authors desire to extend thanks for permission to reprint material originally published in the *Political Science Quarterly*, *Administration*, and the *Journal of Political Economy*.

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LABOR TURNOVER IN INDUSTRY

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CHAPTER I. INTRODUCTION

NATURE AND SIGNIFICANCE OF LABOR MOBILITY

THE difficulty of maintaining a stable work force in industrial establishments has directed attention to the problem of labor instability, — a phenomenon observable in a particularly intensified form in times of prosperity, but found in only slightly less serious form even in periods of depression. Labor instability is regarded by all those who have given any serious consideration to the problem as one of the maladjustments of our industrial life, wasteful and destructive of the potential man-power of the nation and a serious obstacle to the complete utilization of the country's productive forces. In tackling this problem it should be recognized at the outset that within certain limits establishment labor mobility is a normal and necessary thing. A certain amount of shifting from shop to shop and city to city is quite normal and even desirable; part of this necessary movement of labor is an entirely natural ebb and flow resulting from the normal expansion and contraction of industrial activity. Interest in the question of labor mobility is centered, therefore, not only upon its general extent but more specifically upon whatever part of it may be considered abnormal and unnecessary. When it is considered from this standpoint it is essential to know (1) the nature and extent of labor instability, (2) the various factors which are likely to increase or diminish its volume, and (3) whether any employment methods have been or can be devised which will make it possible to reduce labor instability to such an extent that maximum production may be attained at minimum cost and to the mutual advantage of employer and employee.

In order to give really adequate consideration to the various problems involved in labor instability as it affects different industries in the United States, and more particularly to devise methods for its reduction, it will be necessary to have more detailed and extensive data than hitherto have been available. Fortunately, during the last decade a number of progressive firms have given rather close study to the whole problem of labor instability. These concerns have made extensive experiments in labor management with a view to stabilizing the work force and have achieved a measure of success. It is these firms, especially, that have accumulated records sufficiently extensive to show both the magnitude and the intricacies of the problem. These records, moreover, will permit of a test of the effectiveness of certain labor policies and methods of employment. It is upon data from such establishments that this study is very largely based.

Labor instability is generally the consequence of (1) seasonal, cyclical, and other fluctuations in industrial activity which result in varying amounts of employment available to the job seeker; (2) individual or collective dissatisfaction with the conditions of employment; and (3) the dissatisfaction of employers with the services of some employees. In its relation to employer and employee this problem of labor instability becomes a more or less personal one and presents itself essentially in two aspects, depending upon whether it is the employee or employer who is concerned. (1) To the individual workman job changing may mean either gain or loss. In prosperous times, when there are more numerous and attractive job opportunities, the change of jobs may represent an actual gain to the worker. Even if there is nothing gained, it could scarcely involve a loss, because in a rising labor market jobs are likely to be actually awaiting the separating employee, and even at the worst, the period of unemployment between jobs is likely to be relatively short. In periods of depression the establishment labor mobility problem is, for the individual employee, a problem of unemployment and irregular

employment, the employee becoming the unwilling sufferer from the instability, and less commonly the willing cause of it. (2) The individual employer, however, is chiefly interested in the maintenance of a stable working force and regards excessively numerous terminations of employment and, especially, voluntary and more or less avoidable separations as a serious obstacle to efficient and continuous operation. He is also very much concerned with the enormous expense to which he is put because of the excessive labor replacement (or, to use a phrase which has gained currency in industrial circles, — the labor turnover) required for the maintenance of his normal work force.

In the following pages the problem of labor instability is considered primarily from the standpoint of the individual establishment. This is done, not because labor mobility from the individual workman's standpoint is less deserving of consideration, but solely because, as has been explained, the data necessary to the study of this subject were readily available only from the records of those establishments which have made serious attempts to cope with the problem of instability. Looked at from the standpoint of the individual employer it becomes a matter of the first importance to consider the question: How are we to know when an establishment's labor instability becomes excessive? In other words, how are we to know where to draw the line between abnormal and avoidable labor changes and those changes which are due to purely external causes inherent in the industrial situation, — causes over which the employer cannot exercise any effective control? Labor instability may be regarded as excessive and as pointing to maladjustment or mismanagement when its volume is in any considerable excess over its volume in the more progressive concerns which have considerably reduced it, and more especially when its volume is in excess of that common to its particular industry in the same locality at any given time. Conversely, those firms which have a considerably higher stability record than commonly prevails in the industry are generally those which have successfully worked out certain

definite labor and employment policies, as is indicated by figures presented in a later chapter.

As already intimated, a degree of instability which is common and perhaps quite normal and necessary for one industry would be excessive for another. However, if two establishments in the same locality, of about equal size, employing about the same type of worker and engaged in turning out the same product, differ widely in the extent of their labor instability during identical periods of time, this difference usually indicates that the concern whose labor turnover is normal or more nearly normal is either pursuing a more advanced labor policy or that labor conditions (wages, hours, living conditions, etc.) are better than at the other establishment, or even that the more unstable plant is less favorably situated in respect to both of these particulars. Excessive labor instability, in other words, is very likely to be the result of labor mismanagement, low wages, insanitary working conditions, inferior or inadequate housing and transportation facilities, etc., or, what amounts to the same thing, it is the result of the heavy loss of employees to competitors whose labor policies are more enlightened, who pay higher wages, and who provide more attractive working conditions. The frequency of the labor changes, then, is a valuable index to the extent of labor unrest in an industrial establishment and a valuable measure of the effectiveness of the establishment's labor and employment policy.

SCOPE AND LIMITATIONS OF THE BASIC DATA

The statistical matter presented in the following pages is based primarily upon information secured by the authors and other representatives of the United States Bureau of Labor Statistics in the course of two extensive field investigations of the subject. The first of these was a pre-war inquiry made in 1915 and 1916 and reporting in a general way the extent of the turnover during the five-year period 1910–1915, and in more detail for the years 1913 and 1914 both the extent of it and the efforts made to reduce it. The second was a war-time investigation made in 1918,

and resulting in an intensive report on the labor mobility situation for the year ending May 31, 1918. By the use of material secured by correspondence some of the data from these field investigations have been brought down to the end of 1919. Returns from the two inquiries cover upwards of 260 establishments employing over 500,000 workers in seventeen of the most important industrial States.[1]

It is not claimed that the figures presented are necessarily and in all cases representative of American industry as a whole. It is realized that because of the relatively small number of establishments used in this study the various mobility rates shown must be regarded as being merely indicative of the general

[1] The following special articles, dealing with the labor turnover situation in different cities and in particular plants and industry groups as revealed in these investigations, have been published by the Bureau of Labor Statistics in the *Monthly Labor Review:*

Brissenden, P. F. "Labor turnover in the San Francisco Bay region" (February, 1919).

——— "Labor policies and labor turnover in the California oil-refining industry" (April, 1919).

——— "Labor turnover among employees of a California copper mining and smelting company" (May, 1919).

——— "Employment policy and labor stability in a Pacific Coast department store" (November, 1919).

——— "Employment policies and labor mobility in a California sugar refinery" (December, 1919).

——— *and Frankel, Emil.* "The mobility of labor in American industries" (June, 1920). An official summary of the results of the Bureau's labor turnover investigations.

Emmet, Boris. "Labor survey of the Cleveland cloak industry" (August, 1918). On labor turnover and length of service, pp. 225–228.

——— "Labor turnover and employment policies of a large motor-vehicle manufacturing establishment" (October, 1918).

——— "Labor turnover in Cleveland and Detroit" (January, 1918).

Frankel, Emil. "Freight handlers on passenger-freight steamers on the Great Lakes" (April, 1918).

——— "Labor turnover of seamen on the Great Lakes" (June, 1918).

——— "Labor turnover in Cincinnati" (March, 1919).

——— "Labor turnover in Chicago" (September, 1919).

Kirk, William F. "Labor turnover in Milwaukee" (April, 1919).

turnover situation at any given time. But whatever may be the limitations of the figures for the measurement of the amount of labor mobility at any particular time, it is believed that they may be used with entire confidence in gauging the trend in mobility from season to season and from year to year.

CHAPTER II

The Definition and Measurement of Labor Mobility[1]

Any adequate comparison of establishment experience in dealing with labor instability as well as any clear presentation of the relative extent of that instability in different plants make a uniform use of terms and a uniform standard of measurement absolutely necessary. The complex problem of labor instability cannot adequately be discussed or clearly presented by use of a phrase of such necessarily narrow and specialized connotation as "labor turnover," which has, hitherto, been loosely used in reference to establishment labor instability generally. The use of the word "turnover" in any exact sense necessitates the assignment to that word of a precise and definite meaning. This has, so far, never been done. Indeed, the different ways in which the phrase "labor turnover" is interpreted and applied are distressingly numerous. The phrase should obviously be identified with whichever one of the current interpretations appears to have the greatest practical utility. On these grounds it would seem that the term "labor turnover" ought to be used in one sense, and one only, and that strictly in reference to the extent of shift and replacement necessary for the maintenance of the work force. This aspect of the matter is the one with which employers of labor are most intimately concerned. For use in reference to the larger aspect of the flow of labor into and out of industrial establishments, of which labor turnover or labor replacement is only one phase, a more inclusive term needs to be used. It seems that the phrase "labor mobility" best serves this more general purpose and it is accordingly so used in these

[1] Parts of this chapter originally appeared in somewhat different form in an article on "The Measurement of Labor Mobility," 28 *Journ. Polit. Econ.* 441–476 (June, 1920).

pages. This book is given the title "Labor Turnover" because it deals chiefly with the shifting and replacement involved in force maintainance, and because, on the whole, that expression seems less unsatisfactory than "labor replacement."[1]

ACCESSIONS, SEPARATIONS AND REPLACEMENTS

To make it easier to understand the method of measuring labor change in this study, it may be well to clear the ground by briefly referring to three aspects of labor mobility with which the phrase "labor turnover" has been hitherto closely identified. These are: (1) the number of employees hired (accessions), (2) the number leaving (separations), and (3) the number of replacements[2] required to keep up the work force. The United States Bureau of Labor Statistics originally used the replacements as "turnover."[3] Later on it identified separations with "turnover" and followed that method for a time.[4] Among private organizations each of the three concepts has its advocates. It is evident that neither accessions, separations, nor replacements when used alone completely interprets the whole labor mobility situation, nor can they when used alone adequately take into account the constantly varying factors inherent in the industrial situation.

[1] Other expressions roughly synonymous with "labor mobility" are "labor change" and "labor shifting." (See p. 12.)

[2] That is to say, the number of separating employees who have to be (and actually are) replaced.

[3] *Street-railway employment in the United States*, Bureau of Labor Statistics *Bulletin 204*, pp. 193–203.

[4] See articles on labor turnover in the *Monthly Labor Review* for October, 1918, and January, February, and March, 1919. The separations method is the one which has been used most commonly. It has been authoritatively expressed in the formula adopted by the National Association of Employment Managers, which later changed its name to the Industrial Relations Association of America, and which has now become the National Personnel Association. (Standard definition of labor turnover and method of computing percentage "labor turnover" formulated by a special committee at the Rochester Conference of Employment Managers, Rochester, N. Y., May, 1918. This "standard definition" is given in full in the *Monthly Labor Review* of the U. S. Bureau of Labor Statistics for June, 1918, pp. 172–173.)

THE BASE IN "TURNOVER" COMPUTATION

In regard to the base upon which the amount of labor instability is to be computed the situation also leaves much to be desired. The number-on-pay-roll basis which has been most commonly used is patently defective because of the varying numbers of "dead" employees included, that is, employees, absent at first, who eventually separate from service but who are likely to be carried on the pay roll for varying periods of time after they have ceased to be active employees. The Bureau of Labor Statistics, in its first investigation, took the average of the weekly, fortnightly, or monthly numbers on the pay roll as representing the standard working force. This is a padded "standard," as will soon be made evident. The Rochester Conference proposed that the average number actually working from day to day be considered the "standard" working force. This, it is believed, comes nearer to a genuine standard base than any other proposal theretofore advanced. The trouble with both these methods is that they are not standards at all in any proper sense of the word. They may, indeed, constitute a fairly accurate base for determining the rate of labor flow in any particular establishment, but they do not constitute a common base for different establishments.

The Pay Roll as Base. — The statistical evidence available indicates quite conclusively that the average pay-roll number is an inflated and inconstant standard, and therefore a very inaccurate base for use in measuring labor mobility. Some appreciation of the amount of this inflation, due to dead and broken-time names on the pay roll, may be had from an examination of the records of a few establishments which kept their records in such a way that it was possible to compare the actual amount of employment as measured by the labor hours worked with the apparent amount of employment shown by pay-roll figures — which latter figures, of course, show the aggregate number who had been in service for any length of time during the pay period.

In Table 1 there are shown for five establishments the number of equivalent full-time workers for a given period of time and the average number of employees on the pay roll for the same period.

TABLE 1

DIFFERENCE BETWEEN PAY-ROLL NUMBERS AND NUMBER OF EQUIVALENT FULL-TIME WORKERS

CHARACTER OF ESTABLISHMENT	AGGREGATE NUMBER OF ONE-MAN DAYS WORKED	NUMBER OF FULL-TIME WORKERS	AVERAGE NUMBER OF EMPLOYEES ON PAY ROLL	PER CENT EXCESS OF PAY-ROLL NUMBER OVER EQUIVALENT NUMBER OF FULL-TIME WORKERS
Copper mine[1] . . .	82,016	247	298	21
Smelter[1]	130,467	391	506	29
Electro-zinc plant[1] .	45,949	138	185	34
Machine Tool Mfg.[2] .	[3]	3,855[4]	4,046	5
Metal Products Mfg.[5] .	[3]	1,047[4]	1,151	10

Obviously, the margin of excess of the pay-roll number over the number of equivalent full-time workers indicates the extent to which the pay-roll records are "loaded" with names of employees who may have worked only a day or two of the pay period and who, therefore, do not represent employment — but merely a more or less padded pay roll. The use of the pay-roll number, even though it exaggerates the amount of employment (which is the true basis of computation), might still do fairly well as a base in computing mobility if only the margin of inflation were fairly uniform. Unfortunately it is not at all uniform. There are at once apparent wide variations between different plants, the least exaggeration of pay roll appearing in the machine tool manufacturing plant where the excess is only 5 per cent and the greatest in the electro-zinc plant where the excess is 34 per cent. The fluctuations in this margin of inflation are even wider between different pay-roll periods in the same establishments.

[1] Year ending May 31, 1918.
[2] Year ending June 30, 1915.
[3] No report
[4] Average daily work force.
[5] Calendar year 1915.

Thus, in the smelting plant shown in the above table the margin of pay-roll inflation ranges from 7 per cent in February to 52 per cent in April. These figures indicate that the true active working complement is unquestionably considerably smaller than the apparent complement indicated on the face of the pay-roll records. This margin is due to the counting of the names of those employees who served only a part of the pay period but whose names, nevertheless, were not dropped from the pay roll until after the end of the pay period. It is obvious that the pay-roll figures must be discounted for this "broken-time" margin. The necessity for making such a discount of the pay-roll figures forces the conclusion that the true base in labor mobility rate calculation must be expressed in some standard unit, say, 3000 hours — time roughly equivalent to the time put in by one employee working one year.

Average Daily Work Force. — A base subsequently recommended and one which more clearly approaches a true standard is the average daily work force, based upon attendance records. But it was found that even the use of the average daily working force as a base was hardly adequate for comparative purposes because the widely varying length of the work-day in different establishments, industries, and cities makes such figures inadequate. The average daily attendance plan was proposed very largely because it approximates more closely the average number of full-year workers. Since the amount of "turnover" is measured by the ratio between the number of replacements made and the average number of workers who are continuously employed throughout the period, it is evident that the requisite standard is to be arrived at by somehow pruning down the pay-roll figures to the equivalent number of full-year workers, as defined above.

Labor Hours. — It is suggested that this pruning can be done very effectively and in a way most conducive to standardization by using as an ultimate base the actual number of hours (or, failing a record of labor hours, the number of days) put in during the period considered.

LABOR CHANGE RATES

Just as "turnover" is a misleading term for use in general reference to the phenomenon of labor instability, so the term "percentage" is equally confusing for use in measuring the extent of this phenomenon. We know exactly the extent of the replacement necessary to maintain the normal work force when we know, let us say, that replacements took place in any given concern at the rate of 2 for each full-year worker in the normal work force. In other words, the phrase "rate of replacement" accurately designates what "percentage of turnover" has been loosely used to express.[1]

Other items in the labor flow, and, indeed, its whole volume or flux, may be "rated" in a similar fashion. The rate at which employees leave may be called the separation rate, and the rate at which they are hired, the accession rate. Whichever of these two rates is the lower may, for all practical purposes, be used as the replacement rate. When the accession rate exceeds the separation rate, the difference between the two measures the labor increase rate. When the separation rate exceeds the accession rate, their difference measures the labor decrease rate. If the separation and accession rates are equal, either one may, of course, be used as the replacement rate and there is naturally neither increase or decrease, the concern in question being neither expanding nor curtailing operations. The rates of increase and decrease may be considered as marginal rates in relation to the replacement rates, the increase rate measuring the amount, if any, of inflow over and above replacement inflow and the decrease rate measuring the amount, if any, of outflow over and above the outflow which has to be (and sooner or later is) replaced. The

[1] The phrase "percentage of turnover" has also been used to express "the ratio of the total number of separations . . . to the average number of employees on the force report." — *Standard definition of labor turnover and method of computing the percentage of labor turnover*, National Conference of Employment Managers, Rochester, New York, May 9 to 11, 1918, 6 *Monthly Labor Review* 1534–1535 (June, 1918).

accession rate plus the separation rate gives the total rate of labor change — a single rate of labor flux on the basis of which the mobility of labor in one occupation, shop, industry, or locality may be compared with its mobility in any other occupation, shop, industry, or locality. These different types of labor mobility or labor change rates may be classified as follows:

1. Accession rate (or hiring rate)
2. Separation rate { quitting rate (leaving voluntarily); discharge rate ("firing" rate); lay-off rate }
3. Replacement rate (separations minus excess of separations over accessions). This is the "turn-over" rate.
4. Labor increase rate (accession rate minus separation rate)
5. Labor decrease rate (separation rate minus accession rate)
6. Flux rate (accession rate plus separation rate) [1]

If there is no excess of separations over accessions, that is to say, if the separations exactly equal, or are exceeded by, the accessions, the number of separations, as it stands, represents the number of replacements. It is evident, then, that whichever number — accession or separation — is the smaller must represent the number of replacements. It should be very carefully observed, however, that serious error may result when the attempt is made in this fashion directly to deduce the number of replacements from the accession and separation figures when these figures represent the aggregate of several establishments or even, in some cases, of several groups (departmental, occupational, etc.) within a single establishment. Thus, for example, in Table 7 it is evident that the 86,179 separations which took place in the 16 plants in 1910, although, as compared with the 90,408 accessions, they would come much nearer to the number

[1] The use of the expressions "labor flux," "labor increase," and "labor decrease" has been suggested to the writers by Lucian W. Chaney, of the United States Bureau of Labor Statistics. Mr. Chaney has also suggested the term "industrial rates" for use in general reference to labor mobility rates, accident rates, etc. The authors wish to take this opportunity to express their indebtedness to Mr. Chaney in the whole subject-matter of this chapter.

of replacements, are in all probability considerably above it, since it is likely that in some of the 16 establishments the separations exceeded the accessions — in other words, contained non-replacement changes. The only method of obtaining absolute accuracy in regard to replacements is to segregate in a separate column the replacement numbers (whichever is smaller, accessions or separations) for each labor group (whether occupation, department, sex, plant, or locality) for which figures are shown, add the replacement numbers for each group, and figure the replacement rate independently on the basis of the total thus obtained. It is evident, of course, that in such a case as that of Table 3, where the work force of a single plant is taken as a unit, the replacement rates may be directly deduced as indicated in the formula.

The marginal flow, mentioned above, made up of excess hirings or excess separations, as the case may be, is not without importance. It is not labor replacement, however. Its importance, so far as force maintenance is concerned, is quite secondary. As a contributing or causal factor in unemployment in general, it is of vital importance both to the employing firm and to the community. Consider, for the moment, not merely the labor replacement involved in the establishment's force maintenance, but its labor mobility situation as a whole. As already noted, this total stability situation is best represented by the sum of the accession and separation rates. This includes not only the accessions and separations which are replaced (and which form the basis of the replacement rate), but also any possible marginal flow (of excess recruits or "quitters"[1]) expressed in the form of labor increase or decrease rates, as the case may be. This total establishment flow, as already intimated, is perhaps the best single index to the general labor stability situation in any establishment and to its standing as compared with other establishments. This total flux figure is quite readily ascertainable and it can easily be computed.

[1] The word "quitters" is used in these pages in the sense of "terminating" and refers to all employees leaving service, for whatever reason.

From the standpoint of the employee, labor mobility means irregular employment and unemployment. In the present work we are not primarily concerned with unemployment as a community problem or as a personal employee problem; we are concerned with it simply as an establishment problem. The primary purpose of this analysis is to gauge the labor flow into and out of the factory, including that part of the labor flow which (necessarily or unnecessarily) is involved in the maintenance of the normal work force — the phase of labor mobility here referred to as "labor replacement," "or labor turnover." These terms express the employers' professional interest in unemployment as a phenomenon of the labor flow — into and out of his establishment. Quite naturally, he is more concerned about the number of men it is necessary to hire to keep the establishment going than he is about the number of days unemployed individuals may be out of work each year.

SUGGESTED CHANGES IN COMPUTATION PRACTICE

It is here proposed to make certain definite changes in computation practice in regard to all the factors entering into the measurement of the labor flow:

1. As to the relatively more variable factor — the ebb and flow of industrial labor — it is suggested that it be measured by (*a*) making use of accessions as well as separations, (*b*) from the relation between these two more or less accurately gauging the replacements, and (*c*) adding accessions to separations, thus showing the labor flux.

2. As to the relatively constant factor, or base — the normal or standard working force — it is proposed to use, instead of the average number on the pay roll, the number of 3000-hour (or 300-ten-hour-day) workers to which the total hours (or days) put in during the period are calculated to be equivalent.[1] This

[1] The 3000-hour basic year is a more or less arbitrary standard amount of employment, taken as being roughly equivalent to the amount of labor time normally put in by the average fully employed industrial employee. It is not meant to discount the very real advantages of the eight-hour day.

TABLE 2

TREND OF LABOR FLUX, ACCESSION, CLASSIFIED SEPARATION, AND REPLACEMENT RATES IN A METAL-PRODUCTS MANUFACTURING PLANT (ESTABLISHMENT NO. 42–182),[1] BY MONTHS, FROM 1912 TO 1919

YEAR ENDED WITH	AVERAGE NUMBER OF FULL-YEAR WORKERS	MOVING ANNUAL RATES PER FULL-YEAR WORKER				
		LABOR FLUX (SEPARATIONS PLUS ACCESSIONS)	TOTAL ACCESSIONS[2]	CLASSIFIED SEPARATIONS		
				TOTAL[2]	LEFT VOLUNTARILY	LAID OFF	DISCHARGED
December 31, 1912	1,088	4.10	2.20	1.90*	1.23	.43	.25
January 31, 1913	1,114	4.21	2.28	1.93*	1.28	.40	.26
February 28	1,138	4.18	2.22	1.97*	1.31	.41	.25
March 30	1,158	4.05	2.14	1.91*	1.24	.42	.25
April 30	1,174	3.96	2.08	1.88*	1.21	.41	.25
May 31	1,185	3.96	2.09	1.88*	1.21	.42	.24
June 30	1,214	3.98	2.18	1.80*	1.28	.27	.24
July 31	1,241	4.03	2.05	1.97*	1.29	.44	.24
August 31	1,245	4.02	2.04	1.98*	1.27	.46	.24
September 30	1,248	3.98	2.02	1.96*	1.26	.46	.24
October 31	1,258	4.03	2.04	1.99*	1.24	.49	.26
November 30	1,264	3.91	1.96	1.95*	1.21	.48	.26
December 31	1,262	3.68	1.81*	1.87	1.14	.47	.25
January 31, 1914	1,259	3.51	1.73*	1.78	1.07	.47	.24
February 28	1,262	3.43	1.70*	1.73	1.01	.47	.24
March 30	1,267	3.38	1.71	1.67*	.96	.47	.24
April 30	1,276	3.18	1.60	1.57*	.86	.49	.22
May 31	1,277	3.02	1.53	1.50*	.75	.53	.22
June 30	1,293	2.86	1.51	1.36*	.64	.50	22
July 31	1,299	2.96	1.49	1.48*	.61	.64	.22
August 31	1,293	2.89	1.39*	1.50	.51	.77	.21
September 30	1,279	2.81	1.33*	1.49	.49	.80	.20
October 31	1,260	2.68	1.26*	1.43	.46	.79	.18
November 30	1,252	2.70	1.26*	1.44	.45	.80	.18
December 31	1,234	2.58	1.16*	1.42	.44	.81	.16
January 31, 1915	1,217	2.55	1.17*	1.39	.42	.81	.16
February 28	1,197	2.50	1.12*	1.38	.41	.81	.15
March 30	1,176	2.40	1.07*	1.33	.39	.81	.12
April 30	1,152	2.31	1.01*	1.30	.39	.79	.12
May 31	1,136	2.12	.87*	1.24	.39	.75	.11
June 30	1,088	1.93	.68*	1.24	.36	.79	.09
July 31	1,053	1.70	.71*	.99	.38	.53	.07
August 31	1,049	1.60	.73*	.87	.42	.38	.07
September 30	1,050	1.63	.76*	.87	.44	.36	.07
October 31	1,050	1.62	.76*	.86	.46	.34	.07
November 30	1,047	1.59	.73*	.86	.50	.32	.05
December 31	1,047	1.91	1.00	.91*	.54	.31	.05

[1] Establishments numbered below 100 are those reported in the pre-war inquiry; those numbered above 100 were covered in the later investigation. Concerns carrying a double number, therefore, appeared in both investigations.

[2] The replacement rates are marked with an asterisk.

TABLE 2 — *Continued*

Year Ended with	Average Number of Full-year Workers	Moving Annual Rates per Full-year Worker					
		Labor Flux (Separations plus Accessions)	Total Accessions [1]	Classified Separations			
				Total [1]	Left Voluntarily	Laid Off	Discharged
January 31, 1916	1,062	2.45	1.31	1.14*	.76	.32	.07
February 29	1,091	2.93	1.60	1.32*	.92	.31	.09
March 30	1,111	3.36	1.78	1.58*	1.17	.30	.11
April 30	1,128	3.97	2.08	1.89*	1.49	.29	.11
May 31	1,152	4.64	2.43	2.21*	1.80	.29	.12
June 30	1,188	5.02	2.70	2.32*	2.00	.18	.14
July 31	1,225	5.22	2.75	2.47*	2.17	.13	.16
August 31	1,249	5.59	2.95	2.65*	2.35	.12	.18
September 30	1,281	5.90	3.09	2.81*	2.52	.10	.19
October 31	1,314	6.28	3.32	2.97*	2.67	.10	.20
November 30	1,355	6.67	3.60	3.08*	2.77	.09	.21
December 31	1,392	6.63	3.45	3.18*	2.88	.09	.21
January 31, 1917	1,406	6.40	3.25	3.15*	2.86	.08	.20
February 28	1,413	6.33	3.20	3.12*	2.85	.08	.20
March 30	1,433	6.35	3.25	3.10*	2.83	.07	.20
April 30	1,456	6.27	3.21	3.06*	2.79	.07	.20
May 31	1,463	6.21	3.15	3.06*	2.78	.08	.20
June 30	1,466	6.20	3.15	3.05*	2.79	.06	.20
July 31	1,489	6.47	3.36	3.11*	2.90	.03	.19
August 31	1,515	6.78	3.55	3.23*	3.02	.03	.18
September 30	1,536	7.03	3.69	3.35*	3.13	.03	.19
October 31	1,563	7.05	3.68	3.37*	3.14	.04	.19
November 30	1,588	6.93	3.57	3.36*	3.13	.04	.20
December 31	1,606	6.83	3.49	3.33*	3.08	.06	.20
January 31, 1918	1,625	6.73	3.45	3.28*	3.02	.06	.20
February 28	1,634	6.64	3.36	3.28*	3.03	.06	.18
March 30	1,637	6.57	3.30	3.27*	3.04	.06	.17
April 30	1,636	6.48	3.29	3.19*	2.95	.07	.17
May 31	1,651	6.23	3.13	3.10*	2.87	.07	.17
June 30	1,641	6.07	3.02*	3.05	2.83	.07	.16
July 31	1,645	6.04	3.09	2.95*	2.73	.06	.16
August 31	1,652	5.76	2.90	2.86*	2.62	.07	.17
September 30	1,654	5.70	2.86	2.84*	2.60	.07	.17
October 31	1,642	6.08	2.81*	3.28	2.65	.46	.17
November 30	1,591	6.42	3.08*	3.34	2.67	.51	.16
December 31	1,560	6.59	3.26*	3.33	2.67	.49	.17
January 31, 1919	1,547	6.77	3.40	3.37*	2.70	.49	.19
February 28	1,530	6.75	3.34*	3.41	2.67	.54	.20
March 30	1,512	6.55	3.21*	3.34	2.56	.56	.22
April 30	1,475	6.39	3.01*	3.38	2.47	.67	.25

[1] The replacement rates are marked with an asterisk.

number may be derived from the labor-time records or, failing such records, the daily attendance records or wages and salary-account records, as explained in another section of this chapter. This standard base will be called for convenience "the equivalent full-year worker" or, more briefly, "the full-year worker."

3. It is then proposed, in place of the rate of gross separation per 100 in attendance or the rate of gross accession per 100 on the pay roll (both so-called "turnover percentages"), to use as a double index of the shifting involved in labor maintenance and of the extent, as well, of labor increase and labor curtailment, the rates of accession and separation per equivalent full-year worker, and as an index to the general stability situation the total labor flux rate per full-year worker, the "full-year worker" being a standard unit, the number of which is obtained by dividing the total number of hours (or days) worked during the period considered by the 3000 hours (or 300 days) of a standard working year. The rate is arrived at by dividing the number of labor changes (of whatever kind) by the number of "full-year workers." As will be explained in another part of this chapter, not only these accession and separation rates, but the labor replacement, labor increase, labor decrease, and total labor flux rates each can be computed separately and their general trend and relations to each other readily charted in graphic form.

The whole significance of the use of replacements rather than gross separations as an index of labor flux, as well as the relation between the accession, separation, and replacement rates, is best brought out by the use of data showing the average number of employees and the number hired and leaving by months over a fairly long period. This will give some notion as to the trend of accessions, separations, and replacements. Such illustrative data are contained in Table 2.

The figures presented are from a metal products manufacturing establishment in the Middle West. They show for the twelve-

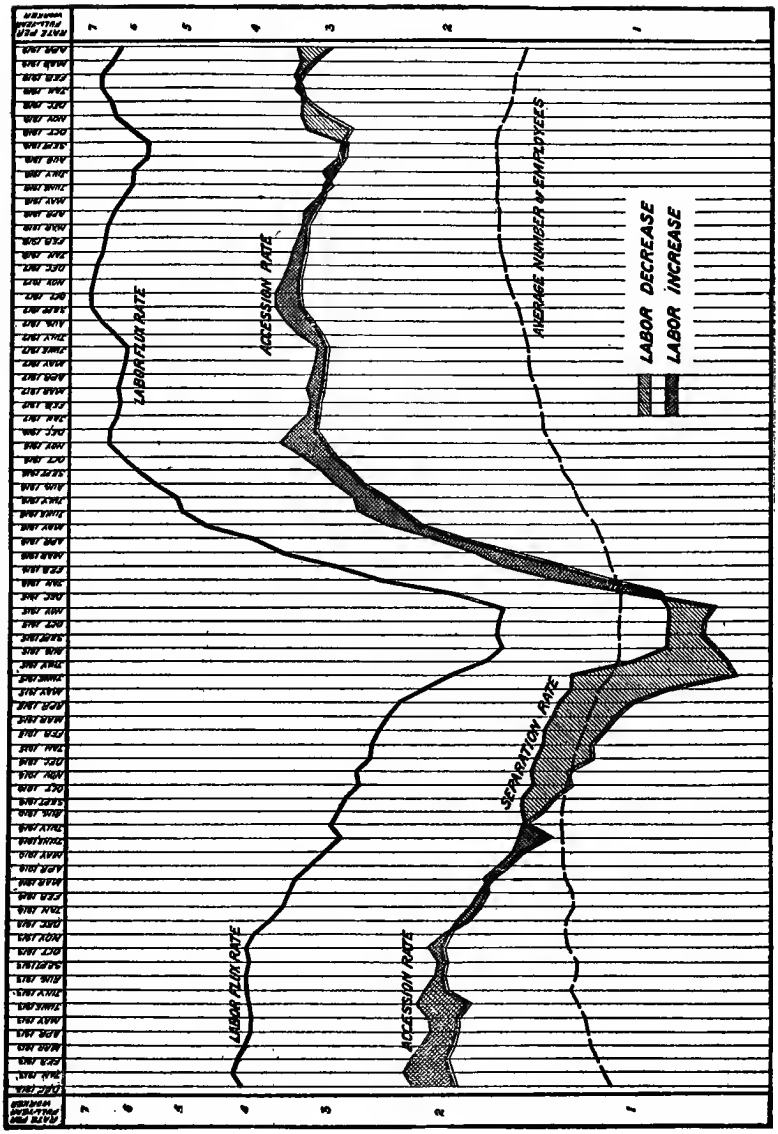


CHART A. TREND OF LABOR MOBILITY RATES IN A METAL-PRODUCTS MANUFACTURING PLANT, FROM JANUARY, 1912, TO APRIL, 1919

(Units: One labor change per full-year worker; One thousand employees; Logarithmic scale of ordinates.)

month periods indicated the rates of labor change (flux, accession, and classified separation) per full-year worker. They are, in other words, "smoothed" rates derived (by the method of moving averages) from the actual rates for each month, which latter in turn are computed by dividing the actual number of labor changes of each particular kind that occurred during each month (the variable) by the number of full-year workers[1] employed during that month (the base). Thus, e.g., the figure 2.20 at the top of the accessions column is the accession rate for the twelve-month period ending December 31, 1912, and the figure 2.28 is the rate for the twelve-month period ending January 31, 1913, etc. Replacement rates among total separations and accessions are indicated by asterisks.

The moving annual labor change rates given in Table 2 for the overlapping twelve-month periods are, with the exception of the classified separation rates, shown graphically in Chart A.[2]

The two curves marked "accessions" and "separations" tell the whole story. There are obviously two main movements. There was a distinct downward movement — a movement toward greater stability — during the greater part of the four-year period, 1912–1915. The following four years — the years of the World War — witnessed a movement, quite precipitate at first, toward greater mobility. The accession and separation rates follow a roughly parallel course during the seven-year period. The average number of employees underwent a slight increase. The flux rate curve shows a form roughly corresponding, of course, to the trend of accessions and separations. It was 4.10 per full-year worker in 1912, 1.91 in 1915, and 6.39 in 1919. The replacement curve (marking the trend of the starred figures in Table 2) is shown on the chart by a line drawn parallel to a line

[1] That is to say, 3000-hour workers, as explained above.

[2] The chart was drawn by Mr. Leon Kirsch, formerly of the United States Bureau of Labor Statistics. Both the chart and Table 2 are reprinted by permission, from an article on "The Measurement of Labor Mobility," by P. F. Brissenden, 28 *Journal of Political Economy*, 454–455, 457 (June, 1920). The classified separation rates are plotted on Chart E on page 83.

connecting the lower points in the lines showing accessions and separations. It is evident that at the beginning of the period accessions were in excess, so that separations measured replacements, whereas at the end of the period the reverse relation held true and accessions consequently measured replacements.

In 1912 employees in this particular factory were being replaced at the rate of 1.90, in 1915 at the rate of 0.91, and in 1919 at the rate of 3.01 per full-year worker. Either the replacement curve or the flux curve would seem to serve quite well as single indices of the labor stability situation. The labor flux rate was cut down 54 per cent during the period from January 1, 1912, to December 31, 1915, but between the latter date and April 30, 1919, it underwent an increase of 235 per cent.

When the accessions are in excess of the separations, the factory is building up its force, and the extent to which they are in excess measures the amount of recruiting being done. When the separations, on the other hand, exceed the accessions, the factory must be cutting down its operations and reducing its force, and the margin by which the separations are in excess measures the amount of labor decrease. In the chart the dark shaded areas show the extent of labor increase and the light shaded areas the extent of labor decrease.

DEFINITION OF TERMS

The precise definitions of the different factors which have been discussed in the preceding pages may now be formulated and the method of computation described:

The Variables. — The whole phenomenon of the movement of labor into and out of industrial establishments is referred to here as "labor mobility."[1] Those hired are referred to as "accessions." Those leaving service, under whatever circumstances,

[1] The term "labor mobility" primarily connotes movement. From the employer's standpoint, however, it will sometimes be convenient to refer to it as instability, or even to use the word "stability" — where that word seems to be appropriate.

are referred to as "separations." Those of the accessions which are made to fill the vacancies made by separations are replacement accessions, or "replacements." Whichever one of the two items, accessions or separations, is the smaller may conveniently be taken as measuring the number of replacements. The total number of labor changes, that is to say, the sum of the accessions and separations, is the "labor flux." The amount by which the accessions in an expanding business are in excess of the separations is the amount of "labor increase." The amount by which the separations in a plant which is curtailing operations exceed the accessions is the amount of "labor decrease." Unless otherwise indicated in the context, the word "turnover," in this book, is used in reference to rate of replacement.[1]

The Base or Standard of Measurement. — As to the base or normal work force to which the number of labor changes, or the number of replacements, or accessions, etc., must be compared in order to show the frequency or rate of change, use is made of the aggregate number of hours actually worked by all employees for any period. This is a genuine standard base, inasmuch as it accurately represents the volume of employment, or the amount of industrial exposure. This base at once eliminates all inflation due to dead and broken-time names on the pay roll, thus putting establishments with varying amounts of employment on a par and making the strictest comparability possible.[2]

METHOD OF COMPUTATION

The exact method of measuring labor mobility used in this study is as follows: The general extent of labor mobility is statistically determined by comparing the total movement of

[1] The relations between accessions, separations, replacements, and flux may be seen from the tabular presentation of them all in Table 3. See above, p. 8, note 4.

[2] In the earlier studies of labor turnover made by the Bureau of Labor Statistics the average daily work force was first used as a base but was later changed to the full-year of 3000-hour worker. Finally, the Bureau decided to use the unit labor hour or some decimal multiple thereof. (10 *Mo. Lab. Rev.* 1344.)

labor in and out (accessions and separations) during any given period with the number of "fully-employed-worker" labor-time units of 3000 hours put in by the work force during that period. The number of labor changes, in other words, is compared with the number of full-year workers. This flux or total labor change rate is believed to constitute the best single index to the general stability situation in any plant or group of plants and in subdivisions within individual establishments. The flux rate is made up of the accession rate and the separation rate. The two latter rates should be shown separately in order to reveal the whole stability situation. The separation rate should be subdivided so as to show the relative responsibility for the labor outflow of discharges, lay-offs, and quits. The rate of replacement, which means the rate at which separating employees whose places must be filled are replaced by others, may be, for all practical purposes, defined as and identified with the rate of separation when that rate is lower than the accession rate and as the rate of accession when that rate is lower than the separation rate.[1] When the accession rate exceeds the separation rate, the difference between the two measures the labor increase rate. When the separation rate exceeds the accession rate, their difference measures the labor decrease rate. If the separation and accession rates are equal, either one may, of course, be used as the replacement rate and there is naturally neither increase nor decrease, the concern in question being neither expanding nor contracting. The rates of increase and decrease may be considered as marginal rates in relation to the replacement rates, the increase rate measuring the amount, if any, of inflow over and above replacement inflow and the decrease rate measuring the amount, if any, of outflow over and above the outflow which has to be (and sooner or later is) replaced.

The different mobility or labor-change rates are given in these pages as rates per full-year (or 3000-hour) worker. For illustration: The figures in Table 7 show that during the year ending

[1] See above, p. 13.

May 31, 1918, the sum total of accessions and separations for the 176 establishments reported was 1,244,640. The number of labor hours worked in these plants during this period was 917,703,000. Consequently the

Flux rate (per full-year worker) is . . . . . $\frac{1,244,640}{917,703,000} \times 3,000 = 4.80$

the *Accession* rate . . . . . $\frac{631,173}{917,703,000} \times 3,000 = 2.07$

the *Separation* rate . . . . . $\frac{613,467}{917,703,000} \times 3,000 = 2.01$

The rates for any departmental, occupational, or other subdivision of the work force can be figured in exactly the same way. Thus, for example, to get the accession rate divide the number hired for the particular department or occupation during the period covered by the number of labor hours worked in that department or occupation group during the period and multiply by 3000. It at once will be evident that the same results can be obtained in more direct fashion by simply dividing the number of labor changes by the number of full-year workers.

The meaning of all of these different phases of labor mobility and their relation to each other are brought out in a somewhat clearer fashion in Table 3 (presented here merely to throw light on method and terminology), which shows for the years 1917 and 1918 the rate per full-year worker of flux, accession, separation, replacement, labor increase and decrease, in an automobile manufacturing plant.

It is evident from these figures that in 1917 to maintain a labor force of 35,401 workers, who put in 106,203,000 labor hours, there were 14,827 separations. Of these 6863 represented curtailment — labor decrease. They were either lay-offs, discharges or quits taken advantage of to reduce the force, and not replaced. To make good the remaining 7964 separations, 7964 new workers were hired. There were, then, in that year 22,791 labor changes involved in the maintenance and curtailment of a work force of 35,401 persons. In 1918 the plant under-

went expansion, its labor increase rate being .07 per full-year worker. There were 24,349 separations, all of which had to be replaced. In addition, plant extension required a labor increase of 2223, making a total of 26,572 accessions. There were altogether in 1918 no less than 50,921 labor changes required to maintain and enlarge a work force of 31,911 and to get 95,733,000 hours of work done. In other words, in 1917 the accession rate was .23 and in 1918 it was .83 per full-year worker; the separation rate was .42 and. 76 in 1917 and 1918, respectively; the

TABLE 3

LABOR MOBILITY IN AN AUTOMOBILE MANUFACTURING PLANT (No. 48–194), SHOWING FLUX, ACCESSION, SEPARATION, REPLACEMENT, AND LABOR INCREASE AND DECREASE RATES FOR 1917 AND 1918 [1]

YEAR	AVERAGE DAILY ABSENTEES	NUMBER OF FULL-YEAR WORKERS	ACCESSIONS PLUS SEPARATIONS (FLUX)	ACCESSIONS	SEPARATIONS	REPLACEMENTS	LABOR INCREASE	LABOR DECREASE
	NUMBER							
1917 . . .	1,699	35,401	22,791	7,964	14,827	7,964	—	6,863
1918 . . .	1,340[2]	31,911	50,921	26,572	24,349	24,349	2,223	—
	RATE PER FULL-YEAR (3000-HOUR) WORKER							
1917 . . .	0.05	—	0.64	0.23	0.42	0.23	—	0.19
1918 . . .	0.04[2]	—	1.60	0.83	0.76	0.76	0.07	—

replacement rate .23 and .76, and the flux rate .64 and 1.60. In 1917 the establishment underwent curtailment at a rate of .19 (and in 1918 it underwent expansion at a rate of .07) per full-year worker. This means that when the accessions are in excess of the separations the factory is building up its force, and the extent to which they are in excess measures the amount of labor recruiting being done. When the separations, on the other hand, exceed the accessions, the factory evidently is cutting down its operations

[1] Taken by permission from article on "Measurement of labor mobility," 28 *Jour. Polit. Econ.* 444.

[2] Based on records for first six months only.

and reducing its force, and the margin by which the separations are in excess measures the amount of industrial demobilization going on in that factory.

RELATION BETWEEN DIFFERENT METHODS OF COMPUTATION

The relation between the two principal methods which have been used hitherto in labor turnover computation and the method followed in this book is shown in Table 4, in which the figures of methods II and III are derived from those of method I which are taken from Table 7. Separation rates in round numbers are given in parentheses:

TABLE 4

COMPARISON OF THREE METHODS OF MEASURING LABOR MOBILITY

PERIOD	ACCESSION	SEPARATION	FLUX
	I. RATE PER FULL-YEAR (3000-HOUR) WORKER		
1913–1914	.93	.99 (1)	1.92
1917–1918	2.07	2.01 (2)	4.08
	II. RATE PER 10,000 LABOR HOURS		
1913–1914	3.07	3.27 (3.3)	6.34
1917–1918	6.83	6.63 (6.6)	13.46
	III. "PERCENTAGE OF TURNOVER"[1] (So-called "Rochester" Method)		
1913–1914	—	99 (100)	—
1917–1918	—	201 (200)	—

A separation rate of 3.3 per 10,000 labor hours, as the Bureau of Labor Statistics now computes "turnover,"[2] or a separation rate (called, Rochester fashion, "percentage of turnover") of 100 per hundred on the work force, as the Bureau formerly figured "turnover," are both equivalent to a separation rate

[1] That is, the rate per 100 full-year workers (or employees on the pay roll).

[2] This is also the Bureau's official method of computing industrial accident rates. 10 *Monthly Labor Review*, 218–219 (January, 1920).

per full-year worker of 1.00 as used in these pages.[1] Conversely, a separation rate of 2.00 per full-year worker as used here is equivalent to a separation rate of 6.6 per 10,000 labor hours and to a "percentage of turnover" (Rochester formula) of 200. The flux rate on the new basis used here would be 2.00, which is the same as a flux rate of 6.6 per 10,000 labor hours. Such a rate indicates that during the period under observation the sum total of the number hired and leaving is equal to twice the number of full-year workers employed. When the accession and separation rates in any establishment each stand at or close to 1.00, thus giving a flux rate of 2.00, the situation in that plant is one equivalent to a complete overturn of the work force. But this complete work-force turnover flux rate of 2.00 may actually represent three distinctly different industrial situations, the revelation of which is one of the useful functions of accession and separation rates: (1) accessions 1.00, separation 1.00, a going concern which is neither expanding nor curtailing its operations; (2) accessions 1.50, separations .50, a concern which is undergoing more or less rapid extension of plant; and (3) accessions .50, separations 1.50, a concern which is curtailing activities. One or the other of these three different situations is involved in every rate of total labor change, whether it be in a very stable plant with a flux rate of 1.00 or a very unstable one with a flux rate of 4.00.

The fact should be emphasized that the primary object in gauging the extent of labor mobility is to ascertain the number of labor changes involved in the maintenance (and the necessary expansion or reduction) of the labor force. The number of different individuals involved in these changes is of less importance here than the number of repeated transactions. The computation method here used indicates the number of changes which take place, but it obviously involves double counting and does not, therefore, furnish a true report of the number of different persons

[1] The Bureau's rates (as published, e.g., in the *Monthly Labor Review* for June, 1920, pp. 36–56) may, therefore, be put upon a comparable footing with those given in this book by multiplying them by .3.

involved in the labor shiftings. The accession rate reported for a single concern is sure to include some employees who have been hired more than once during the period covered by the figures. The same is true of the separation rate and the flux rate. The figures for a group of establishments may also contain the accessions of certain employees whose separations are included, as they should be, in the separation figures for the same group. It is important to observe that this double counting does not affect the accuracy of figures designed to show merely repeated transactions. Moreover, since the concerns here reporting are widely scattered geographically and well distributed as to industry, there would not be likely to be many employees shifting from job to job within the group of firms reported. That is to say, when a worker left one of these plants the chances would be heavily against his being taken on by one of the other firms in this small group. But if he is so taken on, he is rightly to be counted twice, since he has made two labor changes.[1]

[1] For more detailed treatment of this widely discussed problem of the measurement of labor turnover see: "Computing Labor Turnover: a Questionnaire," 56 *Industrial Management*, 239–246 (September, 1918); Doten, Carroll W., "Computing Labor Turnover," 56 *Industrial Management*, 339 (October, 1918); Emmet, Boris, "The Nature and Computation of Labor Turnover," 27 *Journal of Political Economy*, 105–116 (February, 1919); Crum, F. S., "How to Figure Labor Turnover," 16 *Quarterly Publications of the American Statistical Association*, 361–373 (June, 1919); Douglas, Paul H., "Note on Methods of Computing Labor Turnover," 9 *American Economic Review*, 402–405 (June, 1919); Slichter, S. H., "The Scope and Nature of the Labor Turnover Problem," 34 *Quarterly Journal of Economics*, 329–345 (February, 1920); and Brissenden, P. F., "The Measurement of Labor Mobility," 28 *Journal of Political Economy*, 441–476 (June, 1920).

CHAPTER III

Personnel Policy and Labor Stability[1]

A very effective illustration of the practical usefulness of labor mobility figures is furnished in a comparison of the mobility experience of ten selected establishments with that of all other establishments reporting. The labor flux rates in each of the ten selected plants are shown for the period 1913–1919 in Table 5. For convenience in making comparisons the corresponding flux rates for all establishments reporting are given in the last column.

A more complete exhibit of the two groups of concerns compared in Table 5 is given in Table 6, which places side by side for each year of the seven-year period the rates of accession, separation, and flux in (1) the ten selected establishments and (2) all establishments reporting. The labor flux rates of Table 6 are shown graphically in Chart B.

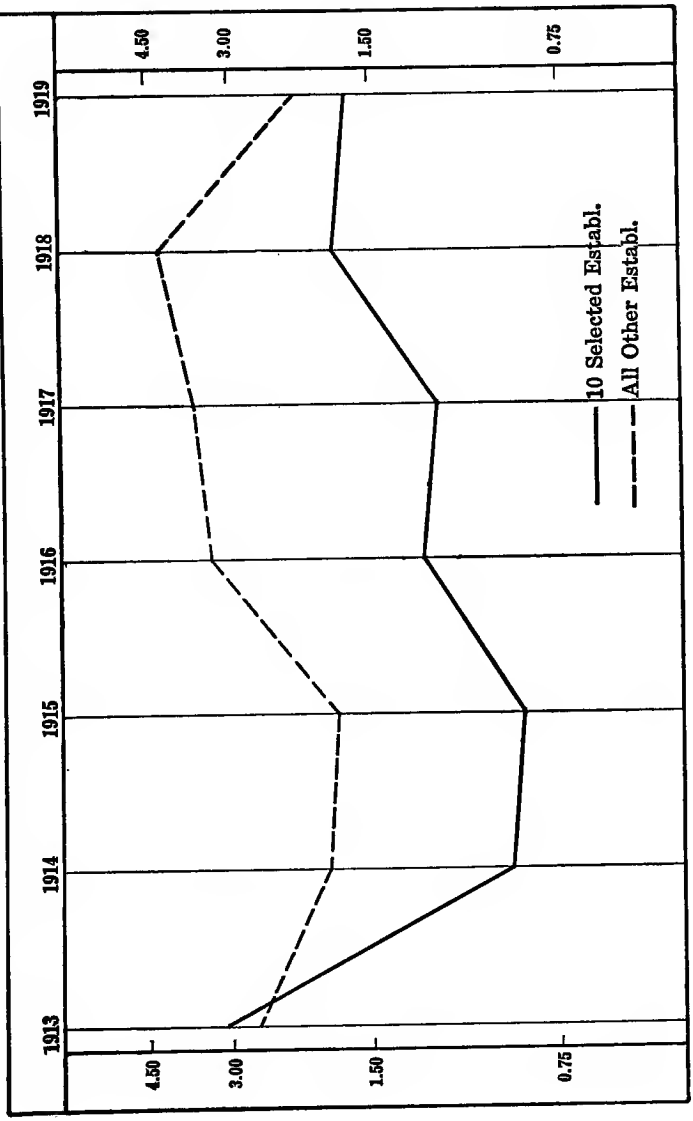
The ten concerns whose records are set forth in Tables 5 and 6 were chosen not only because they had definite labor policies and centralized employment machinery, but also on account of the fact that they had had considerable success in stabilizing their work forces and keeping their labor mobility rates down to relatively low levels. The figures demonstrate, so far as it is possible

[1] For a valuable discussion of different employment methods and their effect upon labor stability, see Sumner H. Slichter, *The Turnover of Factory Labor* (New York, 1919). See also Kelly, R. W., *Hiring the Worker* (New York, 1918) and Colvin, F. H., *Labor Turnover, Loyalty and Output* (New York, 1919). The following articles describe in detail the methods used in certain establishments which have successfully applied modern employment practices: "Labor Turnover and Employment Policies of a Large Motor-vehicle Manufacturing Establishment," by Boris Emmet, *Monthly Labor Review*, October, 1918; "Employment Policy and Labor Stability in a Pacific Coast Department Store" and "Employment Policies and Labor Mobility in a California Sugar Refinery," by P. F. Brissenden, *Monthly Labor Review*, November and December, 1919.

to demonstrate such things in statistical terms, the definite effectiveness of liberal labor policies and more or less centralized systems of employment. The curves of Chart B show in striking fashion that the ten selected establishments have brought about a considerable reduction in the extent of their labor shift and have suffered a much slighter decrease in stability during the war period than did the general run of establishments. It appears from the figures of Table 6 that for the whole period, 1913–1919, the 10 selected concerns had an average labor flux rate of 1.53 as compared with a rate of 2.25 for all other concerns. The selected plants reduced their flux rates from 3.27 in 1913 to 1.68 in 1919, but were forced up to 1.83 in 1918, which was the highest point reached after 1913. Establishments generally began with a rate of 2.61 in 1913, were pushed in 1918 up to 4.08 (over twice the mobility experienced by the selected concerns), and finished in 1919 with a rate of 2.10. This comparison of achievements, which covers a relatively long period, shows the vital importance from the standpoint of the industrial establishment of studying this subject of labor mobility, the necessity of examining the employment and personnel methods currently practiced by the more far-sighted employers, and the desirability of keeping systematic and continuous employment records in order to gauge the effect of labor policy upon labor stability. It demonstrates, as well, the urgent need for the more widespread adoption by employers generally of such labor and employment policies as will be most effective in eliminating from industrial life the evil and the waste of unnecessary hiring and firing.

Scientific employment, like high wages, in the long run is an economy. It is less expensive to keep trained, experienced men than it is to hire new and untrained ones. Policies of wholesale lay-off and indiscriminate discharge are very costly. In boom times or bad it pays to conserve human as well as material resources, to put just as much thought and technique into hiring and utilizing men as is given to the purchase and elaboration of raw materials.

CHART B. COMPARISON OF LABOR FLUX RATES PER FULL-YEAR WORKER IN TEN SELECTED ESTABLISHMENTS WITH CORRESPONDING RATES IN ALL OTHER ESTABLISHMENTS REPORTING, 1913–19.
(Unit: One labor change per full-year worker; Logarithmic scale of ordinates.)



TABLE

LABOR FLUX RATES IN TEN
By years, from 1913

YEAR	FLUX RATE PER FULL-YEAR WORKER[1]						
	48 (AUTOMOBILE MANUFACTURING)	71 (MACHINERY MANUFACTURING)	35 (MACHINE TOOL MANUFACTURING)	29 (VALVES AND FITTINGS MANUFACTURING)	73 (CASH REGISTERS MANUFACTURING)	39 (MEN'S CLOTHING MANUFACTURING)	14 (BOOK MANUFACTURING)
1913	8.40	2.63	2.97	1.08	2.40	1.32	.66
1914	1.05	1.17	1.74	.33	1.02	.93	.54
1915	.96	1.05	2.70	.54	.90	1.53	.33
1916	1.02	1.74	3.72	1.83	2.49	1.62	.84
1917	.63	3.03	3.27	1.80	3.03	2.25	1.17
1918	1.38	2.76	3.18	1.89	4.89	2.43	1.95
1919	1.77	1.17	1.83	1.62	3.21	1.77	1.47

[1] I.e., a 3000-hour worker.

TABLE

COMPARISON OF LABOR MOBILITY IN TEN SELECTED ESTABLISHMENTS THE YEARS 1913

YEAR	TEN SELECTED ESTABLISHMENTS					
	NUMBER OF ESTABLISHMENTS	FULL-YEAR WORKERS	LABOR HOURS (THOUSANDS)	LABOR CHANGES		
				ACCESSIONS	SEPARATIONS	FLUX
1913	10	43,515	130,545	69,902	71,390	141,292
1914	10	32,758	98,274	10,952	14,824	25,776
1915	10	45,197	135,591	21,273	10,223	31,496
1916	10	56,508	169,524	44,477	23,882	68,359
1917	10	61,434	184,302	31,127	35,073	66,200
1918	10	59,194	177,582	59,660	47,673	107,333
1919	10	71,559	214,677	69,334	51,359	120,693
Whole period		370,165	1,110,495	306,725	254,424	561,149
				RATE PER FULL-		
1913				1.62	1.65	3.27
1914				.33	.45	.78
1915				.48	.24	.72
1916				.78	.42	1.20
1917				.51	.57	1.08
1918				1.02	.81	1.83
1919				.96	.72	1.68
Whole period				.84	.69	1.53

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SELECTED ESTABLISHMENTS
to 1919, inclusive

IN ESTABLISHMENT NUMBER:—			FLUX RATE PER FULL-YEAR WORKER IN:—		YEAR
7 (DEPARTMENT STORE)	16 (ELEVATED RAILWAY)	278 (STREET RAILWAY)	THE TEN ESTABLISMENTS COMBINED	ALL ESTABLISHMENTS REPORTED FOR CALENDAR YEARS SPECIFIED	
1.29	.75	.27	3.27	2.61	1913
.90	.90	.12	.78	1.77	1914
1.14	.18	.06	.72	1.68	1915
1.65	.45	.45	1.20	3.21	1916
1.38	.78	.69	1.08	3.45	1917
1.26	1.23	1.71	1.83	4.08	1918
1.05	1.02	.63	1.68	2.10	1919

6

WITH ITS MOBILITY IN ALL OTHER ESTABLISHMENTS REPORTING FOR
TO 1919, INCLUSIVE

ALL OTHER ESTABLISHMENTS REPORTING						YEAR
NUMBER OF ESTABLISHMENTS	FULL-YEAR WORKERS	LABOR HOURS (THOUSANDS)	LABOR CHANGES			
			ACCESSIONS	SEPARATIONS	FLUX	
103	355,934	1,067,802	471,844	463,728	935,572	1913
152	340,529	1,021,587	289,169	311,931	601,100	1914
41	113,857	341,570	100,938	89,511	190,449	1915
9	25,270	75,809	46,781	33,824	80,605	1916
18	32,019	96,057	56,124	54,393	110,517	1917
20	29,128	87,386	64,830	54,336	119,166	1918
10	14,592	43,778	15,925	14,866	30,791	1919
	911,329	2,733,989	1,045,611	1,022,589	2,068,200	Whole period

YEAR (3000-HOUR) WORKER

1.32	1.29	2.61	1913
.84	.93	1.77	1914
.90	.78	1.68	1915
1.86	1.35	3.21	1916
1.74	1.71	3.45	1917
2.22	1.86	4.08	1918
1.08	1.02	2.10	1919
1.14	1.11	2.25	Whole period

CHAPTER IV

General Extent of Labor Mobility

Labor mobility, as already has been pointed out, varies with current industrial conditions, and changes in these conditions naturally influence the extent of the flow of labor into and out of our industrial plants. What effect these alternating periods of prosperity and depression have upon the extent of accessions and separations themselves, disregarding for the moment the particular kind of establishment or its location, may be briefly summarized somewhat as follows: In a rising labor market many new employment opportunities are created, which means that jobless workers get jobs and many employed workers leave their jobs and take employment elsewhere, ostensibly to better their industrial situation. Because of the urgency of the work it becomes necessary to replace quickly those employees who have left. The rapidity with which employees leave their jobs and the extent to which job changes take place will depend upon the extent to which industrial operations are enlarged and how favorable an employment situation is thus created. The more favorable the employment situation, the larger the number of accessions. These, of course, in addition to those hired from among the unemployed, are the cause of an increase in the number of separations from other plants, where, in turn, additional replacement accessions are required. Through the single fact that employees leave their jobs in rapid succession constantly increasing employment opportunities are created, thus increasing both accessions and separations.[1]

When there is extensive industrial activity and considerable

[1] The fact that labor turnover is heaviest in periods of prosperity partially explains the existence in such periods of the so-called "irreducible minimum of unemployment."

competition for labor, the process of selection in industrial establishments also considerably accelerates the frequency of labor shifting. It is obvious that when an establishment is rapidly increasing its work force in a tight labor market it cannot usually make a very careful examination of the fitness of a particular applicant for the job. During such times it is also possible that people are taken on who in normal times would not be hired at all. After these people actually begin to work in an establishment, however, a good many of them will be found to be unfit or undesirable and after a longer or shorter period of service are let go. This selective process is, of course, greatly intensified in times of unusual industrial activity, when there is a scarcity of labor. All this involves an increase in the number of both accessions and separations far above the ordinary number, which is already unnecessarily large.

In periods of industrial depression, when there are considerably fewer job opportunities relatively to the labor supply and the number of available job opportunities is diminishing, there will take place at first a considerable number of forced separations (lay-offs and discharges); there will be, moreover, fewer voluntary separations. There will be practically no occasion for accessions to build up force and much less need for accessions for replacement, inasmuch as most of the jobs abandoned are being at least temporarily discontinued. While under these circumstances the number of separations may at first be considerable, the whole number of separations over the entire period of depression and the sum total of labor changes during that period will on the whole be much less.

The enormous proportions that labor mobility may assume will be appreciated from an examination of Table 7.[1] In this

[1] Taken, after shifting the rates to the full-year-worker basis, from the writers' report on "The Mobility of Labor in American Industry," 10 *Mo. Labor Rev.* 1347 (June, 1920).

TABLE 7

LABOR MOBILITY, BY YEARS, 1910–1919

[Replacement (or "turnover") numbers and rates are marked by asterisks (*)]

YEAR	NUMBER OF ESTABLISHMENTS	NUMBER OF FULL-YEAR WORKERS[1]	TOTAL LABOR HOURS (THOUSANDS)	LABOR CHANGES		
				ACCESSIONS	SEPARATIONS	TOTAL (FLUX)
	NUMBER					
1910 . .	16	85,263	255,789	90,408	86,179*	176,587
1911 . .	24	109,653	328,959	94,029*	96,915	190,944
1912 . .	54	188,363	565,089	210,085	182,287*	392,372
1913 . .	113	399,449	1,198,347	541,746	535,118*	1,076,864
1913–14[2] .	84	244,814	734,442	227,008*	243,707	470,715
1914 . .	162	373,287	1,119,861	300,121*	326,755	626,876
1915 . .	51	159,054	477,162	122,211	99,734*	221,945
1916 . .	20	94,803	284,409	131,300	101,102*	232,402
1917 . .	27	58,052	174,156	79,287	74,917*	154,204
1917–18[2] .	176	305,901	917,703	631,173	613,467*	1,244,640
1918 . .	29	56,411	169,233	97,918	84,999*	182,917
1919 . .	19	42,632	127,896	38,751	36,100*	74,851
Total .		2,117,682	6,353,046	2,564,037	2,481,280*	5,045,317
	RATE PER FULL-YEAR (3000-HOUR) WORKER[3]					
1910 . .				1.05	1.02*	2.07
1911 . .				.86*	.88	1.74
1912 . .				1.11	.96*	2.07
1913 . .				1.35	1.34*	2.69
1913–14[2] .				.93*	.99	1.92
1914 . .				.81*	.88	1.69
1915 . .				.78	.63*	1.41
1916 . .				1.38	1.08*	2.46
1917 . .				1.38	1.29*	2.67
1917–18[2] .				2.07	2.01*	4.08
1918 . .				1.74	1.50*	3.24
1919 . .				.90	.84*	1.74
Total .				1.20	1.17*	2.37

[1] The figures in column headed "Number of full-year workers" in this and following tables in this book are obtained by dividing the total labor hours by 3000. These figures are given simply to indicate the approximate size of the work force to make it possible directly to compare the absolute number of labor changes with the number of employees in the work force.

[2] The figures given for 1913–14 and 1917–18 are from establishments reporting in great detail during the two field investigations of this subject made by the Bureau of Labor Statistics in 1915 and 1918. The time covered by the statistical data from these establishments is a 12-month period ending usually about the middle of 1914 and 1918, respectively. This applies to the material shown for these dates throughout this book.

[3] Computed, as already explained, by dividing number of labor changes by the total number of labor hours and multiplying by 3000. The same results, of course, will be obtained by dividing the labor-change numbers by the corresponding numbers of full-year workers.

table the combined figures for the years 1910 to 1919 show that in the establishments reporting the accomplishment of 6,353,046,000 hours of work, which is labor time equivalent to that of 2,117,682 full-year (3000-hour) workers, there were entailed 2,564,037 accessions and 2,481,280 separations, or a total of 5,045,317 labor changes. In other words, on the average, for each year of the decade 256,404 accessions, 248,128 separations, or a total of 504,532 labor changes were involved in the maintenance, and the necessary enlargement or curtailment, of a labor force of 211,768 workers. This means that the maintenance and necessary expansion or curtailment of the requisite work force involved labor changes considerably more than equivalent to a complete annual overturn of the work force. This is as if during one year all the employees had left their jobs and a complete new set of work people had taken their places. It appears then that each year on the average the number of persons who quit, were laid off, or discharged, as well as the number who had to be hired, was much larger than the total number of workers on the force at any one time.

The separation rate figures in Table 7 and almost invariably throughout the book are set in bold-face type.[1] An examination of these figures together with the accession and flux rates (bearing in mind the fact that a flux rate of 2.00 represents a complete overturn of the force) will show that in five of the ten calendar years represented the number of labor changes in the plants re-

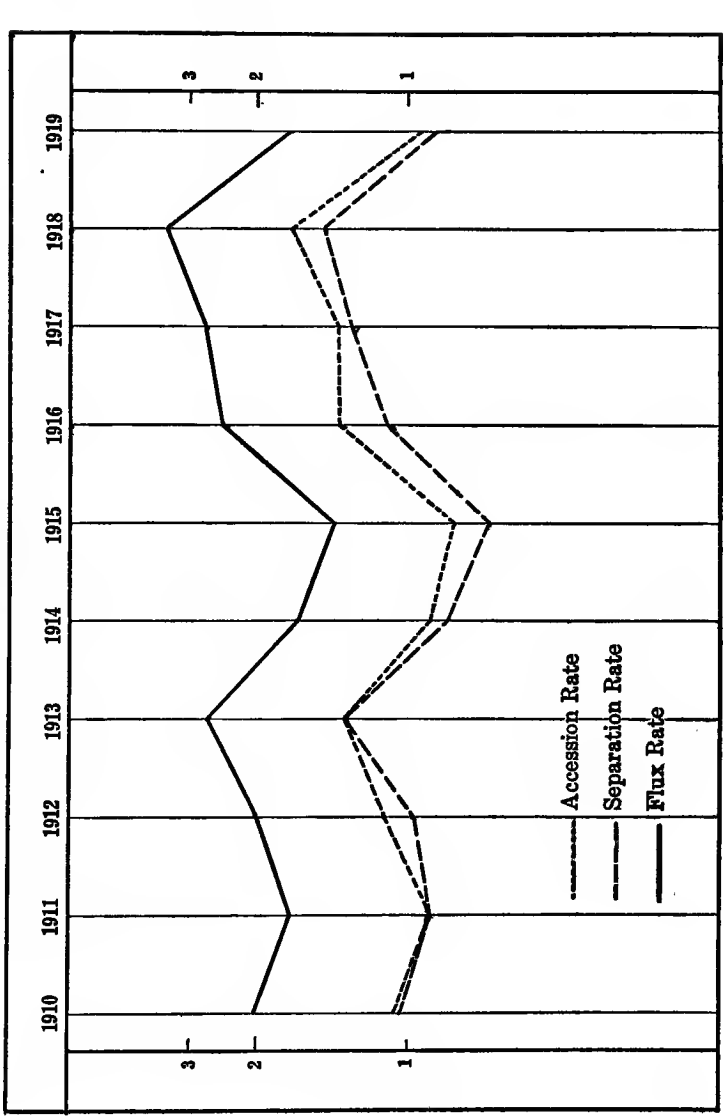
[1] This is done, not so much because of any special importance attaching to separations as compared with accessions or flux, but in recognition of the wide prevalence of the conception of separations as turnover and the common habit among employers and employment managers of speaking of the "percentage of turnover" as signifying the number of separations per hundred employees. Since the rates per full-year worker, as computed in these pages, are so figured as to show two decimals, it at once will be evident that the separation rates may be read directly as "percentages of turnover" by the simple expedient of omitting the decimal point. Thus, in Table 7, a separation rate of 1.02 in 1910 is the same as a turnover percentage of 102. The same method of translation is just as feasible for those who, when they say "percentage of turnover," mean the number of replacements per hundred employees.

porting has been more than equivalent to a complete overturn of the work force; that is, there were at least as many accessions and at least as many separations as there were workers on the force. Even in 1915, the most stable year of the decade, there were 122,211 accessions and 99,734 separations entailed in the maintenance and enlargement of a work force of 159,054 employees. This is equivalent to a complete overturn of not less than 63 per cent of the work force during the year. In 1917–18, the most unstable of the periods shown, 631,173 accessions and 613,467 separations, or a total of 1,244,640 labor changes were involved in the maintenance and enlargement of a work force of 305,901 workers. This is equivalent to more than two complete overturns of the work force during the year.

On the basis of the unit full-year (3000-hour) worker the situation in the decade reported may be described as follows: Throughout the ten-year period, for every equivalent 3000-hour worker in the aggregate work force, there were on the average more than two labor changes per year. In 1915, the period of least instability, there were about one and a half labor changes for each full-year worker. In the war period 1917–18 there were more than four labor changes for each full-year worker in the aggregate work force. This is as if during these twelve months all the employees had left their jobs, an entirely new set had come in to fill their places, and afterwards all the employees in this second set had left their jobs and had in turn been fully replaced by a third set of workers.

There is also to be observed in Table 7 a very definite tendency of the mobility rates to vary with the prevailing industrial situation. This tendency is brought out in graphic form in Chart C, on which are plotted the mobility rates shown in Table 7. The influence of the prevailing business and industrial situation is indicated in the chart by the relatively high mobility rates for the years 1913 and 1917–18, years of great industrial activity, and by a recession in the rates in years in which the industrial situation has been less favorable.

CHART C. LABOR MOBILITY RATES BY YEARS, 1910–19
(Unit: One labor change per full-year worker; Logarithmic scale of ordinates.)



Enormous as is the extent of establishment labor instability indicated by these figures, it is fair to assume (and this assumption is supported by a good deal of fragmentary evidence) that the actual situation is even worse. It is especially probable that the labor mobility for the year 1919 is actually higher than is indicated by the figures shown here, since the number of establishments upon which the rates are based is rather small and includes several establishments with unusually low labor mobility records. The (nearly) 500 establishments from which the Bureau of Labor Statistics secured labor mobility figures have necessarily been the concerns which had the figures to give, that is to say, concerns which had given rather more attention than most firms to their force-maintenance problems. The firms reporting are chiefly concerns which had more or less centralized employment systems and were relatively more successful in the maintenance of a stable work force. In such establishments the instability is not likely to be as serious as in the general run of American industrial concerns, which as a rule pay little or no attention to the flow of labor in and out and which give very little thought to its control.

The replacement or turnover numbers and rates in Table 7 are indicated by asterisks. This rate of replacement or turnover is, as has already been explained, the rate at which separating employees whose places must be filled are replaced by others. Thus in 1910 persons were being hired at a rate of 1.05 and employees were leaving at a rate of 1.02 per full-year worker. The aggregate standard work force was obviously undergoing expansion, and all separating employees were more or less promptly replaced. The separation rate, therefore, is to be taken as the replacement rate. In 1914 the situation was very different. Most industrial plants were curtailing operations. The result was an accession rate of .81 and a separation rate of .88. In these circumstances it is obvious that not all the separating employees were replaced — even tardily — and that consequently the accession rate is to be taken as the replacement rate. In 1914, obviously, not all of

the 326,755 separating employees contributed to the turnover as that word is here understood. There were only 300,121 persons hired during that year. This number therefore really measures the turnover, because this is the number of abandoned jobs in which there were replacements. The turnover rate, then, is the ratio between 300,121 and the 373,287 equivalent full-year workers who constituted the work force during the time within which those replacements were made. The excess of separations, amounting in 1914 to 26,634, involves a phase of labor mobility not included in turnover. This excess shows the extent to which the normal work force was diminished during 1914 and, in relation to the number of full-year workers, as already explained, it is the labor decrease rate; the corresponding excess of accessions in such a year as 1918 is the labor increase rate. In years like 1911 and 1913 the rates of accession and separation are practically equal, and it would be a matter of indifference which figure were taken to measure replacements. Reference to the actual numbers in the upper part of the table, however, shows that in 1911 the accessions were somewhat less numerous and therefore most nearly measured replacements, whereas in 1913, the separations were fewer and that in that year, therefore, they should be identified with replacements.

It is not believed that the replacement figure is likely to contain non-replacement items. The most important of such items which might be thought to lurk in the replacement figure are those cases of non-replacement brought about by a discontinuance of certain occupations, either because of the shutdown of that part of the plant which includes those occupations, or because of changes in the industrial arts. By definition the replacement rate excludes all such cases, which by the very process of discounting gross separations or accessions to get the replacement rate are automatically eliminated along with other unreplaced separations. This is believed to be true of either an expanding or a contracting business. The margin of error which may result from postponed replacements (in cases where new employees are needed but per-

haps not actually secured for a considerable period after the separation) is not believed to be wide enough seriously to vitiate this method. Moreover, this possible postponed-replacement error is almost always compensatory — replacements not actually made until the end of July for jobs which were abandoned early in June and which should have been accounted for then are, in the long run, balanced by similar delayed replacements carried over from May but actually accounted for in June.

In view of the fact that replacement rates correspond with accession rates when the accession rates are lower than the separation rates, and with separation rates when separation rates are lower than accession rates, it follows that the lowest points on Chart C must mark the rate and trend of labor replacement; that is to say, whichever line happens to be the lowest is the replacement line.

In general throughout the ten-year period the accessions and separations have naturally tended to balance each other pretty closely, although they show slight variations reflecting the changing industrial conditions from year to year. Over the whole decade it is to be noted that the accessions appreciably exceed the separations, indicating a net increase in the gainfully employed population and just about such a normal industrial expansion as would naturally be expected.

During the last few years speculation has been rife as to the probable aggregate number of labor changes over a given period in all the industrial establishments of the country. Interesting though the knowledge of these facts would be, and even if all establishments did keep labor mobility records, the task of gathering such figures would be such a stupendous one that it could scarcely be considered seriously. It is necessary, therefore, to resort to estimates based on a careful analysis of the available labor mobility figures. If, then, the 1919 mobility rates here reported are applied to the factory wage earners in the United

States in that year as shown by the United States Census of Manufactures for 1919, it would appear that the 9,096,372 wage earners on the pay rolls that year must have meant about 8,242,000 accessions and about 7,703,000 separations, or a total of about 15,945,000 job changes during that year.

NECESSARY AND UNNECESSARY LABOR CHANGES

Repeated attempts have been made in the last few years to get at the proportion of the turnover which may be considered to be avoidable. Such a separation of the necessary from the unnecessary replacement has been undertaken on the very natural assumption that the maintenance of the working force requires the hiring of only a certain number of workmen to replace those employees who have left for unavoidable reasons (death, sickness, discharge for manifest unfitness, etc.) and that whatever number of persons is found to be required over and above this so-called irreducible minimum — which has been estimated by a number of students at about 25 per cent of the work force — must be the measure of unnecessary replacement. The limits of this study do not permit a full discussion of the question as to whether or not the data on labor mobility (which phenomenon, as is shown elsewhere, is subject to constant and sometimes extreme fluctuations) can be so simplified as to express in exact figures the proportion of necessary and unnecessary labor replacement. Actually to apply this method of appraising the responsibility in labor replacement to industrial establishments as they are, presupposes wholly static industrial concerns, with unvarying amounts of employment and with work forces composed of persons who are very slightly, if at all, influenced by outside industrial forces. To be sure, there will be found industrial concerns which can offer steady employment to a certain small number of persons. In such establishments any of these employees leaving voluntarily and for no valid reason may be definitely considered as factors in the unnecessary labor replacement. But it would be extremely difficult to say when and to what extent the great

mass of employees (who are at the mercy of labor market fluctuations) may be regarded as contributing to the necessary or unnecessary labor replacement.

Bearing these limitations in mind and assuming that the strictly necessary part of the replacement amounts to 25 per cent

TABLE

NECESSARY AND UNNECESSARY

By years, from 1910 to

YEAR	NUMBER OF FULL-YEAR WORKERS[2]	LABOR CHANGES NECESSARY TO TAKE CARE OF WORK-FORCE	
		SEPARATING EMPLOYEES WHO MUST BE REPLACED	PERSONS TAKEN ON TO FILL THEIR PLACES
1910	85,263	21,316	21,316
1911	109,653	27,413	27,413
1912	188,363	47,091	47,091
1913	399,449	99,862	99,862
1913–14	244,814	61,204	61,204
1914	373,287	93,322	93,322
1915	159,054	39,764	39,764
1916	94,803	23,701	23,701
1917	58,052	14,513	14,513
1917–18	305,901	76,475	76,475
1918	56,411	14,103	14,103
1919	42,632	10,658	10,658

of the work force (an assumption whose confirmation requires much further investigation), the mobility figures of any firm or group of firms might be presented in such a way to show, separately, the necessary and unnecessary labor replacement. This has been done by applying this correction to the mobility figures shown in Table 7; the resulting figures are presented in Table 8.[1] To show how the extent of the unnecessary labor changes are calculated the following example is cited: According to the fig-

[1] Reprinted from the writers' article on "Mobility of Industrial Labor," 35 *Polit. Sci. Quar.* 584 (Dec. 1920).

ures of Table 7, and assuming as necessary for force maintenance the replacement of 25 per cent of the work force,[1] the maintenance of the aggregate work force of 305,901 employees reported in 1917–18 should have acquired only 76,475 replacements. In addition to these replacements there need to be

8

LABOR CHANGES

1919, inclusive

REPLACE 25% OF FORCE AND TO EXPANSION OR CONTRACTION		TOTAL ACTUAL LABOR CHANGES [2]	"UNNECESSARY" LABOR CHANGES		YEAR
ADDITIONAL PERSONS TAKEN ON FOR EXPANDING WORK FORCE (E) OR ADDITIONAL PERSONS SEPARATING ON ACCOUNT OF CURTAILING WORK FORCE (C) [3]	TOTAL NECESSARY LABOR CHANGES		NUMBER	PER CENT OF TOTAL ACTUAL CHANGES	
4,229 (E)	46,861	176,587	129,726	73	1910
2,886 (C)	57,712	190,944	133,232	70	1911
27,798 (E)	121,980	392,372	270,392	69	1912
6,628 (E)	206,352	1,076,864	870,512	81	1913
16,699 (C)	139,107	470,715	331,608	70	1913–14
26,634 (C)	213,278	626,876	413,598	66	1914
22,477 (E)	102,005	221,945	119,940	54	1915
30,198 (E)	77,600	232,402	154,802	67	1916
4,370 (E)	33,396	154,204	120,808	78	1917
17,706 (E)	170,656	1,244,640	1,073,984	86	1917–18
12,919 (E)	41,125	182,917	141,792	78	1918
2,651 (E)	23,967	74,851	50,884	68	1919

considered the persons required to take care of the expansion which the aggregate work force underwent during the period under consideration. The amount of this expansion is measured by the excess of accessions over separations, which is in this case 17,706. The total necessary changes were, there-

[1] And taking for granted, of course, the necessity for whatever increase or decrease changes (accessions or separations, as the case may be) naturally result from the (more or less) permanent extension or curtailment of industrial operations.

[2] Figures taken from Table 7.

[3] Arithmetic difference between accession and separation figures as shown in Table 7.

fore, 76,475 separations requiring replacement, 76,475 accessions for this replacement, and 17,706 labor-increase accessions, or a total of 170,656 necessary labor changes. Actually there were 1,244,640 labor changes. The difference is 1,073,984, which is the number of "unnecessary" labor changes. Computing the rates corresponding to the figures just given, it appears that the accession rate of 2.07 would be reduced to .33, the separation (here the replacement) rate of 2.01 to .24, and the flux rate of 4.08 to .57 if only the strictly necessary labor changes were made.

If the same rate correction be applied to the mobility figures of the period 1913–14, which, unlike 1917–18, was a time of industrial depression, the rate reductions for the earlier period would be as follows: accession (here also the replacement) rate from .93 to .24, separation rate from .99 to .30, flux rate from 1.92 to .54. The figures given in Table 8 show, on the assumption that not more than 25 per cent of the normal work force ought to have been replaced during the year to maintain that force, that most of the job shifting is unnecessary shifting and that this unnecessary shifting is enormous whether the period be one of business expansion or business depression. The percentage of unnecessary labor changes ranges from 54 per cent to 86 per cent of the labor changes which have actually taken place. The proportion of unnecessary labor changes seems to be greatest in periods of marked industrial activity, and in general it seems to fluctuate markedly in response to changes in industrial conditions.

LABOR MOBILITY IN CERTAIN LOCALITIES

Attention should be directed to the fact that at identical periods of time there may be considerable variation in the extent of labor mobility in different localities. This will depend upon the extent of industrial activity, and the opportunity for employment for particular kinds of labor in the same locality. It depends, in other words, upon the number of plants in the same locality competing for the same class of labor. It is obvious that many workmen will be attracted to any locality which is known

TABLE 9

LABOR MOBILITY IN SPECIFIED CITIES, 1913–14 AND 1917–18

(1913–14: 84 establishments; 1917–18: 176 establishments)

LOCALITY	NUMBER OF ESTABLISHMENTS	NUMBER OF FULL-YEAR WORKERS	TOTAL LABOR HOURS (THOUSANDS)	NUMBER OF LABOR CHANGES		
				ACCESSIONS	SEPARATIONS	FLUX
	1913–14					
Boston	17	35,131	105,393	20,059	19,712	39,771
Chicago	17	63,788	191,364	76,299	83,708	160,007
Cincinnati	3	1,756	5,268	2,174	2,001	4,175
Cleveland	5	4,496	13,488	3,837	3,855	7,692
Detroit	14	31,479	94,437	44,937	48,494	93,431
Milwaukee	2	1,597	4,791	780	1,228	2,008
New York	9	35,684	107,052	22,659	22,964	45,623
San Francisco	—	—	—	—	—	—
Other cities	17	70,883	212,649	56,263	61,745	118,008
Total	84	244,814	734,442	227,008	243,707	470,715
	1917–18					
Boston	—	—	—	—	—	—
Chicago	28	110,381	331,143	182,931	177,210	360,141
Cincinnati	27	18,699	56,097	30,917	29,704	60,621
Cleveland	38	43,654	130,962	110,994	108,157	219,151
Detroit	48	92,281	276,843	211,928	207,128	419,056
Milwaukee	21	26,666	79,998	56,894	56,130	113,024
New York	—	—	—	—	—	—
San Francisco	14	14,220	42,660	37,509	35,138	72,647
Other cities	—	—	—	—	—	—
Total	176	305,901	917,703	631,173	613,467	1,244,640

	RATES PER FULL-YEAR WORKER					
	ACCESSION	SEPARATION	FLUX	ACCESSION	SEPARATION	FLUX
	1913–14			1917–18		
Boston	.57	.57	1.14	—	—	—
Chicago	1.20	1.32	2.52	1.65	1.62	3.27
Cincinnati	1.23	1.14	2.37	1.65	1.59	3.24
Cleveland	.84	.87	1.71	2.55	2.49	5.04
Detroit	1.44	1.53	2.97	2.31	2.25	4.56
Milwaukee	.48	.78	1.26	2.13	2.10	4.23
New York	.63	.64	1.27	—	—	—
San Francisco	—	—	—	2.64	2.46	5.10
Other cities	.78	.87	1.65	—	—	—
Total	.93	.99	1.92	2.07	2.01	4.08

to offer good employment opportunities. Some of these workmen will, of course, prove to be neither stable nor desirable. The labor mobility in the principal cities in which investigations were made is shown in Table 9.

It is evident that Chicago and Detroit, in the 12-month period 1913–14, although it was a period of industrial depression, had mobility rates considerably higher than the average. In the light of the mobility rates for different industries, shown in Table 10, it would seem that, in the case of Detroit, this must be due to the considerable representation of automobile establishments in the figures shown. This industry underwent a remarkable growth during that period and was, relatively, less affected by the industrial depression. In the case of Chicago, it is the figures of the slaughtering and meat-packing industry which boost the mobility rates. In the period of 1917–18 the outstanding facts are the high mobility rates shown for Cleveland, Detroit, and San Francisco. In these three cities the extent of war-manufacturing activities was unusually great and the competition for labor was very keen. In both Cleveland and Detroit the highest mobility was found in the purely industrial establishments which are typical of the two cities, namely, those chiefly engaged in the manufacture of metal products, machinery, automobiles and automobile parts. In San Francisco the unusual labor shifting was most largely due to the enormous war-time expansion of shipbuilding operations on the Pacific Coast and the appeal of the war wages offered to all comers in the shipyards, not only of San Francisco Bay but also of Portland, Tacoma, Seattle, and Los Angeles.

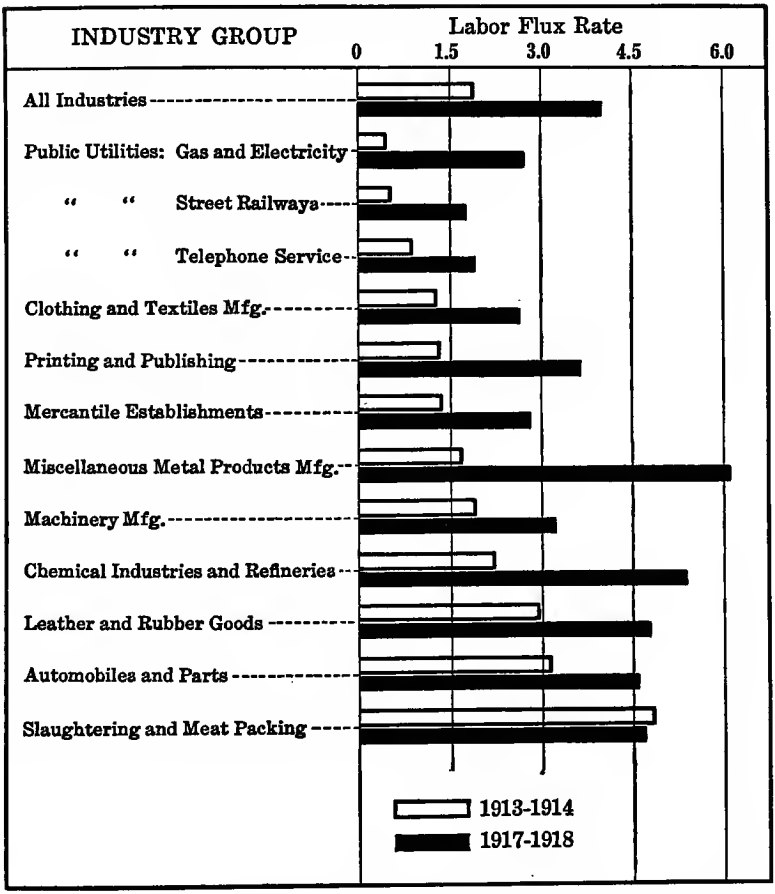
LABOR MOBILITY IN DIFFERENT INDUSTRY GROUPS

In Tables 10 *a* and 10 *b* the mobility figures for the two periods, 1913–14 and 1917–18, are classified by industry groups, and the same data are presented in graphic form in Chart D.[1]

[1] Tables and chart reprinted, after recalculation of rates, from "Mobility of labor in American industry," 10 *Mo. Labor Rev.*, 1349–1351.

Both the tabular and graphic arrays show the general increase of the mobility rates of the war years over those of the pre-war period and throw interesting side lights upon the influence of the

CHART D. COMPARISON OF LABOR FLUX RATES IN WAR AND PRE-WAR PERIODS
(Unit: One labor change per full-year worker.)



war upon certain industries. Among the industry groups here represented those which were most immediately affected by the necessity for articles of war are: automobiles and parts, chemical

industries, leather and rubber goods, machinery manufacturing, miscellaneous metal products, and slaughtering and meat packing. All of these groups, with one exception, show a decided increase

TABLE

LABOR MOBILITY IN SPECIFIED INDUSTRY

[Replacement (or "turnover") numbers

INDUSTRY GROUP	NUMBER OF ESTABLISHMENTS	NUMBER OF FULL-YEAR WORKERS	TOTAL LABOR HOURS (THOUSANDS)
1913–14			
Automobiles and parts	15	32,380	97,140
Chemical industries and refineries	3	2,900	8,700
Clothing and textile mfg.	6	24,842	74,526
Leather and rubber goods	6	14,210	42,630
Machinery mfg.	16	36,890	110,670
Mercantile establishments	5	16,543	49,629
Miscellaneous metal products mfg.	20	63,797	191,391
Printing and publishing	5	5,566	16,698
Public utilities: Gas and electricity mfg.	1	650	1,950
Street railways	3	15,540	46,620
Telephone service	2	21,801	65,403
Slaughtering and meat packing	2	9,695	29,085
Total	84	244,814	734,442
1917–18			
Automobiles and parts	30	96,856	290,568
Chemical industries and refineries	15	15,754	47,262
Clothing and textile mfg.	8	10,794	32,382
Furniture and millwork	3	2,300	6,900
Leather and rubber goods	4	5,020	15,060
Machinery mfg.	31	37,532	112,596
Mercantile establishments	7	24,124	72,372
Miscellaneous metal products mfg.	45	32,682	98,046
Printing and publishing	5	1,940	5,820
Public utilities: Gas and electricity mfg.	10	18,908	56,724
Street railways	4	9,928	29,784
Telephone service	10	21,338	64,014
Slaughtering and meat packing	4	28,725	86,175
Total	176	305,901	917,703

in the mobility rates of the war over those of the pre-war period. The rates of the slaughtering and meat-packing group show only a slight decrease. This is not surprising in view of the fact

that the mobility rate for this group in 1913–14 was already more than twice as great as the rate for all groups combined.

It might be of interest to recall here the unusual labor situation

10 *a*

GROUPS, 1913–14 AND 1917–18
are marked by asterisks (*)]

NUMBER OF LABOR CHANGES			INDUSTRY GROUP
ACCESSIONS	SEPARATIONS	FLUX	
			1913–14
50,564*	52,172	102,736	Automobiles and parts
3,447	3,024*	6,471	Chemical industries and refineries
15,715*	16,492	32,207	Clothing and textile mfg.
22,497	19,123*	41,620	Leather and rubber goods
29,465*	40,126	69,591	Machinery mfg.
11,903	10,964*	22,867	Mercantile establishments
52,313*	59,551	111,864	Miscellaneous metal products mfg.
3,851	3,679*	7,530	Printing and publishing
91*	202	293	Public utilities: Gas and electricity mfg.
4,094*	4,346	8,440	Street railways
8,465*	10,786	19,251	Telephone service
24,603	23,242*	47,845	Slaughtering and meat packing
227,008*	243,707	470,715	Total
			1917–18
222,954	220,475*	443,429	Automobiles and parts
46,880	39,622*	86,502	Chemical industries and refineries
13,687*	15,227	28,914	Clothing and textile mfg.
5,727*	7,036	12,763	Furniture and millwork
12,119*	12,393	24,512	Leather and rubber goods
62,085	59,782*	121,867	Machinery mfg.
33,165*	34,879	68,044	Mercantile establishments
104,127	99,006*	203,133	Miscellaneous metal products mfg.
3,433*	3,655	7,088	Printing and publishing
25,905*	26,661	52,566	Public utilities: Gas and electricity mfg.
8,062*	9,623	17,685	Street railways
19,740*	21,864	41,604	Telephone service
73,289	63,244*	136,533	Slaughtering and meat packing
631,173	613,467*	1,244,640	Total

created by the war period and the influence which it had upon labor mobility. War-time necessities forced far-reaching changes in the character of the product manufactured as well as in

the manufacturing processes. Plants producing war materials enormously expanded their operations. The Government itself was forced to expand its own industrial establishments to an unheard-of degree and entered into industrial fields which it had never been in before. The expansion due to war necessities required enormous numbers of work people and made necessary the very rapid training of relatively inexperienced persons who

TABLE

LABOR MOBILITY IN SPECIFIED INDUSTRY

[Replacement (or "turnover") rates

1913–14

INDUSTRY GROUP	RATE PER FULL-YEAR WORKER OF		
	ACCESSION	SEPARATION	FLUX
Automobiles and parts	1.56*	1.62	3.18
Chemical industries and refineries	1.20	1.05*	2.25
Clothing and textile mfg.	.63*	.66	1.29
Furniture and millwork	—	—	—
Leather and rubber goods	1.59	1.35*	2.94
Machinery mfg.	.81*	1.08	1.89
Mercantile establishments	.72	.66*	1.38
Miscellaneous metal products mfg.	.81*	.93	1.74
Printing and publishing	.69	.66*	1.35
Public utilities: Gas and electric mfg.	.15*	.30	.45
Street railways	.27*	.27*	.54
Telephone service	.39*	.48	.87
Slaughtering and meat packing	2.55	2.40*	4.95
Total	.93*	.99	1.92

in many instances were found to be ill adapted to factory work. There was a withdrawal of a very large number of men for military purposes. This military mobilization affected especially those industries which employed males entirely or to a large extent. Women entered into industries in larger numbers and into some industries which had not hitherto employed women. The differentiation of industries into essential and non-essential classes and the promulgation of the "work or fight" order caused large numbers of men employed in non-essential industries to leave their employment and seek jobs in plants carrying on work

essential to the prosecution of the war. Under this ruling inexperienced people, overestimating their capabilities, tried to qualify for experienced men's places and accepted jobs which they soon found out they could not fill.

On account of the unusual industrial expansion during the war period the labor supply became very limited and resulted in keen competition among individual manufacturers. After a time the

10 *b*

GROUPS, 1913–14 AND 1917–18
are marked by asterisks (*)]

1917–18

RATE PER FULL-YEAR WORKER OF			INDUSTRY GROUP
ACCESSION	SEPARATION	FLUX	
2.31	2.28*	4.59	Automobiles and parts
2.97	2.52*	5.49	Chemical industries and refineries
1.26*	1.41	2.67	Clothing and textile mfg.
2.49*	3.06	5.55	Furniture and millwork
2.40*	2.46	4.86	Leather and rubber goods
1.65	1.59*	3.24	Machinery mfg.
1.38*	1.44	2.82	Mercantile establishments
3.18	3.03*	6.21	Miscellaneous metal products mfg.
1.77*	1.89	3.66	Printing and publishing
1.38*	1.41	2.79	Public utilities: Gas and electric mfg.
.81*	.96	1.77	Street railways
.93*	1.02	1.95	Telephone service
2.55	2.19*	4.74	Slaughtering and meat packing
2.07	2.01*	4.08	Total

competition for labor became so sharp that labor recruiting methods developed which were characterized as being "destructive." The unusual industrial situation created a peculiar war psychology, causing a good deal of restlessness among work people generally. The individual workman, becoming aware of the growing scarcity of labor and of the keen competition for his labor, was naturally quick to take advantage of the favorable employment situation by constantly seeking jobs which would pay more or in which the general conditions of employment were more to his liking.

In respect to the labor situation during the war, the employment manager of a machine-tool manufacturing establishment reports that "Probably the chief cause of labor turnover at this time, particularly among machine tool industries, is the fact that a man tries to go where he can get the highest pay, coupled with the fact that manufacturers are bidding against each other for labor." And he adds that "the second and perhaps equally important cause of turnover in the machine tool trade is the fact that very recently a very large number of men have been forced either by the 'Work or Fight' law or by the necessity of earning larger money to leave the non-mechanical occupations and seek work in machine shops." These men, he says further, " are wholly unfamiliar with our work, have never been accustomed to grease, dirt, and noise, and very naturally find the work somewhat unpleasant. It is quite natural for them to think that the one shop they go to first is probably worse than any other, and if slightly encouraged in this opinion by a smooth-tongued employment man of another shop, they are likely to jump from one place to another, hoping that they will find less grease and dirt."

RELATION BETWEEN SIZE OF ESTABLISHMENT AND LABOR MOBILITY

To undertake to show some definite relationship between the size of the establishment and labor mobility, detailed figures regarding the labor changes were so arranged as to show the mobility rates of establishments with less than a thousand employees, of those having one thousand and under five thousand, and of those with five thousand employees and more. They are shown in Table 11.[1]

These figures in the main indicate a downward trend in mobility rates as the size of the establishment increases. It has not been possible to ascertain the exact reason for the relatively lower rates in the larger establishments, though it is conceivable

[1] See also Table 25, in which quitting, lay-off and discharge rates are shown for different sizes of plant.

that among the factors influencing the stability were the possibility of the larger establishments offering steadier work, relatively higher earnings, and better employment conditions generally. Lower rates might also indicate the efficiency of the

TABLE 11

RELATION BETWEEN SIZE OF ESTABLISHMENT AND LABOR STABILITY, 1913–14 AND 1917–18

NUMBER OF EMPLOYEES	NUMBER OF ESTABLISHMENTS	NUMBER OF FULL-YEAR WORKERS	TOTAL LABOR HOURS (THOUSANDS)	NUMBER OF LABOR CHANGES		
				ACCESSIONS	SEPARATIONS	FLUX
	1913–14					
Under 1,000	35	20,257	60,771	30,517	28,275	58,792
1,000 and under 5,000	36	95,690	287,070	82,611	87,562	170,173
5,000 and over	13	128,867	386,601	113,880	127,870	241,750
Total	84	244,814	734,442	227,008	243,707	470,715
	1917–18					
Under 1,000	109	51,832	155,496	137,147	132,142	269,289
1,000 and under 5,000	54	114,019	342,057	249,362	240,095	489,457
5,000 and over	13	140,050	420,150	244,664	241,230	485,894
Total	176	305,901	917,703	631,173	613,467	1,244,640
	RATE PER FULL-YEAR WORKER					
	ACCESSION	SEPARATION	FLUX	ACCESSION	SEPARATION	FLUX
	1913–14			1917–18		
Under 1,000	1.50	1.41	2.91	2.64	2.55	5.19
1,000 and under 5,000	.87	.90	1.77	2.19	2.10	4.29
5,000 and over	.87	.99	1.86	1.74	1.71	3.45
Total	.93	.99	1.92	2.07	2.01	4.08

employment department and the influence of service and welfare activities, which are generally carried on more extensively by the larger establishments.

It should also be observed that in the larger establishments there must be many inter-departmental changes which are not

included in the figures presented here. This is one reason why the flux rate is lower in the large concerns. Obviously the number of such interior labor changes is smaller, both absolutely and relatively, in the small than in the large establishments. The small single-department concern must recruit virtually all its new labor from outside accessions. The inter-departmental labor shift is in some cases quite as much a sign of labor instability as if the shift were from one employing firm to another employing firm.

In connection with the subject of the general extent of labor mobility, brief reference should be made to some particular

TABLE 12

NUMBER OF EMPLOYEES LEAVING SERVICE WITHIN 12 MONTHS OF WHEN THEY WERE HIRED, BY INDUSTRY GROUPS, YEAR ENDING MAY 31, 1918[1]

INDUSTRY GROUP	NUMBER OF ESTABLISHMENTS	PERSONS HIRED DURING YEAR		
		TOTAL NUMBER	LEFT WITHIN 1 YEAR	
			NUMBER	PER CENT OF TOTAL
Automobiles and parts, mfg.	5	12,659	8,230	65
Chemical industries and refineries	3	10,743	8,230	77
Clothing and textile manufacturing	3	6,771	4,799	71
Furniture and millwork	1	3,410	2,681	79
Machinery manufacturing	13	20,881	14,121	68
Mercantile establishments (wholesale and retail)	3	1,931	1,306	68
Miscellaneous metal products manufacturing	13	15,803	13,053	83
Printing and publishing	2	749	518	69
Public utilities:				
Gas and electricity	1	1,585	721	45
Street railways	1	3,058	1,150	38
Telephone service	8	15,616	9,949	64
Total	53	93,206	64,758	69

phases of the mobility situation having to do with the accession of employees. One of these is the relation of the newly hired employee to labor mobility. How many employees hired within

[1] Reprinted from 35 *Polit. Sci. Quar.* 594.

any particular twelve-month period are still to be found in the firm's employ at the end of that period? An answer to this question is given by the figures presented in Table 12, which shows by industry groups the proportion of the year's recruits who left before they had served a year.

This table furnished a striking illustration of the short periods for which jobs have been held by the newly hired employees during the war period and the rapidity with which they vacate them. Of the 93,206 persons hired during the year ending May 21, 1918, 64,758, or 69 per cent, left before they had served one year. The most stable recruits were those hired by the street railways, only 38 per cent of whom left before serving one year. The most unstable recruits were those hired by miscellaneous metal products manufacturing establishments, 83 per cent of whom left before they had served one year. Two other phases of the accession situation which must be touched upon are the proportion of rehirings among the total accessions, and the relation between the number of applicants and the number of available jobs, on the one hand, and to the number actually hired on the other hand. The number of accessions shown heretofore does not indicate the number of different individuals hired, since the accessions represent the total number of accessions in a given period and include original hirings as well as subsequent rehirings. Figures on the extent of rehirings were obtained by examination of the service records of employees on the pay rolls of six establishments at the end of 1915. They are shown in Table 13.

These figures show that the hiring of 44,166 individuals involved 61,225 hirings and rehirings (repeated transactions), with a resultant increase in the number of accession transactions by nearly 40 per cent. Of the 44,166 individual employees taken on, more than 76 per cent had been hired once only, 15 per cent had been hired twice, over 5 per cent had been hired three times, more than 2 per cent four times, and about one and one-half per cent had been hired and rehired more than five times. Among the employees under observation here the highest

number of hirings and rehirings was eleven, involving, however, only two employees out of more than forty-four thousand.

TABLE 13

NUMBER OF EMPLOYEES HIRED BY SAME ESTABLISHMENT SPECIFIED NUMBER OF TIMES [1]

(1915. Six establishments reporting)

NUMBER OF TIMES HIRED	EMPLOYEES HIRED SPECIFIED NUMBER OF TIMES		NUMBER OF REHIRINGS INVOLVED	TOTAL NUMBER OF HIRINGS AND REHIRINGS INVOLVED
	NUMBER	PER CENT DISTRIBUTION		
1	33,765	76.45	0	33,765
2	6,444	14.59	6,444	12,888
3	2,353	5.33	4,706	7,058
4	940	2.13	2,820	3,760
5	412	.93	1,648	2,060
6	143	.32	715	858
7	65	.15	390	455
8	25	.06	175	200
9	12	.03	96	108
10	5	.01	45	50
11	2	[a]	20	22
Total	44,166	100.00	17,059	61,225

The figures shown in Table 14 are the result of a special study of the correlation between length of time and the extent of hiring and rehiring. They demonstrate that, as the period within which employees had been hired specified number of times increases, there is a corresponding increase of the number of rehirings, but that when the maximum period of this continuous service within which employees had been hired specified number of times extends beyond the 10-year mark there is a noticeable and decided drop in the extent of rehiring.

The figures concerning the number of applicants for jobs are based upon the records of eight establishments which kept ac-

[1] Figures obtained by examination of the service records of the 44,166 employees on the pay rolls of the six establishments at the end of 1915.

[a] Less than .01 per cent.

count of the number of applicants for a longer or shorter period between 1912 and 1919 and indicate that with an aggregate number of workers amounting to 122,973 there were 1,041,475 applicants, of which number 145,509, or 14 per cent, were actually

TABLE 14

NUMBER OF EMPLOYEES ON PAY ROLL OF THREE ESTABLISHMENTS WHO HAD BEEN HIRED SPECIFIED NUMBER OF TIMES, CLASSIFIED ACCORDING TO THE LENGTH OF TIME WITHIN WHICH THE HIRINGS AND REHIRINGS TOOK PLACE,[1] 1915

(3 establishments reporting)

NUMBER OF YEARS WITHIN WHICH HIRINGS OCCURRED	NUMBER OF EMPLOYEES WHO HAD BEEN HIRED									
	2 TIMES	3 TIMES	4 TIMES	5 TIMES	6 TIMES	7 TIMES	8 TIMES	9 TIMES	10 TIMES	11 TIMES
1 . .	527	32	3							
2 . .	551	123	31	3						
3 . .	456	164	71	17	4					
4 . .	325	171	52	24	9	2				
5 . .	201	130	45	29	6	5	1			
6 . .	157	102	48	28	15	1	1	1		
7 . .	94	75	42	20	8	5		2		
8 . .	58	31	22	14	2	3	1			
9 . .	58	57	35	20	8	5	1	1	1	1
10 . .	46	32	21	10	4	6	5			
11 . .	19	19	5	1	2	2				
12 . .	13	7	2							
13 . .	5	5	1	1				1		1
14 . .	10	4	2	1						
15 . .	3	4	1	2						
Over 15	10	5	2	1						

hired. This means, in other words, that for each person hired for a job there were more than seven persons applying for that job.

The employment manager of a machinery manufacturing establishment reports that in order to obtain 500 employees, during the year ending May 31, 1918, it was necessary to hire at least 1500, only a third of whom showed up ready to go to work on

[1] Based on individual service records of the 13,281 employees on the pay rolls of the three establishments at the end of 1915.

the appointed day. He remarks that the "others apparently were floaters, who drifted from one shop to another and accepted jobs only from the highest bidders. Often when we thought that we had hired a sufficient number of men, we would find the next day that only one or two out of eight or ten showed up to go to work."

CHAPTER V

Labor Mobility in Individual Plants and in Separate Groups within the Work Force

In the figures which have been shown heretofore labor instability was traced largely to seasonal, cyclical, and other fluctuations in industrial activity. It must be pointed out, however, that the extent of labor mobility at any given time is quite different in different industrial establishments, and in different occupations and other groups within those establishments — and this somewhat irrespective of locality and general industrial conditions. Of these many factors which might influence the extent of mobility in individual establishments a few of the more important ones, in so far as they can readily be determined and classified, may briefly be set down here: (1) The particular character of the industry; whether it can offer relatively steady work or whether it is subject to highly seasonal variations in employment. (2) Character of the labor force — that is, the extent to which an establishment employs males and females, unskilled, semi-skilled, or skilled workers; or whether the working force consists largely of clerical employees or of persons engaged in non-mechanical occupations. (3) The general conditions of employment: wages, hours of work, etc.: the particular nature of the work; that is, whether or not it is generally disagreeable and involves exposure to dampness, noxious odors, great heat, dust, etc. (4) The effectiveness of all efforts of the management to overcome purely industrial influences and the more personal desires of individual workmen to change jobs. The influence upon individual establishments and upon special groups within the work force of the various factors enumerated here will be discussed and illustrated in the pages immediately following.

LABOR MOBILITY IN INDIVIDUAL ESTABLISHMENTS

The mobility rates which have been shown up to this point are group rates in which are merged the individual plant figures of a large number of establishments. They do not indicate the extent of existing variations in the mobility figures of the different establishments making up the group. The forces and conditions determining the extent to which labor changes take place in individual establishments are extremely varied and numerous, as was pointed out above, and they operate differently upon different establishments. Only very exhaustive inquiries could reveal which of many factors involved is particularly responsible for the special virulence or mildness, as the case may be, of instability in particular establishments. The rates in Table 15 register the net general effect which all the factors of influence have had on labor instability in the industrial establishments studied.

In the period 1913–14 the establishment mobility rates are bunched in the lower groups; in the period 1917–18 the rates are less concentrated but more evenly distributed, having quite a large representation even in the high rate groups. Thus the flux rate of 1.92 for the 84 establishments covered in 1913–14 is distributed among 32 per cent of the establishments having a flux rate of 1.20 and under, 26 per cent having a rate of 1.20 to 2.40, 23 per cent a rate of over 2.40 to 3.60, and 19 per cent of the establishments having a flux rate of over 3.60. In the period 1917–18 the flux rate of 176 establishments was 4.08 and there was a corresponding moving up of the establishments into the higher flux rate groups. In that period there were only 3 per cent of the establishments having a flux rate of 1.20 and under, while 16 per cent had a rate of over 1.20 to 2.40, 20 per cent a rate of over 2.40 to 3.60, and 61 per cent a rate of over 3.60. A corresponding movement upward is observable in both the accession and separation rates.

How the sum total of these factors affects the labor instability of the same establishments at different periods and under differ-

TABLE 15

NUMBER AND PER CENT DISTRIBUTION OF ESTABLISHMENTS HAVING CLASSIFIED LABOR MOBILITY RATES. (1913–14 AND 1917–18)

(Unit: One establishment)

ESTABLISHMENTS HAVING CLASSIFIED LABOR MOBILITY RATES PER FULL-YEAR WORKER							
CLASSIFIED RATE	1913–1914		1917–1918		CLASSIFIED RATE	FLUX	
	ACCESSION	SEPARATION	ACCESSION	SEPARATION		1913–1914	1917–1918
	NUMBER						
.60 and under .	34	26	6	7	1.20 and under	28	5
Over .60 to 1.20	17	26	27	26	Over 1.20 to 2.40	22	28
Over 1.20 to 1.80	14	18	37	34	Over 2.40 to 3.60	19	35
Over 1.80 to 2.40	12	7	26	30	Over 3.60 to 4.80	8	25
Over 2.40 to 3.00	3	4	25	29	Over 4.80 to 6.00	4	31
Over 3.00 to 3.60	1	—	22	21	Over 6.00 to 7.20	—	20
Over 3.60 to 4.20	—	—	11	12	Over 7.20 to 8.40	—	14
Over 4.20 to 4.80	—	1	10	7	Over 8.40 to 9.60	—	6
Over 4.80 . .	3	2	12	10	Over 9.60 . .	3	12
Total . .	84	84	176	176		84	176
Mobility rates: 84 Establishments	.93	.99	2.07	2.01		1.92	4.08
	PER CENT DISTRIBUTION						
.60 and under .	40	31	3	4	1.20 and under	32	3
Over .60 to 1.20	20	31	15	15	Over 1.20 to 2.40	26	16
Over 1.20 to 1.80	17	21	21	19	Over 2.40 to 3.60	23	20
Over 1.80 to 2.40	14	8	15	17	Over 3.60 to 4.80	10	14
Over 2.40 to 3.00	4	5	14	16	Over 4.80 to 6.00	5	18
Over 3.00 to 3.60	1	—	13	12	Over 6.00 to 7.20	—	11
Over 3.60 to 4.20	—	—	6	7	Over 7.20 to 8.40	—	8
Over 4.20 to 4.80	—	1	6	4	Over 8.40 to 9.60	—	3
Over 4.80 . .	4	2	7	6	Over 9.60 . .	4	7
Total . .	100	100	100	100		100	100

ent labor conditions may be seen by comparison of the mobility figures of 20 identical establishments for the two periods 1913–14 and 1917–18. It may be seen from the figures in Table 16 that with the exception of 3 establishments (Nos. 34, 48, and 56) all show a decided increase in the mobility rates over the pre-war period, the rates in one case (Establishment No. 37) being over four times as great in the war as in the pre-war period. For

TABLE

LABOR MOBILITY OF ESTABLISHMENTS

INDUSTRY OR NATURE OF BUSINESS	LOCATION	ESTABLISHMENT NUMBER	NUMBER OF FULL-YEAR WORKERS	
			1913–14	1917–18
Engineering specialties mfg.	Cincinnati	37 (146)	656	1,150
Agricultural implements mfg.	Chicago	21 (106)	6,592	5,759
Agricultural implements mfg.	Chicago	20 (105)	4,377	4,211
Motor car mfg.	Detroit	48 (194)	10,904	31,950
Structural steel fabricating	Chicago	26 (113)	243	402
Electrical appliances mfg.	Milwaukee	58 (257)	642	1,181
Metal wire, etc. mfg. [1]	Cleveland	41 (178–184)	1,247	1,408
Motor car mfg.	Detroit	51 (200)	4,928	9,869
Mail order house	Chicago	27 (109)	9,430	14,731
Machine tools mfg.	Cleveland	40 (172)	335	1,263
Electrical supplies mfg.	Chicago	28 (117)	544	733
Iron wheels and castings mfg.	Chicago	30 (115)	415	390
Machine tools mfg.	Cincinnati	35 (144)	476	1,194
Motor car mfg.	Detroit	50 (198)	897	2,504
Machine tools mfg.	Cleveland	42 (182)	1,111	1,649
Car works	Chicago	25 (102)	9,661	7,287
Machine tools mfg.	Cincinnati	56 (141)	624	883
Automobile parts mfg.	Detroit	54 (207)	1,004	3,379
Motor car mfg.	Detroit	47 (205)	3,110	11,125
Slaughtering and meat packing	Chicago	34 (126)	5,522	8,730
20 identical firms [2]	—	—	61,818	109,798

all of the twenty identical establishments taken together, there appears to have taken place nearly a two-fold increase in the flux rate; in 1913–14 it was 2.56, and in 1917–18 it was 4.44, per full-year worker.

It is to be noted, in the figures of Table 16, that in the earlier period the separation rate exceeded the accession rate. Most of these concerns, as was quite generally the case with American industrial establishments at that time, were more or less extensively reducing the number of their employees. In 1917–18, according to these figures, the rate of accession was appreciably

[1] Different mills of this establishment were reported separately in 1917–18, but are here combined for purposes of comparison with 1913–14.

[2] See note 1, p. 65.

16

REPORTED BOTH IN 1913–14 AND 1917–18

RATE OF LABOR CHANGE PER FULL-YEAR WORKER						INDUSTRY OR NATURE OF BUSINESS
ACCESSION		SEPARATION		FLUX		
1913–14	1917–18	1913–14	1917–18	1913–14	1917–18	
.33	1.77	.42	1.74	.75	3.51	Engineering specialties mfg.
.30	.96	.63	.81	.93	1.77	Agricultural implements mfg.
.36	.69	.63	.69	.99	1.38	Agricultural implements mfg.
.48	.48	.60	.45	1.08	.93	Motor car mfg.
.69	1.11	.87	.93	1.56	2.04	Structural steel fabricating
.57	2.58	1.05	2.49	1.62	5.07	Electrical appliances mfg.
.96	2.76	.69	2.73	1.65	5.49	Metal wire, etc. mfg.
1.02	3.51	.72	3.06	1.74	6.57	Motor car mfg.
.93	.93	.90	1.08	1.83	2.01	Mail order house
1.29	2.79	.81	2.01	2.10	4.80	Machine tools mfg.
1.26	2.88	1.29	2.67	2.55	5.55	Electrical supplies mfg.
1.47	3.09	1.47	2.19	2.94	5.28	Iron wheels and castings mfg.
1.41	1.80	1.56	1.65	2.97	3.45	Machine tools mfg.
1.53	3.06	1.56	2.73	3.09	5.79	Motor car mfg.
1.44	3.09	1.65	3.09	3.09	6.18	Machine tools mfg.
1.41	2.58	2.13	2.82	3.54	5.40	Car works
2.04	1.53	1.56	1.32	3.60	2.85	Machine tools mfg.
1.83	4.53	1.92	4.47	3.75	9.00	Automobile parts mfg.
2.79	3.69	2.76	4.11	5.55	7.80	Motor car mfg.
3.00	2.19	2.73	1.83	5.73	4.02	Slaughtering and meat pack'g
1.26	2.30	1.30	2.14	2.56	4.44	20 identical firms [1]

higher than the rate of separation. This reflects, in turn, the industrial activity of the war period. This shift, in a four-year interval, from a contracting, demobilizing industrial machine to an expanding one, is further revealed in the two columns headed "number of full-year workers." The aggregate working personnel of these twenty concerns increased in number from 61,818 in 1913–14 to 109,798 in 1917–18. The figures for the individual establishments show that only four of the twenty firms failed to share in this expansion. Of the four establishments which suffered a decline only one experienced a shrinkage of any considerable proportions.

[1] The rates for the 20 identical firms combined are unweighted arithmetic averages of the respective individual plant rates.

TABLE

LABOR MOBILITY BY SEX AND

INDUSTRY GROUP	NUMBER OF ESTABLISHMENTS	NUMBER OF FULL-YEAR WORKERS	TOTAL LABOR HOURS (THOUSANDS)
Males			
Automobiles and parts	2	2,872	8,616
Chemical industries and refineries	3	2,192	6,576
Clothing and textile mfg.	3	453	1,359
Furniture and millwork	2	1,851	5,553
Leather and rubber goods	1	1,173	3,519
Machinery mfg.	6	12,902	38,706
Mercantile establishments	2	817	2,451
Miscellaneous metal products mfg.	11	5,736	17,208
Printing and publishing	3	577	1,731
Public utilities: Gas and electricity mfg.	2	2,351	7,053
Street railways	2	6,881	20,643
Telephone service	7	7,355	22,065
Slaughtering and meat packing	1	4,353	13,059
Total	45	49,513	148,539
Females			
Automobiles and parts	2	210	630
Chemical industries and refineries	3	256	768
Clothing and textile mfg.	3	825	2,475
Furniture and millwork	2	174	522
Leather and rubber goods	1	102	1,306
Machinery mfg.	6	431	1,293
Mercantile establishments	2	310	930
Miscellaneous metal products mfg.	11	1,051	3,153
Printing and publishing	3	583	1,749
Public utilities: Gas and electricity mfg.	2	303	909
Street railways	2	671	2,013
Telephone service	7	11,054	33,162
Slaughtering and meat packing	1	866	2,598
Total	45	16,836	50,508

LABOR MOBILITY OF MALE AND FEMALE EMPLOYEES

The results of a special study of the relative labor mobility among males and females are given in Tables 17 *a* and 17 *b*, which show the labor change numbers and rates for each sex and industry group for the 45 firms reporting the necessary data for 1917–18. In the period covered by the table, female workers made up about one-fourth of the aggregate working personnel of

17 *a*

INDUSTRY GROUP, 1917–18

NUMBER OF LABOR CHANGES			INDUSTRY GROUP
ACCESSIONS	SEPARATIONS	FLUX	
			Males
4,708	5,421	10,129	Automobiles and parts
6,569	6,346	12,915	Chemical industries and refineries
928	934	1,862	Clothing and textile mfg.
4,319	5,639	9,958	Furniture and millwork
4,483	4,449	8,932	Leather and rubber goods
13,256	12,818	26,074	Machinery mfg.
1,182	1,198	2,380	Mercantile establishments
18,403	19,019	37,422	Miscellaneous metal products mfg.
556	633	1,189	Printing and publishing
1,135	1,194	2,329	Public utilities: Gas and electricity mfg.
5,772	7,222	12,994	Street railways
5,263	8,229	13,492	Telephone service
17,320	15,340	32,660	Slaughtering and meat packing
83,894	88,442	172,336	Total
			Females
370	250	620	Automobiles and parts
300	229	529	Chemical industries and refineries
1,062	1,272	2,334	Clothing and textile mfg.
733	692	1,425	Furniture and millwork
376	140	516	Leather and rubber goods
859	720	1,579	Machinery mfg.
314	255	569	Mercantile establishments
2,792	2,281	5,073	Miscellaneous metal products mfg.
440	529	969	Printing and publishing
811	228	1,039	Public utilities: Gas and electricity mfg.
487	315	802	Street railways
9,969	9,477	19,446	Telephone service
2,694	2,078	4,772	Slaughtering and meat packing
21,207	18,466	39,673	Total

the forty-five establishments. However, in two of the thirteen industry groups — clothing and textile manufacturing and telephone service — the women far outnumbered the men. It is also to be noted that, in several cases, the number of women workers reported is so small that it is scarcely prudent to attempt generalization. This is especially true where data are shown for only one or two establishments, as, for example, in the case of leather and rubber goods, furniture and millwork and automobiles and parts.

TABLE

LABOR MOBILITY BY SEX

INDUSTRY GROUP	Both		
	NUMBER OF ESTABLISHMENTS	NUMBER OF FULL-YEAR WORKERS	TOTAL LABOR HOURS (THOUSANDS)
Automobiles and parts	2	3,082	9,246
Chemical industries and refineries	3	2,448	7,344
Clothing and textile mfg.	3	1,278	3,834
Furniture and millwork	2	2,025	6,075
Leather and rubber goods	1	1,275	3,825
Machinery mfg.	6	13,333	39,999
Mercantile establishments	2	1,127	3,381
Miscellaneous metal products mfg.	11	6,787	20,361
Printing and publishing	3	1,160	3,480
Public utilities: Gas and electricity mfg.	2	2,654	7,962
Street railways	2	7,552	22,656
Telephone service	7	18,409	55,227
Slaughtering and meat packing	1	5,219	15,657
Total	45	66,349	199,047

RATE PER FULL-

	MALES			FEMALES		
	ACCESSION	SEPARATION	FLUX	ACCESSION	SEPARATION	FLUX
Automobiles and parts	1.65	1.89	3.54	1.77	1.20	2.97
Chem. industries and refineries	3.00	2.88	5.88	1.17	.90	2.07
Clothing and textile mfg.	2.04	2.07	4.11	1.29	1.53	2.82
Furniture and millwork	2.34	3.06	5.40	4.20	3.99	8.19
Leather and rubber goods	3.81	3.78	7.59	3.69	1.38	5.07
Machinery mfg.	1.02	.99	2.01	1.98	1.68	3.66
Mercantile establishments	1.44	1.47	2.91	1.02	.81	1.83
Miscel. metal products mfg.	3.21	3.33	6.54	2.67	2.16	4.83
Printing and publishing	.96	1.11	2.07	.75	.90	1.65
Public utilities:						
Gas and electricity mfg.	.48	.51	.99	2.68	.75	3.43
Street railways	.84	1.05	1.89	.72	.48	1.20
Telephone service	.72	1.11	1.83	.90	.87	1.77
Slaughtering and meat packing	3.99	3.51	7.50	3.12	2.40	5.52
Total	1.68	1.80	3.48	1.26	1.11	2.37

17 *b*

AND INDUSTRY GROUP, 1917–18

Sexes

NUMBER OF LABOR CHANGES			INDUSTRIAL GROUP
ACCESSIONS	SEPARATIONS	FLUX	
5,078	5,671	10,749	Automobiles and parts
6,869	6,575	13,444	Chemical industries and refineries
1,990	2,206	4,196	Clothing and textile mfg.
5,052	6,331	11,383	Furniture and millwork
4,859	4,589	9,448	Leather and rubber goods
14,115	13,538	27,653	Machinery mfg.
1,496	1,453	2,949	Mercantile establishments
21,195	21,300	42,495	Miscellaneous metal products mfg.
996	1,162	2,158	Printing and publishing
1,946	1,422	3,368	Public utilities: Gas and electricity mfg.
6,259	7,537	13,796	Street railways
15,232	17,706	32,938	Telephone service
20,014	17,418	37,432	Slaughtering and meat packing
105,101	106,908	212,009	Total

YEAR WORKER

BOTH SEXES			
ACCES-SION	SEPARA-TION	FLUX	
1.65	1.83	3.48	Automobiles and parts
2.82	2.70	5.52	Chemical industries and refineries
1.56	1.74	3.30	Clothing and textile mfg.
2.49	3.12	5.61	Furniture and millwork
3.81	3.60	7.41	Leather and rubber goods
1.05	1.02	2.07	Machinery mfg.
1.32	1.29	2.61	Mercantile establishments
3.12	3.15	6.27	Miscellaneous metal products mfg.
.87	.99	1.86	Printing and publishing
			Public utilities:
.72	.54	1.26	Gas and electricity mfg.
.84	.99	1.83	Street railways
.84	.96	1.80	Telephone service
3.84	3.33	7.17	Slaughtering and meat packing
1.59	1.62	3.21	Total

The figures indicate that the mobility rates for females are on the whole considerably lower than for males. It is a rather significant fact that whenever the mobility rates of the males are high the mobility rates of the females are also high. The combined rates of the 45 establishments here studied show the separation rate of the males to be slightly higher than the accession rate, while the accession rate of the females is greater than the separation rate. This is, of course, due to the influx of women into industries during that period. In general, the rates shown here reveal primarily the effect of war-time changes in industry and cannot be said to offer conclusive evidence that shifting is generally less among women. These figures must be used with certain reservations, since the comparison of the mobility between males and females is not made invariably between employees in the same occupation and doing similar work. This is especially noticeable in industry groups in which the female labor force constitutes only a small fraction of the total working force and is composed almost entirely of clerical employees.

DAY AND NIGHT FORCE

On the basis of figures secured from a machine tool manufacturing plant the relative responsibility fairly to be assessed against the day and night forces, respectively, for the turnover, can be fairly closely ascertained. In Table 18 the number of labor changes in this establishment and the corresponding rates are given for each year from 1916 to 1919, inclusive.

From these figures it may be seen that, over the 4-year period, 1916–19, the flux rate per full-year worker for the day force was 2.25, that of the night force 6.27, and that of the day and night forces combined 3.06. The mobility of the night force is nearly three times as great as that of the day force and the former is, therefore, responsible for an extent of mobility entirely out of proportion to its strength in the organization. Over the 4-year period the night force constituted about 20 per cent of the total working force, but is chargeable with nearly 45 per cent of the

total labor changes. The greater shifting among the night workers thus causes the flux rate for the establishment as a whole to be 35 per cent higher than it would be if the changes in the night force were in equal proportion with those of the day force.

TABLE 18

LABOR MOBILITY OF DAY AND NIGHT FORCES OF A MACHINE-TOOL MANUFACTURING ESTABLISHMENT (NO. 35–144), BY YEARS, 1916–19

YEAR	NUMBER OF FULL-YEAR WORKERS	TOTAL LABOR HOURS (THOUSANDS)	NUMBER OF LABOR CHANGES		
			ACCESSION	SEPARATION	FLUX
	DAY FORCE				
1916	806	2,418	1,251	955	2,206
1917	892	2,676	1,124	956	2,080
1918	950	2,850	1,087	1,283	2,370
1919	780	2,340	547	494	1,041
Total	3,428	10,284	4,009	3,688	7,697
	NIGHT FORCE				
1916	225	675	838	764	1,602
1917	220	660	816	749	1,565
1918	257	771	662	803	1,465
1919	143	429	415	244	659
Total	845	2,535	2,731	2,560	5,291
	TOTAL WORKING FORCE				
1916	1,031	3,093	2,089	1,719	3,808
1917	1,112	3,336	1,940	1,705	3,645
1918	1,207	3,621	1,749	2,086	3,835
1919	923	2,769	962	738	1,700
Total	4,273	12,819	6,740	6,248	12,988

	RATE PER FULL-YEAR WORKER								
	DAY FORCE			NIGHT FORCE			TOTAL WORKING FORCE		
	ACCESSION	SEPARATION	FLUX	ACCESSION	SEPARATION	FLUX	ACCESSION	SEPARATION	FLUX
1916	1.56	1.17	2.73	3.72	3.39	7.11	2.04	1.68	3.72
1917	1.26	1.08	2.34	3.72	3.39	7.11	1.74	1.53	3.27
1918	1.14	1.35	2.49	2.58	3.12	5.70	1.44	1.74	3.18
1919	.69	.63	1.32	2.91	1.71	4.62	1.05	.81	1.86
Total	1.17	1.08	2.25	3.24	3.03	6.27	1.59	1.47	3.06

LABOR MOBILITY OF SKILLED AND UNSKILLED EMPLOYEES

Of some interest in the study of turnover is a consideration of the relative instability of the skilled and unskilled. It is generally known that common or unskilled labor is less stable than skilled labor, but extensive figures are not available to show just how much less stable it is. On the basis of figures furnished by a number of industrial plants it is possible to compare skilled and unskilled employees both for the war period and the period immediately preceding the war. The figures are presented in Table 19.

The labor mobility rates for the two classes of labor show that in both periods unskilled labor was much more unstable than skilled labor. Moreover, this excess of instability on the part of the unskilled was much greater in the war than in the pre-war period. In the latter period the mobility rates of the unskilled were more than double the rates for the skilled. In 1917 the mobility rates of the unskilled were three times as great as those of the skilled. In the earlier period there was, among the skilled, slightly more than one labor change for each skilled member of the working force of the twenty-two plants and nearly three changes in unskilled jobs for each unskilled worker. In 1917–18 there were nearly three skilled-labor changes for each skilled worker and about nine unskilled-labor changes for each unskilled worker.[1]

In answer to a question addressed to a large number of establishments regarding the occupation or department in which the labor changes were greatest or least during the war period and the reason why, the almost unanimous opinion expressed was that the greatest shifting was taking place in departments in which the bulk of the employees were classified as common labor. The least shifting was reported to be taking place mainly "among the highly skilled employees who were earning big money and

[1] See also Tables 24 and 39, where additional figures are given on turnover among skilled and unskilled workers.

had long records of continuous service." The extremely large number of labor changes among the unskilled workers was due, it was repeatedly stated. to the fact that during the war period

TABLE 19

LABOR MOBILITY OF SKILLED AND UNSKILLED WORKERS, 1913–15 AND 1917–18

[10 establishments reporting for 1913, 5 for 1914, and 7 for 1915; 10 establishments reporting for year ending May 31, 1918]

Source: Report on "Mobility of Labor in American Industry," 10 *Mo. Labor Rev.*, 1352. Rates shifted to full-year worker basis

CLASS OF WORKERS	NUMBER OF FULL-YEAR WORKERS	TOTAL LABOR HOURS	LABOR CHANGES		
			ACCESSION	SEPARATION	FLUX
			NUMBER		
1913–15					
Skilled	24,733	74,199,000	14,848	16,484	31,332
Unskilled	15,660	46,980,000	20,042	22,251	42,293
Total	40,393	121,179,000	34,890	38,735	73,625
1917–18					
Skilled	16,169	48,507,000	21,919	24,830	46,749
Unskilled	4,408	13,224,000	19,661	19,203	38,864
Total	20,577	61,731,000	41,580	44,033	85,613
			RATE PER FULL-YEAR WORKER		
1913–15					
Skilled			.60	.66	1.26
Unskilled			1.29	1.41	2.70
Total			.87	.96	1.83
1917–18					
Skilled			1.35	1.53	2.88
Unskilled			4.47	4.35	8.82
Total			2.01	2.13	4.14

the demand for common labor was so great that at frequent intervals actual shortages of this kind of help were felt. The ensuing shortages resulted in a sharp competition for common

labor; employers outbid each other in order to obtain it, and the workers, taking advantage of the situation, shifted from plant to plant and city to city in enormous numbers. The competition for help was carried on mainly by means of extensive newspaper advertising. The advertisements were so alluring that, as one large employer put it, "day workers were looking for new positions during the evening and night workers during the day."

OCCUPATIONAL INCIDENCE OF LABOR MOBILITY

It is apparent that the mobility rates as shown for an establishment as a whole do not quite accurately reflect the conditions within the establishment, for the reason that the shifting may be largely confined to a single occupation or a group of occupations. To bring out the real significance of the mobility situation, therefore, further classification is necessary. Probably the most significant classification of mobility in individual establishments and one which best brings out the exact responsibility for the labor changes in the working force is that based upon occupations or jobs, or a classification in which the mobility figures are at least kept in relation to certain groups within the working force doing somewhat identical work and having similar working conditions. The advantage of such a classification lies in the fact that it makes it possible to particularize the analysis of existing conditions in the plant and trace the influence upon stability of the nature of the work and the general conditions of employment of each occupation or group of occupations. Table 20 shows the occupational responsibility for labor instability in one of the largest car-building establishments in the United States.[1]

This table shows how greatly the mobility rates of the different occupational groups vary from the rates as a whole. For exam-

[1] It was obviously impracticable to classify the labor changes by distinct operations — of which there were over 700 in this establishment — but the predominant and numerically most important in each department were carefully chosen and are here designated as principal occupations.

ple, the flux rate of the total working force of this establishment is 5.40 while at the same time the rate for one occupation, pattern makers, is 1.05 and for another, riveters, is 11.76. The figures of this establishment also show that, although for the establishment as a whole there has been an excess of separations over accessions, this applies only to some of the occupational groups, while others show the number of accessions to be greater than the number of separations, resulting in corresponding changes in the mobility rates. It is stated by the company that the influence of uncertainty in obtaining materials and certain demoralizing labor conditions are reflected in the high mobility rates of shearsmen, punch-press and power-press operators, bolt makers, and car-body builders. The high shifting frequency of car truck builders and car steam fitters is due to seasonal fluctuations. Assemblers, filers and welders, molders, wood-machine operators and upholsterers show high mobility rates because of the reduction in their number. The highest rates of labor change are found among the riveters and laborers. Both these groups of workers are regarded by the management as being of the floater type, which is a type very difficult to manage. The marked instability of workers in certain occupations in this establishment may be explained by the fact that, during the period for which figures are shown, shipbuilding on the Great Lakes received a great impetus and the type of worker employed in car building could readily be absorbed in shipbuilding plants. The relatively higher wages paid in the shipbuilding industry no doubt attracted many employees from this and other establishments.[1]

[1] See also Table 31, below, where are shown monthly flux rates for the same plant, over the same 12-month period, and for some of the same occupations represented in Table 20.

TABLE

LABOR MOBILITY IN A CAR-BUILDING
By Occupations, for Year

OCCUPATIONS	NUMBER OF FULL-YEAR WORKERS	TOTAL LABOR HOURS (THOUSANDS)	LABOR	
			NUMBER	
			ACCESSIONS	SEPARATIONS
Air-brake construction men	8	24	13	21
Assemblers, filers and welders	197	591	175	441
Bevelers, glaziers and silverers	23	69	35	44
Blacksmiths	117	351	135	156
Bolt makers	40	120	133	119
Bookkeepers, clerks, etc.	229	687	257	259
Cabinet makers	167	501	157	242
Car body builders	871	2,613	3,394	3,383
Car bottom builders	103	309	94	134
Car electricians	186	558	395	494
Car inspectors	25	75	11	8
Carpenters	72	216	120	108
Car platform builders	31	93	42	56
Car steam fitters	118	354	376	384
Car truck builders	155	465	356	379
Die and tool makers	158	474	228	230
Draftsmen	88	264	38	88
Engineers and firemen	59	177	160	146
Hammersmiths	110	330	127	164
Inside car finishers	261	783	190	328
Inside car trimmers	211	633	157	210
Laborers	1,140	3,420	6,166	6,186
Machinists, bench machinists, etc.	466	1,398	622	803
Mechanical engineers	26	78	23	25
Millwrights	146	438	423	401
Molders	49	147	142	173
Painters	517	1,551	890	1,076
Pattern makers	18	54	5	14
Printers	9	27	16	15
Riveters	139	417	763	877
Rolling mill helpers	90	270	55	63
Roof fitters	179	537	271	363
Shearsmen, punch-press op't's, etc.	446	1,338	1,395	1,576
Shop electricians	57	171	143	133
Shop steam and water fitters	47	141	88	77
Superintend's, gen'l foremen, etc.	71	213	76	98
Template makers	37	111	40	59
Tinners	152	456	199	214
Upholsterers	223	669	297	463
Watchmen	89	267	240	243
Wood machine operators	153	459	390	389
Total	7,287	21,861	18,837	20,642

20

PLANT (ESTABLISHMENT NO. 102)
Ending May 31, 1918

CHANGES				OCCUPATIONS
	RATE, PER FULL-YEAR WORKER			
TOTAL	ACCESSION	SEPARATION	FLUX	
34	1.62	2.64	4.26	Air-brake construction men
616	.87	2.25	3.12	Assemblers, filers and welders
79	1.53	1.92	3.45	Bevelers, glaziers and silverers
291	1.16	1.33	2.49	Blacksmiths
252	3.33	2.97	6.30	Bolt makers
516	1.11	1.14	2.25	Bookkeepers, clerks, etc.
399	.94	1.45	2.39	Cabinet makers
6,777	3.90	3.87	7.77	Car body builders
228	.91	1.30	2.21	Car bottom builders
889	2.13	2.64	4.77	Car electricians
19	.44	.32	.76	Car inspectors
228	1.67	1.50	3.17	Carpenters
98	1.36	1.80	3.16	Car platform builders
760	3.19	3.25	6.44	Car steam fitters
735	2.29	2.45	4.74	Car truck builders
458	1.44	1.46	2.90	Die and tool makers
126	.42	.99	1.41	Draftsmen
306	2.71	2.48	5.19	Engineers and firemen
291	1.14	1.50	2.64	Hammersmiths
518	.72	1.26	1.98	Inside car finishers
367	.75	.99	1.74	Inside car trimmers
12,352	5.40	5.40	10.80	Laborers
1,425	1.32	1.71	3.03	Machinists, bench machinists, etc.
48	.87	.96	1.83	Mechanical engineers
824	2.88	2.73	5.61	Millwrights
315	2.88	3.54	6.42	Molders
1,966	1.71	2.07	3.78	Painters
19	.27	.78	1.05	Pattern makers
31	1.77	1.65	3.42	Printers
1,640	5.46	6.30	11.76	Riveters
118	.60	.69	1.29	Rolling mill helpers
634	1.50	2.01	3.51	Roof fitters
2,971	3.12	3.54	6.66	Shearsmen, punch-press operators, etc.
276	2.49	2.34	4.83	Shop electricians
165	1.86	1.62	3.48	Shop steam and water fitters
174	1.08	1.38	2.46	Superintendents, general foremen, etc.
99	1.08	1.59	2.67	Template makers
413	1.29	1.41	2.70	Tinners
760	1.32	2.07	3.39	Upholsterers
483	2.70	2.73	5.43	Watchmen
779	2.55	2.55	5.10	Wood machine operators
39,479	2.58	2.82	5.40	Total

CHAPTER VI

Types of Separation and Causes of Turnover[1]

The reasons for employees leaving the service of an industrial establishment may be traced back either to purely voluntary action on their part, generally caused by dissatisfaction with the prevailing conditions of employment, or to action initiated by the employer and due either to curtailment of industrial activities or to dissatisfaction with the services of certain of his employees. Separations occurring on the employee's own initiative are referred to in these pages as voluntary separations or quits; and those resulting from the affirmative action of the employer are referred to as lay-offs or discharges, as the circumstances indicate. In attempting to get some conception of the relative responsibility of the various influences bearing upon the mobility of labor it is highly important to give some special consideration to each of these three types of separations. In the figures presented here on the nature of separations, "quits" are taken to include all voluntary separations, including withdrawals due to death, marriage, etc.

Discharges nearly always mean dismissal "for cause," which presupposes some form of incapacity for the work or at least what is believed to be some defect in the character of the employee. Under lay-offs are grouped those who are "let out" either temporarily or permanently whether because of the completion of the job or because of shortage of the particular work at which the laid-off employee was engaged. Lay-offs are not voluntary separations and have nothing to do with the character of the employee. Lay-offs, moreover, seldom are made for a

[1] This chapter reproduced by permission, and with some modification, from the authors' article on "The Causes of Labor Turnover," 2 *Administration*, 649–667 (November, 1921).

definite length of time, and a large proportion of laid-off employees, as a matter of fact, never return to the same establishment from which they were laid off.

In Table 21 are given the number, rate per full-year worker, and the percentage distribution of all separations, of employees discharged, laid off, and leaving voluntarily. Figures are shown for each year from 1910 to 1915 inclusive and for the 12-month period ending May 31, 1918.

The arresting fact shown in the following rate and percentage distribution figures is that the great bulk of all separations to-day, as in 1910, is due to voluntary leaving. It also appears from these figures that periods of industrial prosperity are reflected in relatively low, and periods of depression in relatively high, proportions of lay-offs to total separations, and that the lay-off rate is the most sensitive of the three separation rates to changing industrial conditions. Thus, in 1914, when the ratio of quits to total separations was lower than at any other time during the period covered by the figures, the proportion of lay-offs was higher than at any other time, constituting nearly one third (31 per cent) of all separations, while in the immediately preceding year 1913 lay-offs made up only 7 per cent of all separations. The rate figures indicate that it is not alone the proportion but also the actual rate of lay-off which is thus affected by business activity and depression, the lay-off rate for 1913 being .10, a relatively low figure, and for 1914, .25, per full-year worker, which is an exceedingly high rate for lay-offs.

The discharge rate is evidently subject to less extreme fluctuations than the lay-off rate, and it makes up from year to year a more constant proportion of the total separations. There appears, moreover, to be a rather definite relation between the accession and discharge rates, due, possibly, to the process of selection which goes on when new workers are taken on in large numbers. The consequence of the stimulating effect of business prosperity in boosting the voluntary leaving rates may be seen in the high rates of total separation, in spite of the fact that the

lay-off rates are relatively low. In periods of depression both the rates and the proportions of lay-off and discharge are higher than in periods of prosperity. This is due to the fact that when

TABLE

TYPE OF SEPARATION (DISCHARGE, LAY-OFF OR VOLUNTARY QUITTING) AND FOR THE 12-MONTH PERIOD

(Source: Report on "Mobility of Labor in American Industry."

YEAR	NUMBER OF ESTABLISHMENTS	NUMBER OF FULL-YEAR WORKERS	TOTAL LABOR HOURS
1910	7	23,273	69,819,000
1911	13	56,577	169,731,000
1912	20	72,526	217,578,000
1913	35	134,823	404,469,000
1914	50	118,195	354,585,000
1915	28	78,984	236,952,000
1917–18	108	207,303	621,909,000
Total	261	691,681	2,075,043,000

	PERCENTAGE OF TOTAL SEPARATIONS DUE TO—		
	DISCHARGE	LAY-OFF	VOLUNTARY SEPARATION
1910	15	3	82
1911	19	10	71
1912	20	6	74
1913	17	7	76
1914	20	31	49
1915	16	20	63
1917–18	14	8	79
Total	16	11	73

depression sets in there are unusually large numbers laid off and employees are discharged more freely than would be the case when labor is urgently needed.

The influence of the prevailing industrial conditions not only upon the separation rate as a whole but more specifically upon the three types of separation — quitting, lay-off, and discharge,

which make up this rate — is shown in Table 2, on page 16, which gives the trend, from 1912 to 1919, of accession (hiring) and classified separation rates in a middle western metal products

21

OF EMPLOYEES LEAVING, BY YEARS FROM 1910 TO 1915, INCLUSIVE, ENDING MAY 31, 1918

10 *Mo. Labor Rev.*, 1354. Rates shifted to full-year worker basis)

ACCESSIONS	SEPARATIONS				
	DISCHARGES	LAY-OFFS	VOLUNTARY SEPARATIONS	TOTAL	
15,936	2,608	514	14,230	17,352	1910
53,506	9,837	5,082	35,716	50,635	1911
78,843	13,628	4,057	49,806	67,491	1912
182,276	32,094	13,334	141,035	186,463	1913
82,585	19,565	29,737	46,660	95,962	1914
50,421	6,946	8,536	26,862	42,344	1915
393,164	51,400	29,833	299,157	380,390	1917–18
856,731	136,078	91,093	613,466	840,637	Total

	RATE, PER FULL-YEAR WORKER, OF				
ACCESSION	SEPARATION				
	DISCHARGE	LAY-OFF	VOLUNTARY SEPARATION	TOTAL	
.68	.11	.02	.61	.74	1910
.95	.17	.09	.63	.89	1911
1.09	.19	.06	.69	.94	1912
1.35	.24	.10	1.05	1.39	1913
.70	.17	.25	.40	.82	1914
.64	.09	.11	.34	.54	1915
1.90	.25	.14	1.44	1.83	1917–18
1.24	.20	.13	.89	1.22	Total

manufacturing plant. This trend, in so far as the separation rates are concerned, is shown graphically in Chart E, on page 83.[1]

Perhaps the most striking fact brought out by this chart is the very close way in which the quitting rate parallels the total

[1] Chart reprinted by permission from the authors' article on "Causes of Labor Turnover," *Administration*, November, 1921.

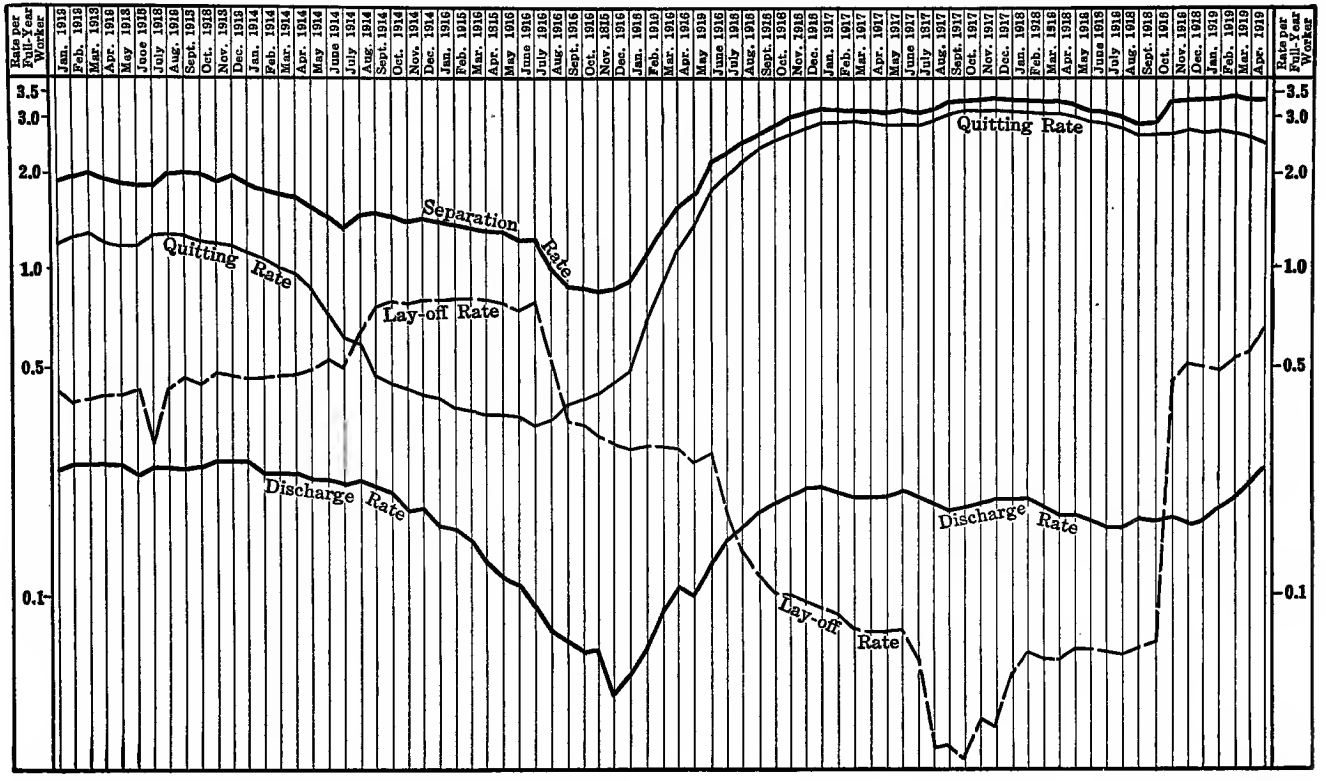
separation rate, the margin being relatively wide in periods of depression and relatively narrow in periods of great industrial activity. At the points where the separation rate generally declines, the lay-off rate shows, at first, a decided upward trend, but the discharge rate declines even more rapidly than the separation rate as a whole. In the period of increasing industrial activity, especially during the war period, the discharge rate runs along at about the same relatively low level, while the lay-off rate steadily declines, reaching its lowest point at a period which marks the peak of activity in this plant.

The form of the lay-off rate curve in the early part of the seven-year period shows that it was the great increase in the number laid off in the latter part of 1914 that raised the separation rate during that time so considerably above the accession rate. This shows how inaccurate the separation curve would be if taken to measure "turnover" — unless that term is to be used in reference to something entirely different from the amount of change involved in maintenance, that is to say — replacement. Almost the whole margin, in this part of the period, between the separation and accession rates is due to increased lay-offs, i.e., to a (more or less) permanent decrease in the size of the standard working force.[1] Remarkable reductions took place during the first three and a half years, in both the quitting and discharge rates. When the war began in Europe this establishment had, apparently, gone a long way toward the elimination of discharges as a factor in turnover. In the three years from 1912 to 1915, it reduced its rate of discharge from .25 to .05 per full-year worker, or 80 per cent. But during the war period from December 31, 1915, to April 30, 1919, the discharge rate increased 400 per cent. The most important pre-war reduction is, of course, in the quitting rate, because the quitters are responsible for the bulk of the turnover. This company's quitting rate went down from 1.23 in January, 1912, to .36 in June, 1915, — a decline of 71 per cent. But the quitting rate increased 271 per cent between the year

[1] Compare Chart A above, p. 19.

CHART E. TREND OF CLASSIFIED SEPARATION RATES IN A METAL-PRODUCTS MANUFACTURING PLANT, FROM JANUARY, 1912, TO APRIL, 1919

(Unit: One separation per full-year worker: Logarithmic scale of ordinates.)



ended December 31, 1915, and the year ended April 30, 1919. It is quite evident, as has been pointed out, that it is the quitting rate which primarily determines the total separation rate.

The disturbing effect of war conditions is very evident. Both accession and separation rates had risen in 1918 to points far above the high points of the 1912–1915 period. An examination of the accession rate and the different separation rates (shown in Table 2) indicates that the war pushed all rates except the lay-off rate well above the remarkably low points reached in 1915. Worse yet, the charts show that it pushed all except the lay-off and discharge rates up to a point even higher than the maximum rates of 1912, so that total separation and accession rates and the replacement rate,[1] which in this case is identical with the separation rate, rose to points never before reached within the period covered by the figures reported. It is interesting to note the effect of the war on the lay-off rate. During the period 1912–1915 it was reduced 28 per cent. War conditions apparently greatly accelerated this reduction and showed a lay-off rate of .08 per full-year worker for the year ended May 31, 1918, as compared with .31 for the year 1915, — a reduction of 77 per cent. But in the latter part of 1918, the lay-off rate began to rise and the rate for the year ending April 30, 1919, stood at .67, the highest it had been since 1915. Despite the increased war demand for labor, the discharge rate increased from .05 in 1915 to .17 in 1918, — an increase of 240 per cent. It has continued to rise, and stood at .25 for the year ended April 30, 1919.

The proportions of the total separations in industrial establishments due to discharge, lay-off, and (voluntary) quitting in the period 1913–14, and to discharge, lay-off, entry into military service, and quitting in 1917–18, are shown in Table 22.

It is evident that the war period brought about a considerable decrease in the proportion of discharges and in the number of establishments having a heavy proportion of separations due to discharges. The war period had the same effect upon lay-offs,

[1] Shown on Chart A, page 19.

but, on the contrary, it brought about a great increase in the number of establishments having a heavy proportion of separations due to voluntary leaving. The figures of Table 22 for sixty-six establishments reporting in 1913–14 and one hundred

TABLE 22

NUMBER OF ESTABLISHMENTS IN WHICH CLASSIFIED PROPORTIONS OF THE TOTAL SEPARATIONS ARE ATTRIBUTABLE, RESPECTIVELY, TO DISCHARGE, LAY-OFF, ENTRY INTO MILITARY SERVICE, AND VOLUNTARY QUITTING, 1913–14 AND 1917–18

PERCENTAGES OF TOTAL SEPARATIONS	NUMBER OF ESTABLISHMENTS HAVING CLASSIFIED PERCENTAGES OF THE TOTAL SEPARATIONS DUE TO EMPLOYEES HAVING —			PERCENTAGE OF TOTAL SEPARATIONS	NUMBER OF ESTABLISHMENTS HAVING CLASSIFIED PERCENTAGES OF THE TOTAL SEPARATIONS DUE TO EMPLOYEES HAVING QUIT
	BEEN DISCHARGED	BEEN LAID OFF	ENTERED MILITARY SERVICE		
1913–14					
5 or less	6	8	—	40 or less	13
Over 5 to 10	7	10	—	Over 40 to 50	11
Over 10 to 15	13	6	—	Over 50 to 60	12
Over 15 to 20	6	4	—	Over 60 to 70	7
Over 20 to 25	6	2	—	Over 70 to 80	11
Over 25 to 30	9	—	—	Over 80 to 90	9
Over 30	19	18	—	Over 90 to 100	3
Total	66	48	—	Total	66
1917–18					
5 or less	24	34	43	40 or less	3
Over 5 to 10	39	15	49	Over 40 to 50	4
Over 10 to 15	22	6	5	Over 50 to 60	6
Over 15 to 20	13	1	7	Over 60 to 70	18
Over 20 to 25	5	2	1	Over 70 to 80	31
Over 25 to 30	3	5	—	Over 80 to 90	37
Over 30	1	5	—	Over 90 to 100	9
Total	107	68	105	Total	108

and seven reporting in 1917–18 indicate that discharges in 1918 made up over 30 per cent of all separations in less than 1 per cent of the establishments reporting, whereas in 1913–14 they bulked that large in nearly one-third of the establishments reporting.

TABLE

NUMBER AND RATE PER FULL-YEAR WORKER OF EMPLOYEES DISCHARGED, BY INDUSTRY GROUPS,

INDUSTRY GROUP	NUMBER OF ESTABLISHMENTS	NUMBER OF FULL-YEAR WORKERS	TOTAL LABOR HOURS (THOUSANDS)
1913–14			
Automobiles and parts	14	31,420	94,260
Chemical industries and refineries	3	2,900	8,700
Clothing and textile mfg.	3	2,588	7,764
Furniture and millwork	—	—	—
Leather and rubber goods	4	9,018	27,054
Machinery mfg.	10	23,039	69,117
Mercantile establishments	4	7,113	21,339
Miscellaneous metal products mfg.	17	46,495	139,485
Printing and publishing	5	5,566	16,698
Public utilities:			
Gas and electricity mfg.	1	650	1,950
Street railways	3	15,540	46,620
Telephone service	3	21,801	65,403
Slaughtering and meat packing	—	—	—
Total	66	166,130	498,390
1917–18			
Automobiles and parts	16	68,799	206,397
Chemical industries and refineries	7	7,549	226,647
Clothing and textile mfg.	4	2,098	6,294
Furniture and millwork	1	275	825
Leather and rubber goods	2	4,443	13,329
Machinery mfg.	21	29,185	87,555
Mercantile establishments	5	7,362	22,086
Miscellaneous metal products mfg.	27	15,453	46,359
Printing and publishing	3	1,628	4,884
Public utilities:			
Gas and electricity mfg.	5	11,566	34,698
Street railways	3	8,882	26,646
Telephone service	10	21,338	64,014
Slaughtering and meat packing	4	28,725	86,175
Total	108	207,303	621,909

As to the lay-offs, the same figures demonstrate that in 1917–18 they constituted over 30 per cent of all separations in less than 8 per cent of the concerns reporting, but in 1913–14 they made up over 30 per cent of all separations in 37 per cent of the establish-

23 *a*

LAID OFF, ENTERING MILITARY SERVICE, AND LEAVING VOLUNTARILY, 1913–14 AND 1917–18

NUMBER OF EMPLOYEES LEAVING WHO —					INDUSTRY GROUP
WERE DISCHARGED	WERE LAID OFF	ENTERED MILITARY SERVICE	LEFT VOLUNTARILY	TOTAL	
					1913–14
11,835	17,366	——	21,580	50,781	Automobiles and parts
515	362	——	2,147	3,024	Chem. industries and refin's
447	58	——	1,434	1,939	Clothing and textile mfg.
——	——	——	——	——	Furniture and millwork
2,066	922	——	9,117	12,105	Leather and rubber foods
2,664	5,106	——	8,169	15,939	Machinery mfg.
243	772	——	1,322	2,337	Mercantile establishments
7,979	5,368	——	37,422	50,769	Miscel. metal products mfg.
857	515	——	2,307	3,679	Printing and publishing
					Public utilities:
42	27	——	133	202	Gas and electricity mfg.
2,549	——	——	1,797	4,346	Street railways
1,713	3,924	——	5,149	10,786	Telephone service
——	——	——	——	——	Slaughter'g and meat pack'g
30,910	34,420	——	90,577	155,907	Total
					1917–18
14,623	10,420	10,599	93,001	128,643	Automobiles and parts
2,430	756	1,175	20,848	25,209	Chem. industries and refin's
264	22	61	2,633	2,980	Clothing and textile mfg.
26	——	30	649	705	Furniture and millwork
902	52	440	9,813	11,207	Leather and rubber goods
3,786	1,658	2,959	33,628	42,031	Machinery mfg.
837	3,972	522	10,432	15,763	Mercantile establishments
3,932	896	2,027	32,669	39,515	Miscel. metal products mfg.
90	1	158	2,909	3,158	Printing and publishing
					Public utilities:
1,162	5,624	1,680	9,221	17,687	Gas and electricity mfg.
1,697	55	951	5,681	8,384	Street railways
3,354	2,362	1,353	14,795	21,864	Telephone service
18,306	4,015	1,645	39,278	63,244	Slaughtering and m't pack'g
51,400	29,833	23,600	275,557	830,390	Total

ments. Voluntary quits in 1918 made up over 80 per cent of all separations in nearly half of the establishments reporting, while in 1913–14 they constituted this large a proportion in less than one-fifth of the concerns reporting.

TABLE

NUMBER AND RATE PER FULL-YEAR WORKER OF EMPLOYEES DISCHARGED, BY INDUSTRY GROUPS,

INDUSTRY GROUP	RATE, PER FULL-				
	DISCHARGE	LAY-OFF	ENTRY INTO MILITARY SERVICE	LEAVING VOLUNTARILY	TOTAL SEPARATION
	1913-14				
Automobiles and parts	.38	.55	——	.69	1.62
Chemical industries and refineries	.18	.12	——	.74	1.04
Clothing and textile mfg.	.17	.02	——	.56	.75
Furniture and millwork	——	——	——	——	——
Leather and rubber goods	.23	.10	——	1.01	1.34
Machinery mfg.	.12	.22	——	.35	.69
Mercantile establishments	.03	.11	——	.19	.33
Miscellaneous metal products mfg.	.17	.11	——	.80	1.08
Printing and publishing	.15	.09	——	.41	.65
Public utilities: Gas and e'ctric'y mfg.	.07	.04	——	.20	.31
Street railways	.17	——	——	.12	.29
Telephone service	.08	.18	——	.24	.50
Slaughtering and meat packing	——	——	——	——	——
Average	.19	.21	——	.55	.95

How the relative proportions of discharges and voluntary separations have changed during the last few years may be seen from the figures for a large machine tool manufacturing establishment. The percentage of employees leaving voluntarily, as against the total number of separations, for each of the three years ended June 30, 1916, 1917, and 1918, and for the three-months period, July to September, 1918, inclusive, for the day force, were 80, 81, 86, and 92, respectively. The percentages of voluntary separations for the night force, for the same periods, were 77, 82, 91, and 96 per cent, respectively. The ratios of discharged employees for the day force for the years ending June 30, 1916, 1917, and 1918, and the three-months period, July to September, 1918, inclusive, were 20, 19, 14, and 8 per cent, respectively. During the same periods the night force showed the following percentages of discharges: 23, 18, 9, and 5 re-

23 *b*

LAID OFF, ENTERING MILITARY SERVICE, AND LEAVING VOLUNTARILY, 1913–14 AND 1917–18

YEAR WORKER, OF DISCHARGE	LAY-OFF	ENTRY INTO MILITARY SERVICE	LEAVING VOLUNTARILY	TOTAL SEPARATION	INDUSTRY GROUP
1917–18					
.21	.15	.15	1.35	1.86	Automobiles and parts
.32	.10	.16	2.76	3.34	Chemical industries and refineries
.13	.01	.03	1.25	1.42	Clothing and textile mfg.
.10	——	.11	2.36	2.57	Furniture and millwork
.20	.01	.10	2.21	2.52	Leather and rubber goods
.13	.06	.10	1.15	1.44	Machinery mfg.
.11	.54	.07	1.42	2.14	Mercantile establishments
.26	.06	.13	2.12	2.57	Miscellaneous metal products mfg.
.05	*a*	.10	1.79	1.94	Printing and publishing
.16	.11	.06	.69	1.02	Public utilities: Gas and el'ctric'y mfg.
.10	.49	.14	.80	1.53	Street railways
.19	.01	.11	.64	.95	Telephone service
.64	.14	.06	1.37	2.21	Slaughtering and meat packing
.25	.14	.11	1.33	1.83	Average

spectively. Quitting became more frequent; firing much less frequent.

In Tables 23 *a* and 23 *b*, the subdivided separation rates are classified according to the various industry groups covered in the two investigations.

These figures bring out some rather important and significant facts with regard to various industries. It is evident, for example, that mercantile establishments had the minimum discharge rate in 1914 and printing and publishing plants in 1918; the minimum lay-off rate in 1914 was in clothing and textiles and in 1918 in printing and publishing; and the minimum quitting rate in 1914 was in the street railway industry and in 1918 in the telephone service. The maximum discharge rate was in the automobile industry in 1914 and in the slaughtering and meat-packing

a Less than .005.

industry in 1918. The maximum lay-off rate in 1914 was in the automobile industry and in 1918 in mercantile establishments, and the maximum quitting rate was in leather and rubber goods in 1914 and in chemical industries in 1918. The figures show, furthermore, that in 1914 in the automobile group discharges and lay-offs made up over half of all separations, but that by 1918 they had been reduced to less than one-fourth of all separations. In the miscellaneous metal products industries, discharges and lay-offs constituted in 1914 nearly one-third of all separations, but by 1918 they had been cut down to about one-eighth of the total separations. In mercantile establishments, on the other hand, discharges and lay-offs bulk about as heavily among the separations in the earlier as in the later period, making up nearly half of all separations both then and now.

An attempt to establish some relation between the particular type of separation and the relative skill of the separating employee is made in Table 24, in which are classified the returns from 22 establishments which reported mobility figures for skilled and unskilled employees separately.[1]

The degree of occupational training and skill possessed by the employees appears to make little or no difference in the proportion of quits, discharges, and lay-offs in the total number of separations. The percentage distribution figures show that 76 per cent of the skilled employees and 72 per cent of the unskilled employees who left, did so voluntarily; 15 per cent of the skilled and 19 per cent of the unskilled were discharged, and 10 per cent of the skilled and 9 per cent of the unskilled employees leaving were laid off. The situation is quite different, however, with regard to the actual rate of separation, the figures indicating conclusively that the lay-off, discharge, and quitting rates, and, of course, the total separation rate, are each much higher for unskilled than for skilled workers, the total separation rate being

[1] Compare also Tables 19 and 39.

.66 for skilled and 1.41 for unskilled workers. The subdivided separation rates show about the same relation between skilled and unskilled, so that it would appear that skilled workers are about twice as stable as semiskilled and unskilled ones.

TABLE 24

COMPARISON OF SEPARATION RATES OF SKILLED AND UNSKILLED EMPLOYEES LEAVING VOLUNTARILY, DISCHARGED, AND LAID OFF DURING ONE YEAR

(1913, 1914, and 1915; 22 establishments reporting)

	SEPARATIONS DURING YEAR					
	NUMBER		RATE PER FULL-YEAR WORKER[1]		PERCENTAGE DISTRIBUTION	
	SKILLED	UNSKILLED	SKILLED	UNSKILLED	SKILLED	UNSKILLED
All Separations:	16,484	22,251	.66	1.41	100	100
Quits	12,451	16,093	.51	1.03	76	72
Discharges	2,432	4,171	.09	.27	15	19
Lay-offs	1,601	1,987	.06	.12	10	9

In Table 25 the relation between type of separation and size of establishment is shown on the basis of the mobility figures of the sixty-six establishments reporting in 1913–14 and one hundred and eight establishments reporting in 1917–18.

In the period 1913–14 there is observable quite a marked decrease in the discharge and lay-off rates as the size of the establishment increases. The explanation for this may be sought in the fact that the large-size establishments were less seriously affected by the industrial depression which made itself felt during the latter part of that period. The situation is reversed, however, in the period 1917–18, the discharge and lay-off rates being slightly higher in the larger establishments. In both periods the separation rates as a whole show a slight decrease as the size of the establishment increases.

[1] Based on 74,199,000 skilled-labor hours and 46,980,000 unskilled-labor hours put in during year in the 22 establishments.

TABLE

RELATION BETWEEN SIZE OF ESTABLISHMENT AND TYPE OF SEPARATION VOLUNTARY QUITTING),

NUMBER OF EMPLOYEES	NUMBER OF ESTABLISHMENTS	NUMBER OF FULL-YEAR WORKERS	TOTAL LABOR HOURS (THOUSANDS)
1913–14			
Under 1000	29	16,097	48,291
1000 and under 5000	29	72,634	217,902
5000 and over	8	77,399	232,197
Total	66	166,130	498,390
1917–18			
Under 1000	67	32,453	97,359
1000 and under 5000	32	69,182	207,546
5000 and over	9	105,668	317,004
Total	108	207,303	621,909
1913–14			
Under 1000			
1000 and under 5000			
5000 and over			
Total			
1917–18			
Under 1000			
1000 and under 5000			
5000 and over			
Total			

CAUSES OF SEPARATION

The need for definite and detailed information on the causes of labor instability is obvious. In order to devise methods of stabilizing the work force and eliminating unnecessary labor changes, it is quite necessary to know the factors responsible for

25

(DISCHARGE, LAY-OFF, ENTRY INTO MILITARY SERVICE, AND 1913–14 AND 1917–18

NUMBER OF EMPLOYEES WHO—					NUMBER OF EMPLOYEES
WERE DISCHARGED	WERE LAID OFF	ENTERED MILITARY SERVICE	LEFT VOLUNTARILY	TOTAL	
					1913–14
5,929	5,512	——	12,014	23,455	Under 1000
15,335	18,880	——	31,698	65,913	1000 and under 5000
9,646	10,028	——	46,865	66,539	5000 and over
30,910	34,420	——	90,577	155,907	Total
					1917–18
7,107	3,868	4,110	56,414	71,499	Under 1000
12,952	10,201	8,125	97,097	128,375	1000 and under 5000
31,341	15,764	11,365	122,046	180,516	5000 and over
51,400	29,833	23,600	275,557	380,390	Total
RATE, PER FULL-YEAR WORKER, OF					
DISCHARGE	LAY-OFF	ENTRY INTO MILITARY SERVICE	LEAVING VOLUNTARILY	TOTAL SEPARATION	
					1913–14
.37	.34	——	.75	1.46	Under 1000
.21	.26	——	.44	.91	1000 and under 5000
.13	.13	——	.61	.87	5000 and over
.19	.21	——	.55	.95	Total
					1917–18
.22	.12	.13	1.74	2.21	Under 1000
.19	.15	.12	1.40	1.86	1000 and under 5000
.30	.15	.11	1.16	1.72	5000 and over
.25	.14	.11	1.33	1.83	Total

the labor shiftings. It is hardly necessary to call attention in this place to the fact that the causes of labor instability present a very vast and complex problem. It is obvious that a determination of these causes, because of their complex nature and the large number of factors to be considered, would necessitate an

inquiry of a magnitude quite beyond the scope of the present inquiry. In discussing the underlying reasons for separations we are disregarding here the separations from service due to purely industrial conditions and fluctuations in production, that is to say, forced separations, or lay-offs, the occurrence of which depends upon whether or not a particular job has been finished or whether or not industrial depression has set in. No attempt is made here to discuss that part of the labor shifting which is due to maladjustment of labor supply and demand caused by an unorganized labor market, by a defective system of labor distribution, or by maladjustment in the matter of wage levels for similar work in different localities, etc.

In view, therefore, of the complexity of the problem and the lack of information on the subject, it is proposed to discuss here, not the causes of mobility that are primarily inherent in the industrial community situation, but the more personal causes of labor shifting as those causes find expression in the separating employee and as they have been classified by individual employers. It is recognized, of course, that the non-industrial and personal causes are inextricably interwoven with the conditions created by the prevailing industrial situation.

In their efforts to stabilize the labor force a number of firms have made attempts to discover the causes of instability and more particularly to find out the immediate, or precipitating, causes for separations from service. They have done this on the assumption that if it were feasible to ascertain the fundamental reasons why men leave their employ, it would be possible, through the tabulation and analysis of those reasons, to show the real causes of instability. It was felt, moreover, that if it were practicable to ascertain the real reasons for employees leaving, it might be then relatively easy to develop a record which would be of considerable value in the solution of the employment problem in the individual establishments concerned, and so point the way toward greater stability.

Even in this individual method of ascertaining the causes for

labor instability there are serious difficulties to be overcome. Employment managers and others in charge of the work force essay to interview an employee who is about to leave of his own accord. This interview is held, of course, before the employee actually severs his connection with the firm. At the interview the employer or his agent tries to secure a frank and truthful statement from the employee regarding the actual reasons which are impelling him to leave. Employers point out, however, the difficulties involved in interviewing prospective quitters. They say that it is difficult to do this, even in normal times, and that it was especially difficult during the war period because of the more independent attitude assumed by the workers. It is generally found that men leaving service do not like to be questioned too closely regarding their reasons for leaving, and often plainly resent such inquiries. It is claimed that in many cases they give some fictitious excuse rather than a substantial reason, and when pressed advance the most plausible reason they can get away with.

From the standpoint of the worker it is perhaps not difficult to understand his reluctance to give full information regarding his reasons for leaving. Such knowledge in the possession of the employer might be disadvantageous to the employee in his search for a new job, and it might in other ways have the effect of restricting his freedom of movement. The employee will have observed that nearly all employment departments keep careful records of employees' past records and that employers generally keep each other informed about the movements of former employees.

To the difficulties of learning from employees the reasons for leaving, there must be added the difficulty of analyzing and classifying the results obtained. It has been the experience of men interviewing prospective quitters that even where the reason for quitting has been obtained, it has not always been easy to reduce to a single classifiable category the manifold motives which may have animated the individual in his desire to change

jobs. Many employment managers believe that only in the case of discharges can the causes of separation really definitely be known. This is obviously because action in the case of discharge proceeds from the management and the employee has nothing to say about it.

For the reasons given in the preceding paragraph, the figures on causes for quitting which are presented below cannot be regarded as more than an indication of existing conditions, although employers who have kept such figures have expressed the opinion that in most cases they point definitely toward certain existing maladjustments and to particular causes that need to be attacked. In Table 26 are given the classified assigned reasons for the voluntary separation and the causes for the discharge of nearly 10,000 employees in six metal trades establishments.

TABLE 26

REASONS ADVANCED FOR VOLUNTARY SEPARATION FROM SERVICES OF 8140 EMPLOYEES AND CAUSES FOR DISCHARGE OF 1439 EMPLOYEES, IN SIX METAL TRADES ESTABLISHMENTS

Reason for Voluntary Separation	Cases		Cause of Discharge	Cases	
	Number	Per Cent		Number	Per Cent
Wages — Dissatisfied with wage rate, etc.	2,001	24.6	Incompetent	478	33.2
Obtained better job or returned to former job	984	12.1	Unreliable	422	29.3
Nature of work — too hard, heavy, wet, dusty, dirty	410	5.0	Lazy	148	10.3
Dissatisfied	674	8.3	Careless	66	4.6
Monotony	218	2.7	Insubordination	93	6.5
Physical inability — sickness, injuries, etc.	461	5.7	Misconduct	54	3.7
Leaving town	453	5.6	Trouble breeder	105	7.3
Return to school	131	1.6	Liquor	73	5.1
All other known reasons	58	.7			
Military service	737	9.0			
Unknown — failed to report	2,013	24.7			
Total	8,140	100.0	Total	1,439	100.0

The classification of causes presented in this table is anything but satisfactory. A more detailed and scientific arrangement was impossible, however, because of the necessity for making a combination of the records of the several establishments, each of which put a somewhat different interpretation upon their recorded reasons for leaving or causes for discharge. Nevertheless, some of the reasons listed can be somewhat more fully explained. Dissatisfaction with wages is evidently the largest single reason for voluntary separation, and no doubt it is safe to assume that the wage motive in one form or another enters into most of the specified reasons for leaving. For those classified under "better jobs" the question of wages is not supposed to have been the prime motive in making the change, but the governing causes for leaving were said to have been more desirable work, the location of the plant, etc. Under "nature of work" are classed a considerable number of quitters who under the stimulus of higher wages or the "work-or-fight" order entered mechanical occupations, but not being accustomed to the grease, dirt, noise, etc., inherent in the nature of the work, constantly have shifted in the hope of finding more pleasant work. It has been stated that the relative ease with which a job could be secured during the war period made workers more ready to throw up jobs which seemed undesirable to them, but which in normal times they would be reluctant to leave.

For those classified under "dissatisfied" no one specific reason seems to have been applicable. Employment managers believe that the question of wages or work is seldom a factor with this type of labor, but that its desire to shift is due largely to an inherent instability and that persons of this type are unable to assign any specific or logical reason for their desire to change. Employment managers believe these considerations to be equally true of a large number of those who failed to report before leaving. It is said that the number of employees leaving in this manner during the war period was greater than at any previous time. This is explained by the fact that the shortage of help necessi-

tated the employment of the so-called "floater," a type of workman which in normal times would not be employed at all by these concerns. It has been found to be characteristic of employees of this sort that they never stay on a job for more than a brief period, soon dropping out, without giving notice, to accept work elsewhere.

Under "incompetent," employment managers have classified certain workers who after a trial have been found to be unfit or unsuited for the work for which they were hired. It was pointed out that although these persons were willing to work they were found to be incapable of learning the work and were responsible for a great deal of spoiled work. This group also included workers who misrepresented their occupational skill when taken on, as, for example, by using certain acquired phrases that would indicate familiarity with the kind of work required of them. The number discharged for incompetency, it is asserted, increased during the war period because the urgent need of men made careful selection less possible. The management has classified those as "unreliable" whose attendance record was bad, who were habitually late in the morning, or who were prone to lay off too frequently and for trivial reasons. A good many of those discharged for being unreliable are suspected by employment managers of having looked for jobs, and possibly of having tried out jobs, in other plants, while absent.

Employment managers have classified as "trouble breeders" those who have attempted to create dissatisfaction among their fellow workers by urging or intimidating them to concerted action of some sort, as, for instance, the unionizing of the shop or the presentation of demands for wage increases, revision of piece or premium rates, etc. The relatively large number discharged for being "trouble breeders" may, perhaps, be explained by the fact that it is the policy of the establishments from which the figures of the above table have been secured to deal with their industrial workers only as individuals.

A somewhat detailed record of the number of people who left

the employ of a large mail order house during 1917 has been compiled and is presented in Table 27.

TABLE 27

REASONS ADVANCED FOR VOLUNTARY SEPARATION FROM SERVICE OF 13,664 EMPLOYEES AND CAUSES FOR DISCHARGE OF 2849 EMPLOYEES, DURING 1917, IN A MAIL ORDER HOUSE. (ESTABLISHMENT NO. 27–109)

REASONS FOR VOLUNTARY SEPARATION	CASES		CAUSE FOR DISCHARGE	CASES	
	NUMBER	PER CENT		NUMBER	PER CENT
Other positions:			Unsatisfactory:		
More promising position	2,080	15.2	Too slow	776	27.2
Better salary	1,109	8.1	Indifference	352	12.4
Former position and return to trade	268	2.0	Carelessness	255	9.0
Going into business	44	.3	Irregular attendance	309	10.8
To learn trade	48	.4	References	56	2.0
Position nearer home	62	.5	Dishonesty (suspected of pilfering, etc.)	473	16.6
Leaving city	2,047	15.0	Insubordination	327	11.5
To marry	229	1.7	Drinking	79	2.8
On account of health	823	6.0	Fighting	44	1.5
Dissatisfied:			Financial difficulties	13	.5
With working conditions	755	5.5	Enemy aliens	8	.3
With salary	221	1.6	Other causes	157	5.5
Work too hard	273	2.0			
Resented criticism	134	1.0			
Refused to be transferred	107	.8			
Refused temporary work	93	.7			
Did not like supervision	67	.5			
Distance too great	92	.7			
To go to school	565	4.1			
To stay at home	810	5.9			
No reason:					
Worked less than two weeks; failed to report	2,527	18.5			
Worked more than two weeks; failed to report	1,310	9.6			
Total	13,664	100.0	Total	2,849	100.0

During the year 1917 there occurred in this establishment 22,700 separations. Of this number 5204, or 22.9 per cent, were due to reduction of force and 983, or 4.3 per cent, to entrance into military service. Of the remaining separations, with the causes

of which we are here specifically concerned, 13,664, or 60.2 per cent of all, were voluntary, and 2849, or 12.6 per cent of all, were due to discharge.

It will be seen from the figures of Table 27 that of the total number of voluntary separations, about 25 per cent resulted from employees either having obtained more promising positions or positions which offered higher wages. The number "leaving city" seems to represent a considerable proportion of the total number leaving. It is very doubtful, however, whether this number really left the city; it is quite likely that in the majority of the cases it was only a proffered excuse. Those who were dissatisfied for various reasons number 12.8 per cent of the total. A significant commentary on the whole stability situation in this establishment is implicit in the rather large number of persons who simply dropped out of service without giving any notice of leaving, either in advance or subsequently — nearly 30 per cent of the total number leaving voluntarily left without giving notice.

Among the establishments whose labor turnover experience was examined in some detail by the Bureau of Labor Statistics was one of the largest department stores on the Pacific coast. This store went to no little trouble to ascertain the reasons for employees quitting and to tabulate not only the number quitting for various assigned reasons but also the number discharged for specified cause, assigned, naturally, by the company. This concern also kept account of the proportion of those rehired to new accessions. A full analysis of these records is given in a special report[1] published by the Bureau of Labor Statistics on the turnover experience of this department store. The tabular summary which appears in that report is herewith reproduced, with some modification, in Table 28.

The only classification of the accessions is into "hired new" and "rehired." During the nine months for which data were

[1] "Employment Policy and Labor Stability in a Pacific Coast Department Store," by P. F. Brissenden, 9 *Monthly Labor Review* 1399 (November, 1919).

TABLE 28

NUMBER, PER CENT DISTRIBUTION, AND ANNUAL RATE PER FULL-YEAR WORKER OF EMPLOYEES HIRED AND REHIRED AND OF THOSE LEAVING FOR SPECIFIED REASONS IN YEAR ENDING OCTOBER 31, 1918.

(Department Store. Establishment No. 216)

	NUMBER	PER CENT DISTRIBUTION	RATE PER FULL-YEAR WORKER [1]
Accessions: [2]			
Hired new	908	80	1.01
Rehired	223	20	.25
Total accessions	1,131	100	1.26
Separations:			
Discharged—			
Incompetent	21	34	.02
Misconduct	13	21	.01
Careless	8	13	.01
Unreliable	8	13	.01
Trouble breeder	5	8	.01
Dishonest	4	6	[3]
Lazy	2	3	[3]
Insubordinate	1	2	[3]
Total discharged	62	100	.07
Laid off	431		.48
Left voluntarily:			
Wages	228	21	.25
Family moving	154	14	.17
Other position	135	13	.15
School	127	12	.14
Ill health	117	11	.13
Needed at home	75	7	.08
Dissatisfied	48	4	.05
Vacation; needed rest	45	4	.05
War	39	4	.04
Marriage (women)	24	2	.03
Work too heavy or disagreeable	22	2	.02
All other reasons [4]	61	6	.07
Total left voluntarily	1,075	100	1.18
Total Separations	1,568		1.73

[1] Based on standard working force of 899 full-year workers.

[2] For nine months ending Oct. 31, 1918.

[3] Less than .005.

[4] "Leaving city," 33; "going into essential work," 6; "going into business," 3; on account of "housing conditions," 2; reasons unknown, 17.

available, it appears that 20 per cent of all of those hired had been in the company's service at some previous time. Among the reasons assigned for discharge the most frequent seem to have been incompetency, "misconduct," carelessness, and unreliability. Among those leaving voluntarily the most prevalent reasons given are dissatisfaction with wages, desire to take another position (which in some cases is desired because of the higher wage offered), family moving out of town, going to school, and ill health. Using the last column as a basis, it is evident that during the year reported, for each 100 full-time workers employed there were 101 entering the store as new employees, and, in addition, 25 former employees rehired. Turning to the separations, which are our primary concern here, it appears that, for every hundred full-year workers employed, there were 173 separations; 7 of these were discharges, 48 were lay-offs (on account of lack of work), and 118 were quits. Scrutinizing the latter more closely, we find that 25, for every hundred employed, quit on account of unsatisfactory wages, 17 quit because the family was moving, 15 on account of another job, 14 to enter school, 13 because of ill health, 8 because needed at home, 5 because "dissatisfied," the same number for a vacation (without pay) or a needed rest, and 4 for war work.

CHAPTER VII

Seasonal Influence on Labor Mobility

In the figures shown in the preceding chapters fluctuations in mobility rates from year to year with changing industrial conditions have been repeatedly observed. While the figures showing the mobility for the year as a whole reflect the sum total of the labor changes that have taken place during the year, they do not indicate the marked fluctuations in mobility at relatively short periods within the year, — fluctuations traceable to the successive vicissitudes of the industrial situation. For example, labor changes may occur with great intensity over a very short period in the year, while over the remainder of the year the changes may be very insignificant. Without showing their seasonal variations, this might make the figures for the years as a whole appear quite low, while actually at the same periods the labor change rates may have been far above the one shown for the year, and at other periods the rates may be considerably lower than the rate shown for the year as a whole.

SEASONAL AND CYCLICAL FLUCTUATIONS, 1910–19

The figures of Table 29 which show the monthly trend in flux rates from January, 1910, to December, 1919, inclusive, bring out in greater detail the existing variations in the mobility rates and the extent to which mobility figures immediately reflect the industrial conditions prevailing at the time.[1] The flux rate

[1] The figures of Table 29 are based upon following numbers of establishments reporting monthly figures:

1910 — 3 establishments		1915 — 30 establishments	
1911 — 6	"	1916 — 10	"
1912 — 8	"	1917 — 20	"
1913 — 39	"	1918 — 19	"
1914 — 26	"	1919 — 9	"

figures of Table 29 and, in addition, the corresponding accession and separation rates are shown in Chart F.[1] Since replacement rates, as explained above, correspond with accession rates when the accession rates are lower than the separation rates and with separation rates when separation rates are lower than accession

TABLE 29

LABOR FLUX RATES, BY MONTHS, FROM JANUARY, 1910, TO DECEMBER, 1919, INCLUSIVE[2]

MONTH	TOTAL LABOR CHANGE (FLUX) RATE PER FULL-TIME WORKER IN —										
	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	WHOLE PERIOD 1910–19
January	2.49	1.32	1.32	3.24	1.29	1.14	3.51	2.85	3.51	2.82	2.55
February	2.55	1.47	1.44	2.88	1.26	1.35	3.57	2.37	3.42	1.92	2.40
March	3.75	1.77	1.71	3.39	1.53	1.65	3.00	2.37	4.20	1.89	2.70
April	4.20	1.83	2.10	3.93	1.44	1.83	3.27	2.82	4.92	1.83	3.03
May	4.05	2.13	2.25	3.75	1.95	1.59	3.24	4.02	4.71	1.83	3.06
June	3.87	2.25	2.31	3.12	2.19	1.47	3.30	3.81	4.08	1.80	2.76
July	3.57	1.98	2.49	2.94	1.50	1.53	2.10	3.48	4.26	1.77	2.49
August	4.08	2.13	2.70	2.31	1.83	1.53	2.79	4.11	4.14	2.40	2.43
September	2.79	1.41	2.46	2.37	1.83	2.37	2.31	3.93	3.15	2.46	2.46
October	2.22	1.38	2.55	1.89	1.44	2.19	2.04	3.69	3.06	2.61	2.16
November	1.92	1.29	2.07	1.53	1.11	3.15	1.47	3.36	2.64	1.83	1.98
December	1.11	1.14	1.89	1.26	1.23	2.31	1.74	3.54	2.40	1.20	1.80
Year	3.05	1.67	2.11	2.72	1.55	1.84	2.70	3.36	3.71	2.03	2.48

rates, it follows that the lowest points on the chart mark the rate and trend of labor replacement. That is to say, whichever line happens to be the lowest marks replacement.

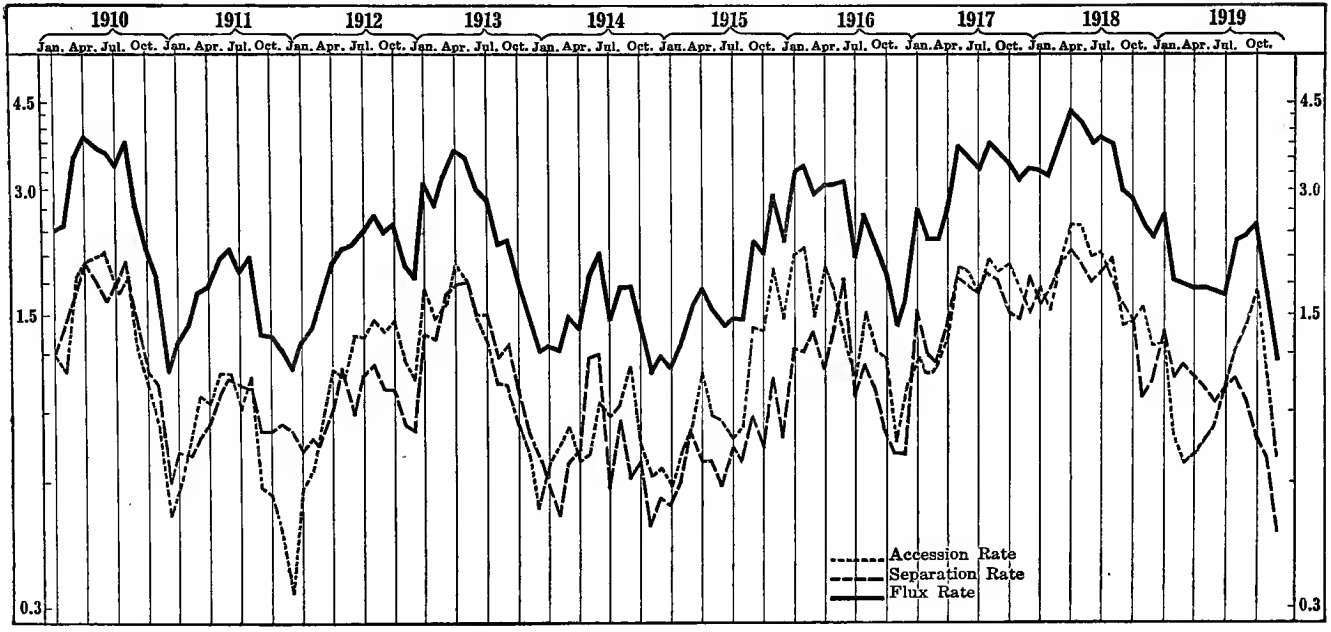
The monthly flux rate figures in the table show how wide a seasonal range of mobility is covered in each yearly rate. The flux rate was relatively high in 1910, a year of business expansion, but dropped during the depression period of 1911, falling in

[1] Figures for flux curve in Table 29; figures for other curves in Appendix, Table D. The chart has been reproduced, with some modification, from report on labor mobility, 10 *Mo. Labor Rev.* 1358.

[2] Reprinted after shifting of rates to full-year worker base, from report on "Mobility of Labor in American Industry," 10 *Mo. Labor Rev.* 1356 (June, 1920).

CHART F. FLUCTUATIONS IN LABOR MOBILITY, BY MONTHS, FROM JANUARY, 1910, TO DECEMBER, 1919, INCLUSIVE

(Unit: One labor change per full-time worker: Logarithmic scale of ordinates.)



December to the low flux (*i.e.* high stability) rate of 1.14, a degree of stability not again reached until the fall of 1914, in November of which year of business depression it fell to 1.11. The flux rate rose generally in 1912 and 1913, but dropped toward the end of 1913 and remained low during 1914 and until the fall of 1915, when it rose slightly, followed by a further rise and continued high mobility levels during the winter and spring of 1916. The summer and fall of 1916 and the winter of 1917 were periods of greater stability. In the late spring of 1917, after our entry into the war, the labor flux rate jumped to higher points than it had touched since the spring of 1913. There was — and this is an unusual circumstance — only a very slight increase in mobility during the following summer, fall, and winter. With the spring of 1918 the rate climbed again, and this time to high points not reached at any other time before or since, during the decade covered by the figures. The rate fell considerably during the summer and fall of 1918, and, despite the almost invariable tendency to rise in the spring, it continued low during the winter of 1919 and gradually fell during the spring, rising somewhat in the fall, but dropping sharply in November and December.

An examination of the chart will show that the very unusual decrease in mobility in the spring of 1919 was largely due to the fact that in addition to a marked decrease in the separation rate (unusual at this time of year) there was an even more pronounced drop in the accession rate. It is evident, also, that in the fall of 1919 the accession rate rose rapidly until October, and then dropped rapidly, while the separation rate continued to drop through the summer and fall.

SEASONAL FLUCTUATIONS IN INDIVIDUAL ESTABLISHMENTS

The seasonal fluctuations in labor mobility as they occur in a machine tool manufacturing plant are shown in Table 30, on page 107. The figures show for the four-year period 1916–19 not only the monthly trend in the flux, for the work force as a whole, but also the monthly trend for the same period for the day and

night forces separately. Attention has been called above, in the discussion of Table 18, to the fact that the night force in this establishment is nearly three times as mobile as the day force. Table 30 naturally shows up the same difference in

TABLE 30

RATE OF TOTAL LABOR CHANGE (LABOR FLUX RATE) OF DAY AND NIGHT FORCES OF A MACHINE TOOL MANUFACTURING ESTABLISHMENT (NO. 35–144), 1916–1919

MONTH	RATE OF TOTAL LABOR CHANGE (LABOR FLUX) PER FULL-TIME WORKER IN EACH SPECIFIED MONTH											
	DAY FORCE				NIGHT FORCE				TOTAL WORKING FORCE			
	1916	1917	1918	1919	1916	1917	1918	1919	1916	1917	1918	1919
January	2.28	2.41	1.92	2.25	7.68	3.18	7.98	4.05	3.33	1.71	3.27	2.43
February	2.70	1.86	1.80	.69	5.97	5.46	4.89	.87	2.40	2.55	2.52	.72
March	2.64	1.77	2.49	.69	8.04	7.35	4.41	.39	3.90	2.79	2.94	.66
April	3.78	1.98	3.75	.75	5.22	7.29	5.25	1.77	4.11	2.97	4.08	.84
May	4.83	1.98	2.58	.66	10.59	8.34	4.86	1.23	6.09	3.15	3.06	.72
June	2.94	2.46	2.58	1.32	9.60	8.76	6.42	2.37	4.56	3.75	3.39	1.41
July	3.27	2.82	2.64	1.74	7.77	9.66	6.30	7.35	4.29	4.23	3.42	2.43
August	2.82	3.09	3.81	1.80	7.89	6.00	8.55	9.00	3.96	4.26	4.77	3.00
September	2.70	3.21	3.06	1.35	6.42	5.82	5.01	6.09	3.48	3.72	3.51	2.26
October	2.25	2.55	1.65	1.89	8.82	6.72	3.78	5.85	3.21	3.39	2.13	2.78
November	1.83	2.40	2.67	1.47	6.00	8.52	7.68	5.13	2.70	3.54	3.66	2.28
December	1.26	2.37	.72	1.26	2.76	5.40	1.77	3.33	1.53	3.03	.87	1.77
Total	2.73	2.34	2.49	1.35	7.11	7.11	5.70	4.59	3.72	3.27	3.18	1.83

stability and demonstrates, furthermore, that, except in March, 1919, there was no month during the whole four-year period that did not show greater stability for the day force.

SEASONAL CHANGES AMONG DIFFERENT OCCUPATIONS

The figures given in the last two tables refer to the monthly trend in the mobility rates of the general body of employees without reference to seasonal fluctuations of given occupations within the work force. In one of the large car-building plants (Establishment No. 102) employment records were kept in such form that the monthly labor flux rates of some of the more

TABLE

LABOR FLUX RATES FOR EACH MONTH IN SELECTED OCCUPATIONS IN A CAR-

OCCUPATION	RATE OF TOTAL LABOR CHANGE (FLUX RATE) PER FULL-TIME WORKER FOR THE YEAR	RATE OF TOTAL LABOR CHANGE (FLUX				
		JUNE	JULY	AUG.	SEPT.	OCT.
Assemblers, filers, and welders	3.12	2.04	1.65	6.03	4.68	1.92
Blacksmiths	2.49	1.02	2.25	7.11	5.40	1.50
Bookkeepers, clerks, etc.	2.25	3.54	2.67	2.04	1.95	2.13
Cabinet makers	2.39	2.28	2.52	1.23	2.19	2.34
Car body builders	7.77	10.17	10.14	8.91	8.19	5.67
Car bottom builders	2.21	3.60	4.62	3.69	1.35	2.07
Car electricians	4.77	5.43	5.49	4.83	4.47	3.33
Car steam fitters	6.44	6.09	5.31	8.55	5.88	4.29
Car truck builders	4.74	5.52	4.95	12.21	8.13	2.67
Die and tool makers	2.90	2.07	2.31	4.50	3.90	3.09
Hammersmiths	2.64	3.09	1.98	6.00	2.25	2.25
Inside car finishers	1.98	3.24	2.31	2.67	2.67	1.08
Inside car trimmers	1.74	2.25	1.71	2.13	.87	.57
Laborers	10.80	7.47	7.35	9.90	8.01	10.71
Machinists, bench machinists, etc.	3.03	2.37	2.43	4.56	3.51	2.34
Millwrights	5.61	2.91	4.47	8.94	7.47	5.34
Painters	3.78	4.92	4.38	5.91	2.46	3.75
Riveters	11.76	18.96	14.40	14.22	12.15	12.42
Roof fitters	3.51	2.55	3.06	3.27	5.25	4.26
Shearsmen, punch-press operators, etc.	6.66	5.16	8.07	11.31	8.43	7.11
Tinners	2.70	3.33	3.33	3.78	3.18	4.35
Upholsterers	3.39	5.16	2.49	5.13	2.58	2.70
Wood machine operators	5.10	5.16	2.76	5.31	3.09	6.54

important occupations within the plant could be computed. The rates are shown in Table 31 above.

The flux rates given here not only show very wide differences between the different occupations, but reveal even more marked fluctuations from month to month in each occupation. The highest flux rates and at the same time the widest range of rates during the year ending May 31, 1918, were for riveters, whose rates ranged from 18.96 in June down to 5.85 in December, with a flux rate for the year of 11.76, which means nearly 12 labor changes for every riveter in the standard work force of riveters — changes equivalent to six complete overturns of the riveting

31

BUILDING PLANT (ESTABLISHMENT NO. 102) FOR YEAR ENDED MAY 31, 1918

RATE) PER FULL-TIME WORKER FOR EACH SPECIFIED MONTH							OCCUPATION
NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	
1.53	1.77	1.74	4.23	6.39	4.17	5.34	Assemblers, filers, and welders
.96	1.71	2.40	.96	1.71	1.65	3.33	Blacksmiths
1.38	1.44	1.35	1.02	1.95	3.48	4.11	Bookkeepers, clerks, etc.
2.10	1.02	.75	1.95	5.25	4.71	2.70	Cabinet makers
5.62	5.13	6.75	5.07	1.68	5.97	10.68	Car body builders
.93	1.26	1.62	.96	2.19	.90	2.55	Car bottom builders
5.62	4.83	5.28	3.48	4.32	7.26	6.81	Car electricians
7.68	6.00	6.20	4.14	7.47	7.14	8.31	Car steam fitters
2.22	1.95	4.20	3.84	2.94	1.62	3.57	Car truck builders
2.82	2.19	1.71	2.85	2.40	3.03	3.66	Die and tool makers
1.71	2.64	1.56	.75	2.25	2.13	3.66	Hammersmiths
1.38	.96	.84	3.36	1.62	1.83	1.05	Inside car finishers
2.22	1.50	1.20	3.33	1.71	1.65	2.25	Inside car trimmers
11.07	12.21	12.06	9.18	13.83	14.40	14.28	Laborers
3.21	3.03	2.49	2.37	3.57	3.00	4.02	Machinists, bench machinists, etc.
5.61	6.09	3.72	5.07	5.58	6.21	6.12	Millwrights
3.81	1.92	2.13	4.17	3.81	3.30	4.56	Painters
7.56	5.85	6.24	8.94	13.92	8.01	13.71	Riveters
3.00	1.68	2.85	4.68	5.16	2.61	4.38	Roof fitters
6.42	4.38	3.72	4.32	7.29	5.31	9.48	Shearsmen, punch-press operators, etc.
3.78	3.09	.96	1.23	2.13	1.50	1.47	Tinners
2.61	1.98	1.32	3.99	4.20	2.88	6.60	Upholsterers
4.56	1.95	2.01	5.10	7.95	9.75	6.45	Wood machine operators

personnel. The next highest flux level and the next widest range from month to month occurred among common laborers, whose flux rate ranged from 14.40 in April down to 7.35 in July, with a flux rate for the year of 10.80, — this being equivalent to 5½ complete overturns of the common labor section of the work force. The lowest occupational flux rate in the plant was for inside car trimmers, in whose case the flux rate ranged from .57 in October to 3.33 in February, with a rate of 1.74 for the year, a rate equivalent to less than one complete overturn of the inside car-trimming section of the work force. In most of the occupations shown the mobility rates are generally low during the winter

months as compared with the rates for the year. In these monthly figures of the mobility of occupations one may see how the various factors of influence previously mentioned are immediately reflected in the mobility figures from month to month.[1]

NORMAL SEASONAL CHANGES IN STABILITY

A composite picture of the seasonal fluctuations in labor mobility over an extended period of time can be constructed from the monthly mobility rates for the period 1910–1919. Such a picture will naturally iron out the irregularities due to business fluctuations from year to year and show what may be called the normal seasonal trend in labor mobility. The figures are presented in Tables 32 and 33 where the monthly figures (shown in Table D in the Appendix) for each month of each year of the decade covered are brought together in such a way as to combine the figures for identical months (Table 32) and for the four seasons of the year (Table 33). The rate figures of Table 32 are presented graphically in Chart G, on page 112.

It is believed, as already suggested, that such a combination of the figures as is shown in these two tables effectively neutralizes most of those factors in mobility which are of a purely industrial character and that, as a result, the influence of the different seasons is more accurately reflected. The figures indicate a uniform tendency to maximum labor mobility in the spring, a gradual lessening of mobility during the summer and early fall, which is the period of minimum mobility, and finally an increase during the late fall and winter, culminating again in the maximum mobility period of the following spring. These conclusions are confirmed by the curves of Chart G. The high mobility rates in the spring months indicate that the shiftings are indeed much more numerous at that season of the year. The number of

[1] See also Table 20 above, where mobility rates for some of the same occupation groups given in Table 31 are shown for this same establishment for the year as a whole.

accessions and separations in the months of March, April, and May are not only greatest in relation to the number of workers employed, but in themselves are greater in this three-month period than in any other period shown. Here, doubtless, may be seen the psychological effect which spring appears to have

TABLE 32

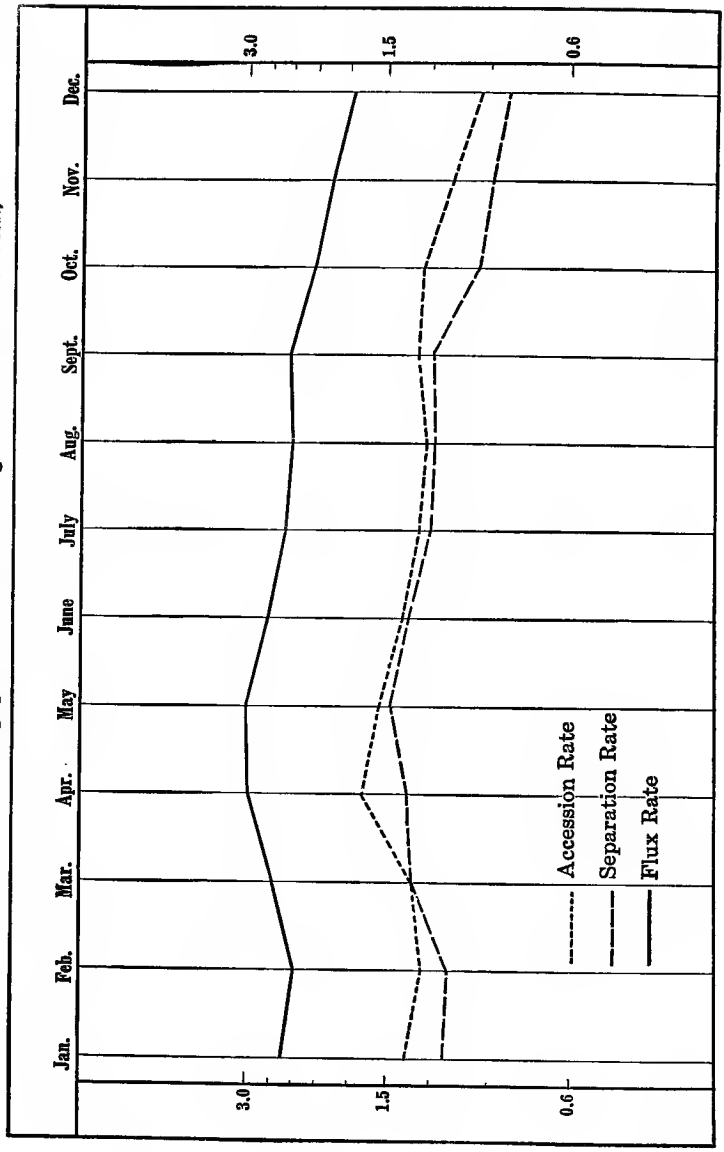
MONTHLY TREND IN LABOR MOBILITY

(Based on monthly data for all years from 1910–19 combined)

MONTH	NUMBER OF FULL-TIME WORKERS[1]	TOTAL LABOR HOURS (THOUSANDS)	LABOR CHANGES		
			ACCESSIONS	SEPARATIONS	TOTAL (FLUX)
			NUMBER		
January	465,554	116,388	53,992	44,363	98,355
February	465,568	116,391	49,790	43,255	93,045
March	473,943	118,485	53,523	53,209	106,732
April	467,072	116,767	65,025	53,363	118,388
May	474,200	118,551	61,934	58,873	120,807
June	468,126	117,032	54,039	53,259	107,298
July	463,484	115,870	48,297	47,482	95,779
August	462,126	115,530	47,889	46,087	93,976
September	469,831	117,458	51,127	44,971	96,098
October	485,420	121,356	47,966	38,800	86,776
November	481,858	120,464	43,793	35,474	79,267
December	479,106	119,777	38,241	33,163	71,404
Year	471,357	1,414,069	615,616	552,299	1,167,915
			RATE PER FULL-TIME WORKER		
January			1.39	1.14	2.53
February			1.28	1.12	2.40
March			1.36	1.35	2.71
April			1.67	1.37	3.04
May			1.57	1.49	3.06
June			1.39	1.37	2.76
July			1.25	1.23	2.48
August			1.25	1.20	2.45
September			1.31	1.15	2.46
October			1.19	.96	2.15
November			1.09	.88	1.97
December			.96	.83	1.79
Year			1.31	1.17	2.48

[1] The figures are obtained in this way: $\frac{116,388,000}{\frac{3000}{12}}$.

CHART G. MONTHLY TREND IN LABOR MOBILITY: IDENTICAL MONTHS, 1910–19
(Unit: One labor change per full-time worker: Logarithmic scale of ordinates.)



upon the workman, that is, a certain restlessness and desire for change — in jobs, places of abode, etc., — made easier because of the opening up of industrial outdoor work and greater activity in agriculture, lumbering, etc. At this period, too, the condi-

TABLE 33

EXTENT OF LABOR MOBILITY IN THE FOUR SEASONS OF THE YEAR[1]

(Based on the monthly data of the four seasons for all years from 1910–19, combined)

MONTH	NUMBER OF FULL-TIME WORKERS[2]	TOTAL LABOR HOURS (THOUSANDS)	LABOR CHANGES		
			ACCESSIONS	SEPARATIONS	TOTAL (FLUX)
			NUMBER		
March, April, May . .	471,738	353,803	180,482	165,445	345,927
June, July, August . .	464,579	348,432	150,225	146,828	297,053
Sept., Oct., Nov. . . .	479,036	359,278	142,886	119,245	262,131
Dec., Jan., Feb. . . .	470,076	352,556	142,023	120,781	262,804
Total	471,357	1,414,069	615,616	552,299	1,167,915
			RATE PER FULL-TIME WORKER		
March, April, May . .			1.53	1.40	2.93
June, July, August . .			1.29	1.26	2.55
Sept., Oct., Nov. . . .			1.19	1.00	2.19
Dec., Jan., Feb. . . .			1.21	1.03	2.24
Total			1.31	1.17	2.48

tions of living are more easily met. The relatively high mobility rates still prevailing during the summer months no doubt indicate the influence of the hot weather upon the industrial stability of the employee. In the fall of the year when colder weather sets in and living conditions are harder to meet, there is a noticeable drop in the labor change rate as a whole. It is especially interest-

[1] Reprinted, after shifting rates to full-year-worker base, from report on labor mobility, 10 *Mo. Labor Rev.* 1356 (June, 1920).

[2] The figures are obtained in this way: $\frac{353,803,000}{\frac{3000}{4}}$.

ing to note that the proportion of accessions as compared with the proportion of separations is relatively greater during the months of September, October, and November, indicating a tendency for workers to flock back to steadier employment after a period of restlessness and moving about. There is also noticeable a very slight increase in the mobility rates of the winter months over the fall period, which is perhaps indicative, on the one hand, of a more intensive application of the country's productive forces, and on the other, of changes which are often made by individuals at the end of the old and the beginning of the new year.

CHAPTER VIII

Length of Service as a Factor in Labor Mobility

In the preceding discussion of labor mobility one very important factor, that of length of service, has been only briefly touched upon in connection with an analysis of accessions.[1] Monthly and yearly figures expressed in the form of accession, separation, and flux rates are valuable for the purpose of showing the general extent of mobility in the labor force as a whole and its trend during any given period of time. Such figures, however, do not throw much light on the degree of stability within the working force, in so far as it relates to the length of service of the active as well as the separated employees, without which no correct idea can be formed of the relative extent of labor mobility. It is evident that in the working force as a whole, or in its sex, occupation, or other subdivisions, the turnover is not equally distributed, because of the varying frequency with which the jobs in each such group may be abandoned by the job holders. It is obvious that the length of time for which jobs are held by individual employees who leave those jobs, is a highly important factor in determining the incidence of labor mobility within the establishment work force. This for the reason that the shorter the service of separated employees, the more frequent the job replacements which they occasion, and the higher the resulting establishment labor mobility figures.

Moreover, from the standpoint of an individual establishment eager to maintain an esprit de corps in the plant, and for that reason bent upon minimizing its labor changes, the length of service of its employees becomes an all-important factor. In

[1] See Table 12. Further applications of the length of service data are made in Chapters IX and X.

order to guarantee that team-work which is essential in modern factory production, and which is the result of long association of the same groups of workmen, effort must be made to prevent employees of long standing from leaving the employ of the concern. The retention in service of long-service employees is especially important from the standpoint of the cost of replacement, as it is generally agreed that as the length of service of the employee increases, his value to the organization is also enhanced. If, however, the severance of connection of an employee becomes unavoidable, it is of importance to retain — assuming that he proves to be desirable — the newly hired employee who is taken on to replace the one who has left. This is also true of those employees hired to enlarge the working force. It is quite obvious that there must be a heavy expense attached to the constant breaking in of new employees. This expense is enormous, even without considering the cost of spoiled work, decreased production, and industrial accidents which inevitably follow as a result of this everlasting shifting.

The experience of 34 establishments in 1913–14 and 53 in 1917–18 which furnished comprehensive figures on the length of service of their active employees as well as of those who left their employ, is summarized in Table 34, on page 117.

If we consider those employees having to their credit not more than one year of service as short-service employees, it will be noticed in this table that the proportion of such employees in the active work force is rather extensive. On the other hand, considerable proportions among the active employees are found to have long-service records. This proportion of long-service employees in industrial establishments was considerably reduced during the war period, slightly over 71 per cent of those on the pay roll in 1913–14 having had over one year's continuous service, while in 1917–18 the proportion was only 60 per cent. There are, of course, wide variations in the extent to which individual establishments have short- and long-service employees in the active working force. Space limitations, however, make

TABLE 34

LENGTH-OF-SERVICE DISTRIBUTION OF "ACTIVE EMPLOYEES" (THOSE ON PAY ROLL AT END OF YEAR) AND OF EMPLOYEES WHO LEFT DURING THE YEAR ("SEPARATING EMPLOYEES")[1]

[Number of establishments reporting, 1913–14, 34; 1917–18, 53]

LENGTH-OF-SERVICE GROUP	NUMBER IN EACH GROUP			
	ON PAY ROLL AT END OF YEAR		SEPARATED FROM SERVICE DURING YEAR	
	1913–14	1917–18	1913–14	1917–18
1 week or less	—	1,615	—	16,476
Over 1 week to 2 weeks	—	1,793	—	9,664
Over 2 weeks to 1 month	—	2,948	—	11,541
Over 1 month to 3 months	—	7,055	—	18,912
Three months or less	11,365	13,411	28,407	56,593
Over 3 months to 6 months	6,396	6,019	8,516	11,770
Over 6 months to 1 year	7,188	9,018	7,497	9,813
Over 1 year to 2 years	10,446	10,458	4,415	6,645
Over 2 years to 3 years	9,632	6,627	2,162	2,476
Over 3 years to 5 years	12,980	6,320	1,845	2,780
Over 5 years	28,443	19,916	1,776	3,015
Total	86,450	71,769	54,618	93,092
	PER CENT IN EACH GROUP			
1 week or less	—	2.3	—	17.7
Over 1 week to 2 weeks	—	2.5	—	10.4
Over 2 weeks to 1 month	—	4.1	—	12.4
Over 1 month to 3 months	—	9.8	—	20.3
Three months or less	13.1	18.7	52.0	60.8
Over 3 months to 6 months	7.4	8.4	15.6	12.6
Over 6 months to 1 year	8.3	12.6	13.7	10.5
Over 1 year to 2 years	12.1	14.6	8.1	7.1
Over 2 years to 3 years	11.1	9.2	4.0	2.7
Over 3 years to 5 years	15.0	8.8	3.4	3.0
Over 5 years	32.9	27.8	3.3	3.2
Total	100.0	100.0	100.0	100.0

it impossible to present length of service data by individual establishments.

As might be expected, the length-of-service figures of the separated employees present a striking contrast to those shown

[1] Reprinted from report on labor mobility, 10 *Mo. Labor Rev.* 1357 (June, 1920).

for the active working forces. This undoubtedly reflects the influence of unusual industrial activity in both of the periods studied, but more especially the effect of war-time conditions upon labor mobility. It is apparent from the figures of Table 34

TABLE

LENGTH OF SERVICE OF EMPLOYEES ON PAY ROLL AT END OF YEAR ("ACTIVE OF WAR AND PRE-WAR PERIODS,

[1913–14: 34 establishments;

INDUSTRY GROUP	NUMBER OF ESTABLISHMENTS	NUMBER OF WORKERS[1]	PERCENTAGE DISTRIBUTION IN HAD WORKED		
			3 MONTHS OR LESS	OVER 3 MONTHS TO 6 MONTHS	OVER 6 MONTHS TO 1 YEAR
1913–14					
Automobiles and parts mfg.	4	5,838	26	10	5.8
Chem. indust's and refineries	1	1,234	6	13	45
Clothing and textile mfg.	3	6,052	8	4	3
Furniture and millwork	—	—	—	—	—
Leather and rubber goods	2	4,093	15	9	15
Machinery mfg.	5	10,407	19	8	10
Mercantile establishments	2	3,353	25	8	9
Miscellaneous metal products	9	17,966	18	9	6
Printing and publishing	4	4,380	13	5	4
Public utilities:					
Gas and electricity	—	—	—	—	—
Street railways	2	7,613	7	6	5
Telephone service	2	25,514	6	6	9
Total	34	86,450	13	8	8
1917–18					
Automobiles and parts mfg.	5	8,515	24	13	15
Chem. indust's and refineries	3	3,848	36	13	16
Clothing and textile mfg.	3	6,371	12	10	9
Furniture and millwork	1	1,693	22	6	16
Leather and rubber goods	—	—	—	—	—
Machinery mfg.	13	18,264	20	6	11
Mercantile establishments	3	1,451	22	6	15
Miscellaneous metal products	13	6,160	24	8	12
Printing and publishing	2	940	12	6	6
Public utilities:					
Gas and electricity	1	1,841	18	13	15
Street railways	1	4,208	22	12	11
Telephone service	8	18,478	11	6	13
Total	53	71,769	19	8	13

[1] These figures represent the aggregate number of employees on pay rolls at end of year.

that, in the period 1917–18, out of a total of 93,092 separated employees, over 41 per cent had, on severing their connections, served periods of one month or less, 33 per cent had worked from one to six months, about 11 per cent from six months to one year,

35 *a*

EMPLOYEES") WHO HAD SERVED SPECIFIED PERIODS OF TIME. COMPARISON BY INDUSTRY GROUPS

1917–18: 53 establishments]

EACH INDUSTRY GROUP OF ACTIVE EMPLOYEES WHO CONTINUOUSLY:—					INDUSTRY GROUP
OVER 1 YEAR TO 2 YEARS	OVER 2 YEARS TO 3 YEARS	OVER 3 YEARS TO 5 YEARS	OVER 5 YEARS	TOTAL	
					1913–14
14	9	14	21	100	Automobiles and parts mfg.
13	5	8	10	100	Chem. industries and refineries
9	11	14	51	100	Clothing and textile mfg.
—	—	—	—	—	Furniture and millwork
20	14	10	17	100	Leather and rubber goods
7	8	16	32	100	Machinery mfg.
14	26	8	10	100	Mercantile establishments
8	12	15	32	100	Miscellaneous metal products
14	14	18	32	100	Printing and publishing
					Public utilities:
—	—	—	—	—	Gas and electricity
14	12	11	45	100	Street railways
15	10	18	36	100	Telephone service
12	11	15	33	100	Total
					1917–18
14	9	13	12	100	Automobiles and parts mfg.
12	5	6	12	100	Chem. industries and refineries
15	12	13	29	100	Clothing and textile mfg.
11	5	5	35	100	Furniture and millwork
—	—	—	—	—	Leather and rubber goods
15	11	5	32	100	Machinery mfg.
10	5	7	35	100	Mercantile establishments
15	10	7	24	100	Miscellaneous metal products
13	7	7	49	100	Printing and publishing
					Public utilities:
17	11	7	19	100	Gas and electricity
12	6	5	32	100	Street railways
16	9	12	32	100	Telephone service
14	9	9	28	100	Total

and a total of 84 per cent had to their credit continuous service records of one year or less. Although in both periods there had also been a considerable exodus of long-service employees — 18.8 per cent of all separating employees in 1913–14 and 16 per

TABLE

LENGTH OF SERVICE OF EMPLOYEES (SEPARATING EMPLOYEES) WHO LEFT OF WAR AND PRE-WAR PERIODS,

[1913–14: 34 establishments;

INDUSTRY GROUP	NUMBER OF ESTABLISHMENTS	TOTAL NUMBER OF SEPARATING EMPLOYEES	PERCENTAGE DISTRIBUTION IN EACH HAD WORKED		
			3 MONTHS OR LESS	OVER 3 MONTHS TO 6 MONTHS	OVER 6 MONTHS TO 1 YEAR
1913–14					
Automobiles and parts mfg.	4	8,354	73	9	9
Chem. indust's and refineries	1	1,395	73	16	5
Clothing and textile mfg.	3	3,097	48	12	9
Furniture and millwork	—	—	—	—	—
Leather and rubber goods	2	3,975	47	19	19
Machinery mfg.	5	6,075	55	14	12
Mercantile establishments	2	1,778	55	12	12
Miscel. metal products mfg.	9	12,384	51	16	14
Printing and publishing	4	2,760	51	16	15
Public utilities:					
Gas and electricity	—	—	—	—	—
Street railways	2	3,603	38	25	18
Telephone service	2	11,197	41	18	18
Total	34	54,618	52	16	14
1917–18					
Automobiles and parts mfg.	5	13,282	49	17	16
Chem. indust's and refineries	3	8,980	80	9	6
Clothing and textile mfg.	3	8,587	58	11	11
Furniture and millwork	1	4.030	70	12	8
Leather and rubber goods	—	—	—	—	—
Machinery mfg.	13	18,197	59	13	11
Mercantile establishments	3	1,862	63	12	10
Miscel. metal products mfg.	13	15,226	77	9	6
Printing and publishing	2	930	48	10	10
Public utilities:					
Gas and electricity	1	1,040	44	15	14
Street railways	1	3,728	53	17	13
Telephone service	8	17,230	50	14	12
Total	53	93,092	61	13	10

cent in 1917–18 being employees with service records of over one year — a census of the active employees taken at the end of the period shows, nevertheless, large proportions of employees of long tenure; figures for 1913–14 show 38.2 per cent with con-

35 *b*

DURING YEAR WHO HAD SERVED SPECIFIED PERIODS OF TIME. COMPARISON BY INDUSTRY GROUPS

1917–18: 53 establishments]

INDUSTRY GROUP OF SEPARATING EMPLOYEES WHO CONTINUOUSLY:—					INDUSTRIAL GROUP
OVER 1 YEAR TO 2 YEARS	OVER 2 YEARS TO 3 YEARS	OVER 3 YEARS TO 5 YEARS	OVER 5 YEARS	TOTAL	
					1913–14
5	2	1	1	100	Automobiles and parts mfg.
3	1	1	1	100	Chem. industries and refineries
9	5	7	10	100	Clothing and textile mfg.
—	—	—	—	—	Furniture and millwork
7	3	3	2	100	Leather and rubber goods
6	5	4	4	100	Machinery mfg.
13	4	2	2	100	Mercantile establishments
9	4	4	2	100	Miscellaneous metal products mfg.
9	4	4	1	100	Printing and publishing
					Public utilities:
—	—	—	—	—	Gas and electricity
10	3	2	4	100	Street railways
10	5	4	4	100	Telephone service
8	4	3	3	100	Total
					1917–18
7	5	4	2	100	Automobiles and parts mfg.
2	1	1	1	100	Chem. industries and refineries
9	3	5	3	100	Clothing and textile mfg.
4	1	1	4	100	Furniture and millwork
—	—	—	—	—	Leather and rubber goods
10	2	2	3	100	Machinery mfg.
5	2	3	5	100	Mercantile establishments
4	1	1	2	100	Miscel. metal products mfg.
10	6	6	11	100	Printing and publishing
					Public utilities:
12	5	5	5	100	Gas and electricity
7	2	3	5	100	Street railways
9	3	6	6	100	Telephone service
7	3	3	3	100	Total

tinuous service records from one to five years, and 32.9 per cent with service records of over five years, and figures for 1917–18 show 32.9 per cent of all active employees with service records of over one to five years and 27.8 per cent with continuous service records of over five years.

A count of the actual length of service of 439 separated employees in two establishments in the one-week-or-less group showed the number of employees having had specified days of service to be as follows: Less than one day of service, 21 employees; one day, 94 employees; 2 days, 57 employees; 6 days, 111 employees. This shows that over 25 per cent worked one day or less, about 80 per cent worked from two to five days, and only a little over 25 per cent worked a full week.

The results of a separate study of the relative proportions of active and separated employees who had served specified periods of time are shown by industry groups in Tables 35 *a* and 35 *b*.

In both periods rather marked variations may be observed in the relative proportions, in the different industry groups, of those in service at the end of the year and those separated during the year. The extent to which any industry group has long-service employees in the active work force will depend, of course, on the seasonal character of the industry, whether the work force has recently been extended, whether the plant has reduced its force by lay-off of those most recently hired, or on all of these factors combined. In the first two cases there will very probably be found a relatively smaller proportion of long-service employees, while in the last case the number of employees of long tenure will be relatively larger. In the case of the active employees, the influx of new workers during the war period due to enlarged industrial activities may be seen in the proportion of those having short-service records in 1917–18 as compared with 1913–14. In both periods employees of long tenure are found to a greater or less extent in all industry groups shown, the proportion of employees with over 5 years' service being in some cases almost one-half the total active working force. However, the

enormous shifting of workers which took place during the war period, especially in war industries, is strikingly illustrated by the figures for separated employees. It will be observed that some industry groups show as high a proportion as 80 per cent of all the separated employees to have worked three months or less. The proportion of separated employees who had served one week or less appears to have been in some industry groups as high as from 60 to 80 per cent. A considerable number of long-service employees were lost to the different establishments during the war period, as may be seen from the rather large proportions of long-time employees who left the service in some industry groups.

COMPARATIVE SERVICE STABILITY OF MALES AND FEMALES

The figures shown in Tables 36, 37 and 38 are the result of a special study of the relative importance of the length of service as a factor in labor mobility in industrial establishments as between males and females. Table 36 summarizes for the war period the experience of 28 establishments in that regard. The figures of this table are presented graphically in Chart H on page 125. Table 36 shows the proportions of the males and females in the working force to be about equally divided in the lower length of service groups, the females having higher proportions in the service groups between six months and five years, but showing a much greater proportion of males in the over-five-years group. A comparison of the length of service of the separated male and female employees shows that larger proportions of separating male employees than females are bunched in the short-service periods. Thus, 63 per cent of the total number of separating males as against 50 per cent of the females had served less than three months. In the groups over-six-months-to-a-year the proportions are about equally divided. In the long-time-service groups of separated employees the figures for males show that they are less prone to sever connections with an establishment after having worked in it a consider-

able period of time. Of all the separating females whose service records were reported, 18.7 per cent had served over one to five years, whereas only 11.3 per cent of all the separating males

TABLE 36

LENGTH-OF-SERVICE DISTRIBUTION OF "ACTIVE EMPLOYEES" (I.E., THOSE ON PAY ROLL AT END OF YEAR) AND OF EMPLOYEES WHO LEFT DURING THE YEAR ("SEPARATING EMPLOYEES"), CLASSIFIED ACCORDING TO SEX, 1917–18.

LENGTH-OF-SERVICE PERIOD	EMPLOYEES ON PAY ROLL AT END OF YEAR (ACTIVE EMPLOYEES) WHO HAD WORKED SPECIFIED PERIOD		SEPARATED EMPLOYEES WHO HAD WORKED SPECIFIED PERIOD	
	MALE	FEMALE	MALE	FEMALE
	NUMBER			
1 week or less	781	328	7,654	2,180
Over 1 week to 2 weeks	886	370	4,236	1,077
Over 2 weeks to 1 month	1,446	541	5,508	1,174
Over 1 month to 3 months	3,247	1,633	8,839	2,686
Over 3 months to 6 months	2,506	1,386	5,225	1,884
Over 6 months to 1 year	3,554	2,508	4,042	1,824
Over 1 year to 2 years	4,411	2,831	2,991	1,313
Over 2 years to 3 years	2,654	1,583	755	544
Over 3 years to 5 years	2,037	1,969	963	832
Over 5 years	11,853	3,654	1,473	857
Total	33,375	16,803	41,686	14,371
	PER CENT			
1 week or less	2.3	2.0	18.4	15.2
Over 1 week to 2 weeks	2.7	2.2	10.2	7.5
Over 2 weeks to 1 month	4.3	3.2	13.2	8.2
Over 1 month to 3 months	9.7	9.7	21.2	18.7
Over 3 months to 6 months	7.5	8.2	12.5	13.1
Over 6 months to 1 year	10.6	15.0	9.7	12.7
Over 1 year to 2 years	13.2	16.8	7.2	9.1
Over 2 years to 3 years	8.0	9.4	1.8	3.8
Over 3 years to 5 years	6.1	11.7	2.3	5.8
Over 5 years	35.5	21.7	3.6	6.0
Total	100.0	100.0	100.0	100.0

had served over one to five years. Finally, of the employees leaving after having served continuously more than five years 3.6 per cent were males and 6.0 per cent were females.

CHART H. LENGTH-OF-SERVICE DISTRIBUTION OF "ACTIVE" AND "SEPARATED" EMPLOYEES, CLASSIFIED BY SEX, 1917–18

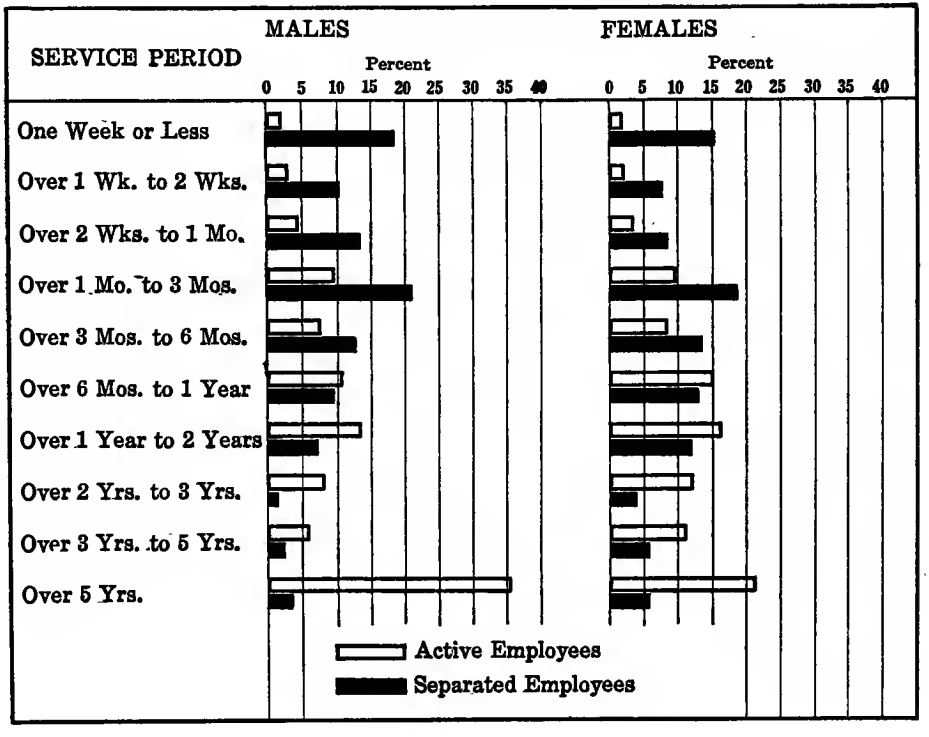


TABLE 37

LENGTH-OF-SERVICE DISTRIBUTION OF "ACTIVE EMPLOYEES" (I.E., THOSE ON PAY ROLL AT END OF YEAR) CLASSIFIED ACCORDING TO SEX, 1913–14 AND 1917–18

(Number of establishments reporting, 1913–14, 30; 1917–18, 28)

LENGTH-OF-SERVICE PERIOD	EMPLOYEES ON PAY ROLL AT END OF YEAR (ACTIVE EMPLOYEES) WHO HAD WORKED CONTINUOUSLY SPECIFIED PERIODS OF TIME —			
	MALE		FEMALE	
	1913–14	1917–18	1913–14	1917–18
	NUMBER			
1 week or less	—	781	—	328
Over 1 week to 2 weeks	—	886	—	370
Over 2 weeks to 1 month	—	1,446	—	541
Over 1 month to 3 months	—	3,247	—	1,633
Three months or less	8,994	6,360	2,865	2,872
Over 3 months to 6 months	6,738	2,506	1,867	1,386
Over 6 months to 1 year	6,636	3,554	2,635	2,508
Over 1 year to 2 years	10,245	4,411	4,722	2,831
Over 2 years to 3 years	8,996	2,654	3,641	1,583
Over 3 years to 5 years	12,584	2,037	4,694	1,969
Over 5 years	27,316[1]	11,853	6,454[1]	3,654
Total	81,509	33,375	26,878	16,803
	PER CENT IN EACH GROUP			
1 week or less	—	2.3	—	2.0
Over 1 week to 2 weeks	—	2.7	—	2.2
Over 2 weeks to 1 month	—	4.3	—	3.2
Over 1 month to 3 months	—	9.7	—	9.7
Three months or less	11.0	19.0	10.7	17.1
Over 3 months to 6 months	8.3	7.5	6.9	8.2
Over 6 months to 1 year	8.2	10.6	9.8	15.0
Over 1 year to 2 years	12.6	13.2	17.6	16.8
Over 2 years to 3 years	11.0	8.0	13.5	9.4
Over 3 years to 5 years	15.4	6.1	17.5	11.7
Over 5 years	33.5[1]	35.5	24.0[1]	21.7
Total	100.0	100.0	100.0	100.0

[1] Distributed as follows:

LENGTH-OF-SERVICE PERIOD	MALE		FEMALE	
Over 5 to 7 years	6,886	8.4	1,913	7.1
Over 7 to 10 years	8,265[a]	10.1	2,030[b]	7.6
Over 10 to 15 years	6,974	8.6	1,361	5.1
Over 15 to 20 years	2,388	2.9	501	1.9
Over 20 years	2,803	3.4	649	2.4
Total	27,316	33.5	6,454	24.0

[a] Includes 1 establishment with 328 males reported as having served "over 5 to 10 years."

[b] Includes 1 establishment with 655 females reported as having served "over 5 to 10 years."

The influence of the war period upon the length of service of males and females is brought out in Table 37. The figures are based upon the identical length of service distribution of the males and females in the active working forces of 30 establishments in 1914, and 28 establishments in 1918. It is evident that the proportion of short-service employees, both for males and females, is considerably greater in the war than in the pre-war period. In 1913–14 it appears that 27.5 per cent of the males and 27.4 per cent of the females of the active work force had service records of one year or less; the corresponding figures for the war period are 37.2 and 40.4 per cent, for males and females, respectively. The proportion of long-service employees in the active working force — and this applies to both males and females — decreased during the war period, as may be seen from the records of the number who had over one year's continuous service. In 1913–14 the figures show that 72.5 per cent of the males and 72.6 per cent of the females were in service for over one year. In 1917–18 the proportion of the males who served more than one year decreased to 62.8 per cent and the corresponding proportion of the females to 59.6 per cent.

The summarized figures of the length-of-service distribution of 28 establishments in 1917–18 classified by sex as shown in Table 36 are given in greater detail in Tables 38 *a* and 38 *b* which show, by industry groups, the length of service of active and separated male and female employees.

The figures presented in these tables show pronounced variations in the different industry groups in the proportion of male and female employees who had served given periods of time. This irregularity is apparent among both active and separating employees. It will be noted, however, that, in many cases, there are, within the same industry group, only slight differences in the proportions of males and females having identical length of service. Yet in certain service groups there are evident rather wide differences. Such discrepancies are noticeable in the over-five-years group, where male workers appear in much the larger proportions.

TABLE

LENGTH-OF-SERVICE DISTRIBUTION OF EMPLOYEES ON THE PAY ROLL [1917–18: 28

INDUSTRY GROUP	NUMBER OF ESTABLISHMENTS	NUMBER OF WORKERS [1]	PER CENT DISTRIBUTION OF			
			1 WEEK OR LESS	OVER 1 WEEK TO 2 WEEKS	OVER 2 WEEKS TO 1 MONTH	OVER 1 MONTH TO 3 MONTHS
Males						
Automobiles and parts mfg.	1	1,681	2	4	9	17
Chem. indust's and refineries	2	2,995	6	4	8	17
Clothing and textile mfg.	2	341	2	4	6	4
Furniture and millwork	1	1,607	3	3	6	9
Machinery mfg.	5	1,451	2	3	4	9
Mercantile establishments	4	13,100	3	5	4	9
Miscel. metal products mfg.	3	1,150	3	3	4	10
Printing and publishing	2	436	3	2	4	7
Public utilities:						
Gas and electricity	1	1,557	2	2	3	8
Street railways	1	3,718	1	2	4	11
Telephone service	6	5,339	1	1	2	5
Total	28	33,375	2	3	4	10
Females						
Automobiles and parts mfg.	1	212	—	7	14	21
Chem. indust's and refineries	2	445	4	5	9	20
Clothing and textile mfg.	2	481	5	7	7	10
Furniture and millwork	1	86	14	8	19	23
Machinery mfg.	5	311	—	9	11	23
Mercantile establishments	4	313	1	2	4	20
Miscel. metal products mfg.	3	1,278	8	10	15	11
Printing and publishing	2	504	2	1	2	5
Public utilities:						
Gas and electricity	1	284	5	4	5	17
Street railways	1	490	3	6	10	19
Telephone service	6	12,399	2	1	2	8
Total	28	16,803	2	2	3	10

[1] The figures in this column refer to the

38 *a*

AT THE END OF YEAR ("ACTIVE" EMPLOYEES), BY SEX AND INDUSTRY GROUPS
establishments]

"ACTIVE" EMPLOYEES WHO HAD SERVED CONTINUOUSLY:							INDUSTRY GROUP
OVER 3 MONTHS TO 6 MONTHS	OVER 6 MONTHS TO 1 YEAR	OVER 1 YEAR TO 2 YEARS	OVER 2 YEARS TO 3 YEARS	OVER 3 YEARS TO 5 YEARS	OVER 5 YEARS	TOTAL	
							Males
14	9	15	6	14	11	100	Automobiles and parts, mfg.
13	16	12	5	6	12	100	Chem. indus's and refin'r's
4	5	9	6	8	52	100	Clothing and textile mfg.
5	15	12	5	5	37	100	Furniture and millwork
5	9	15	11	4	39	100	Machinery mfg.
7	12	10	4	7	37	100	Mercantile establishments
7	15	15	9	8	25	100	Miscel. metal products mfg.
5	7	9	4	4	56	100	Printing and publishing
							Public utilities:
14	15	17	11	7	20	100	Gas and electricity
12	11	12	6	5	35	100	Street railways
4	8	10	7	10	53	100	Telephone service
8	11	13	8	6	36	100	Total
							Females
20	17	21	—	—	—	100	Automobiles and parts, mfg.
20	16	12	5	5	4	100	Chem. indust's and refiner's
7	8	9	10	12	25	100	Clothing and textile mfg.
10	15	5	3	1	1	100	Furniture and millwork
12	10	13	9	5	9	100	Machinery mfg.
11	19	13	6	9	14	100	Mercantile establishments
15	11	9	8	5	8	100	Miscel. metal products mfg.
7	6	15	10	9	43	100	Printing and publishing
							Public utilities:
11	18	17	7	6	10	100	Gas and electricity
15	12	12	5	4	14	100	Street railways
7	15	18	10	13	24	100	Telephone service
8	15	17	9	12	22	100	Total

aggregate number on pay rolls at end of year.

TABLE

LENGTH-OF-SERVICE DISTRIBUTION OF EMPLOYEES WHO LEFT DURING [1917–18:

INDUSTRY GROUP	NUMBER OF ESTABLISHMENTS	TOTAL NUMBER OF "SEPARATED" EMPLOYEES[1]	PER CENT DISTRIBUTION OF			
			1 WEEK OR LESS	OVER 1 WEEK TO 2 WEEKS	OVER 2 WEEKS TO 1 MONTH	OVER 1 MONTH TO 3 MONTHS
Males						
Automobiles and parts, mfg..	1	2,383	23	11	14	22
Chem. indust's and refineries	2	7,253	30	13	16	22
Clothing and textile mfg. .	2	444	11	9	17	17
Furniture and millwork . .	1	3,763	22	10	14	23
Machinery mfg.	5	3,472	15	9	10	19
Mercantile establishments .	4	10,755	19	9	12	22
Miscel. metal products mfg. .	3	1,886	22	18	14	19
Printing and publishing . .	2	459	20	5	13	13
Public utilities:						
Gas and electricity . .	1	834	5	3	14	23
Street railways . . .	1	3,430	7	7	13	25
Telephone service . .	6	7,007	13	8	14	23
Total	28	41,686	18	10	13	21
Females						
Automobiles and parts, mfg..	1	151	30	7	13	23
Chem. indust's and refineries	2	747	22	11	10	25
Clothing and textile mfg. .	2	903	16	13	13	19
Furniture and millwork . .	1	267	23	8	18	27
Machinery mfg.	5	370	31	10	10	16
Mercantile establishments .	4	334	10	10	19	26
Miscel. metal products mfg. .	3	1,544	22	10	10	29
Printing and publishing . .	2	471	16	4	10	15
Public utilities:						
Gas and electricity . .	1	206	6	3	9	21
Street railways . . .	1	298	14	9	13	21
Telephone service . .	6	9,080	14	6	5	16
Total	28	14,371	15	7	8	19

[1] The figures in this column refer to the aggregate number in each

38 *b*

THE YEAR ("SEPARATING EMPLOYEES") BY SEX AND INDUSTRY GROUP
28 establishments]

"SEPARATING" EMPLOYEES WHO HAD SERVED CONTINUOUSLY:—							INDUSTRY GROUP
OVER 3 MONTHS TO 6 MONTHS	OVER 6 MONTHS TO 1 YEAR	OVER 1 YEAR TO 2 YEARS	OVER 2 YEARS TO 3 YEARS	OVER 3 YEARS TO 5 YEARS	OVER 5 YEARS	TOTAL	
							Males
12	9	4	2	4	—	100	Automobiles and parts, mfg.
9	6	2	(*a*)	1	1	100	Chem. indust's and refiner's
14	8	6	6	3	9	100	Clothing and textile mfg.
12	8	4	1	1	4	100	Furniture and millwork
13	12	13	2	2	5	100	Machinery mfg.
12	10	6	2	3	4	100	Mercantile establishments
13	8	4	1	1	1	100	Miscel. metal products mfg.
10	10	6	5	7	12	100	Printing and publishing
							Public utilities:
13	15	12	5	5	5	100	Gas and electricity
17	13	8	2	3	5	100	Street railways
15	10	7	2	4	4	100	Telephone service
13	10	7	2	2	4	100	Total
							Females
15	10	1	—	—	—	100	Automobiles and parts, mfg.
17	8	3	1	2	1	100	Chem. indust's and refiner's
10	14	5	4	3	2	100	Clothing and textile mfg.
16	7	1	—	—	—	100	Furniture and millwork
9	7	14	1	1	—	100	Machinery mfg.
13	11	5	2	3	3	100	Mercantile establishments
14	5	6	2	1	1	100	Miscel. metal products mfg.
10	10	12	7	5	11	100	Printing and publishing
							Public utilities:
22	12	12	4	6	5	100	Gas and electricity
16	11	4	2	3	6	100	Street railways
13	14	11	4	8	8	100	Telephone service
13	13	9	4	6	6	100	Total

group who left during the year. *a* Less than 0.5 per cent.

LENGTH OF SERVICE OF SKILLED AND UNSKILLED

The relation between the degree of skill and the length of service of both active and separated employees was made the subject of a special inquiry reporting the experience of 17 establishments covering the years 1913, 1914 and 1915. The results are shown in Table 39.

TABLE 39

LENGTH-OF-SERVICE DISTRIBUTION OF "ACTIVE EMPLOYEES" (I.E., THOSE ON PAY ROLL AT END OF YEAR) AND OF EMPLOYEES WHO LEFT DURING THE YEAR ("SEPARATED EMPLOYEES"), CLASSIFIED ACCORDING TO SKILL, 1913–1915

LENGTH-OF-SERVICE GROUP	EMPLOYEES ON PAY ROLL AT END OF YEAR (ACTIVE EMPLOYEES) WHO HAD WORKED CONTINUOUSLY SPECIFIED PERIODS		SEPARATED EMPLOYEES WHO HAD SERVED CONTINUOUSLY FOR SPECIFIED PERIODS	
	SKILLED	UNSKILLED	SKILLED	UNSKILLED
	NUMBER			
3 months or less	2,169	4,442	7,072	11,145
Over 3 to 6 months	1,449	2,102	2,218	2,875
Over 6 months to 1 year	1,523	1,518	1,869	2,065
Over 1 to 2 years	2,921	2,265	932	1,211
Over 2 to 3 years	2,286	2,297	640	545
Over 3 to 5 years	3,011	2,560	412	400
Over 5 years	6,675	3,015	536	308
Total	20,034	18,199	13,679	18,549
	PER CENT DISTRIBUTION			
3 months or less	10.8	24.4	51.7	60.1
Over 3 to 6 months	7.2	11.6	16.3	15.5
Over 6 months to 1 year	7.6	8.3	13.7	11.1
Over 1 to 2 years	14.6	12.4	6.8	6.5
Over 2 to 3 years	11.4	12.6	4.7	2.9
Over 3 to 5 years	15.0	14.1	3.0	2.2
Over 5 years	33.3	16.6	3.9	1.7
Total	100.0	100.0	100.0	100.0

The figures indicate that only about one-tenth of the skilled employees on the pay roll, but nearly one-fourth of the unskilled,

had served as short a time as three months or less. The proportions of the skilled and unskilled active employees who had served from one to five years are about the same; in the over-five-years service group of active employees there is a considerable difference, however, the proportion of skilled in that group being 33.3 per cent, whereas the proportion of unskilled is only 16.6 per cent. Among the separated employees it is only in the long service groups that there is any decided difference in the relative proportions of skilled and unskilled employees, the unskilled separating employees showing a slightly higher percentage in the length-of-service groups of one year or less, the figures being 81.7 per cent for skilled and 86.7 per cent for unskilled. In the over-one-to-five-year groups the proportion of separated skilled employees is 14.5 per cent, and that of the unskilled 11.6 per cent; in the over-five-years group the skilled represented 3.9 per cent and the unskilled 1.7 per cent of the total separations.[1]

In the discussion of the relative mobility of the skilled and unskilled workers, attention has been directed to the fact that there was more frequent shifting among the unskilled workers generally, as compared with the skilled, and that this shifting of the unskilled has taken on enormous proportions during later years.[2] The mobility records of individual workmen are of no little interest in this connection. In 1914, Mr. P. A. Speek, an investigator for the Commission on Industrial Relations, made a very thorough and painstaking first-hand study of the unskilled migratory worker. In his report to the Commission, Mr. Speek includes as an appendix the "copies of record cards of 7 typical floating laborers applying at the State Free Employment Office, Milwaukee, Wisconsin (in the period 1911–1913), showing the number and nature of jobs during certain periods of time." These records show in chronological order the nature of the various jobs held, with the dates on which the laborers were sent to those jobs. A summary of the records follows:

[1] See also Tables 19, 24, and 49.

[2] See Table 19.

1. Patrick J. Flynn, 87 jobs during 23 months and 6 days, or one job in every 8 days.
2. Jos. Stein, 7 jobs during 5 months and 4 days, or one job in every 22 days.
3. Frank O'Neill, 16 jobs during 7 months and 10 days, or one job in every 14 days.
4. Matt Brewer, 20 jobs during 10 months and 19 days, or one job in every 16 days.
5. Chas. Sommer, 72 jobs during 10 months and 19 days, or one job in every 4½ days.
6. Fred Miller, 59 jobs during 6 months and 8 days, or one job in every 3½ days.
7. William Thompson, 34 jobs during 12 months and 14 days, or one job in every 11 days.[1]

A very interesting side-light upon the shifting of common laborers during the war period and the duration of their employment on different jobs is furnished by the record of one of the large printing establishments in the Middle West shown in Table 40, on page 135.

For a period of three months this firm kept a record of the length of service of unskilled male laborers who left their employ. Besides recording the length of time jobs have been held, the age, wage rate received, and finally, the reason for leaving of each individual worker, are also given. The period under consideration marks one of enormous expansion in industrial activity, and the competition for labor, especially for common labor, was exceedingly keen during the period under observation. The influence of these factors upon the situation is very clearly reflected in the data shown in this table. Of the 78 individual laborers listed 37 worked less than a week, 11 worked a full week, 10 worked between 10 days and 3 weeks, and only 20 worked more than a month before they quit. It does not appear that either the age or wage rate influenced stability to any appreciable extent one way or another. Men of all age groups and of both

[1] P. A. Speek, "Report on Floating Laborers" (Typewritten manuscript report to the Commission), Appendix ii, pp. 84–91.

TABLE 40

LENGTH-OF-SERVICE RECORDS OF 78 UNSKILLED MALE LABORERS HIRED ON OR SINCE JULY 1, 1918, BUT NOT ON PAY ROLL OCTOBER, 1918, IN A PRINTING CONCERN. (ESTABLISHMENT NO. 151.)

EMPLOYEE NUMBER	AGE	RATE PER HOUR	HOW LONG EMPLOYED	REASON FOR LEAVING
1	23	.30	Two Hours	Failed to report.
2	20	.25	Half a Day	No reason.
3	21	.30	One Day	No reason.
4	19	.30	One Day	Work too hot.
5	21	.30	One Day	Too hard.
6	19	.30	One Day	Work too hard.
7	17	.30	One Day	Failed to report.
8	18	.27	One Day	Cannot stand the heat.
9	18	.24	One Day	Another position.
10	18	.25	One Day	No reason.
11	69	.29	One Day	Work too heavy.
12	19	.25	One Day	No reason.
13	19	.27	One Day	Cannot stand the heat
14	19	.30	One Day	No reason.
15	49	.30	One Day	Too hard.
16	18	.25	One Day	No reason.
17	18	.27	One Day	Another position.
18	18	.30	One Day	No reason.
19	17	.18	One Day	Failed to report.
20	18	.30	One Day	Cannot stand heat.
21	19	.30	One Day	Too hot.
22	50	.27	One Day	Failed to report.
23	18	.27	One Day	Cannot stand the heat.
24	29	.30	One Day	No reason.
25	18	.30	One Day	No good.
26	18	.27	Two Days	Failed to report
27	19	.27	Two Days	No reason.
28	16	.16	Two Days	No reason.
29	18	.30	Two Days	Failed to report
30	17	.30	Two Days	Back to the country.
31	17	.27	Three Days	Work too hot.
32	18	.25	Three Days	No reason.
33	18	.30	Four Days	Too lazy.
34	41	.27	Four Days	Failed to report.
35	38	.30	Four Days	Too hard.
36	18	.25	Five Days	No reason.
37	18	.25	Five Days	No reason.
38	18	.25	One Week	No reason.
39	26	.30	One Week	Work too hard.
40	31	.20	One Week	Did not want to work. No good.
41	17	.30	One Week	No good.
42	26	.30	One Week	Too lazy.
43	16	.16	One Week	Discharged.
44	35	.30	One Week	No reason.
45	18	.27	One Week	No reason.

TABLE 40 — *Continued*

LENGTH-OF-SERVICE RECORDS OF 78 UNSKILLED MALE LABORERS HIRED ON OR SINCE JULY 1, 1918, BUT NOT ON PAY ROLL OCTOBER, 1918, IN A PRINTING CONCERN. (ESTABLISHMENT NO. 151.)

EMPLOYEE NUMBER	AGE	RATE PER HOUR	HOW LONG EMPLOYED	REASON FOR LEAVING
46	36	.30	One Week	Ordered to look for essential work.
47	16	.23	One Week	No reason.
48	20	.24	One Week	No reason.
49	35	.30	Ten Days	Too hard.
50	16	.18	Two Weeks	Failed to report.
51	18	.25	Two Weeks	No good.
52	16	.16	Two Weeks	No reason.
53	18	.27	Two Weeks	Better paying job.
54	52	.32	Two Weeks	Another position.
55	21	.27	Two Weeks	No reason.
56	56	.30	Three Weeks	No reason.
57	16	.22	Three Weeks	No reason.
58	23	.27	Three Weeks	Another position.
59	17	.25	One Month	No reason.
60	21	.27	One Month	No reason.
61	19	.27	One Month	Another job.
62	51	.30	One Month	No reason.
63	18	.30	One Month	Better job.
64	38	.32	One Month	Drunk.
65	43	.29	One Month	Another job.
66	17	.27	One Month	Work too hot for him.
67	33	.29	One Month	Discharged.
68	18	.30	One Month	Better job.
69	40	.33	One Month	No reason.
70	16	.18	Six Weeks	No reason.
71	48	.30	Six Weeks	No reason.
72	22	.29	Six Weeks	Left city.
73	49	.27	Two Months	Has better paying job.
74	16	.18	Two Months	Better job.
75	18	.26	Two Months	No reason.
76	43	.30	Two Months	Wanted more money.
77	33	.30	Three Months	No reason.
78	47	.29	Three Months	No reason.

higher and lower hourly wage rates are found among those employees who served only a few days as well as among those who had served longer periods. Half of the workers listed left without giving any reason or giving any notice of their intention to leave. A large proportion left because they found the work either too hot or too hard; only a few of those who quit indicated that they had other jobs in view.

LENGTH OF SERVICE IN DIFFERENT PLANT DEPARTMENTS

Just as the labor instability is not distributed in equal degree among the different sections of the work force, so the length of service of the active employees as well as the employees leaving differs widely in different sections of the work force. This is well illustrated in Table 41.

TABLE 41

LENGTH-OF-SERVICE DISTRIBUTION OF "ACTIVE EMPLOYEES" (I.E., THOSE ON PAY ROLL AT END OF YEAR), AND OF EMPLOYEES WHO LEFT DURING THE YEAR ("SEPARATED EMPLOYEES"), IN A MEN'S CLOTHING-MANUFACTURING PLANT (ESTABLISHMENT NO. 103), 1917–18

LENGTH-OF-SERVICE GROUP	EMPLOYEES ON PAY ROLL AT END OF YEAR (ACTIVE) IN —			EMPLOYEES SEPARATED DURING THE YEAR IN —		
	GENERAL DEPARTMENT (CLERICAL ETC.)	TAILORING DEPARTMENT	CUTTING AND TRIMMING DEPARTMENT	GENERAL DEPARTMENT (CLERICAL ETC.)	TAILORING DEPARTMENT	CUTTING AND TRIMMING DEPARTMENT
	NUMBER					
1 week or less	5	4	8	144	855	106
Over 1 week to 2 weeks	11	34	7	106	475	114
Over 2 weeks to 1 month	63	115	5	150	521	165
Over 1 month to 3 months	108	205	12	327	993	212
Over 3 months to 6 months	64	472	40	247	438	125
Over 6 months to 1 year	136	376	13	207	402	127
Over 1 year to 2 years	144	698	55	143	511	48
Over 2 years to 3 years	92	596	24	43	154	24
Over 3 years to 5 years	84	610	36	52	323	27
Over 5 years	208	1,029	295	45	150	6
Total	915	4,139	495	1,464	4,822	954
	PER CENT					
1 week or less	.5	.1	1.6	9.8	17.7	11.1
Over 1 week to 2 weeks	1.2	.8	1.4	7.2	9.6	11.9
Over 2 weeks to 1 month	6.9	2.8	1.0	10.2	10.8	17.3
Over 1 month to 3 months	11.8	5.0	2.4	22.3	20.6	22.2
Over 3 months to 6 months	7.0	11.4	8.1	16.9	9.1	13.1
Over 6 months to 1 year	14.9	9.1	2.6	14.1	8.3	13.3
Over 1 year to 2 years	15.7	16.9	11.1	9.8	10.6	.50
Over 2 years to 3 years	10.1	14.4	4.8	2.9	3.2	2.5
Over 3 years to 5 years	9.2	14.7	7.3	3.6	6.7	2.8
Over 5 years	22.7	24.9	59.6	3.1	3.1	.6
Total	100.0	100.0	100.0	100.0	100.0	100.0

The proportion of short-service employees in the active working force is greatest in the "general" department — where 20.4 per cent of those in service at that time had served 3 months or less. In the tailoring department the corresponding length-of-service group has 9 per cent, and in the cutting and trimming departments 6 per cent, of the employees on the pay roll. This firm, known for its liberality in dealing with labor, is able to show a proportion of long-service groups well above that of the ordinary run of establishments. The proportion of employees with service records of over one year is 57.7 per cent, 70.9 per cent and 82.8 per cent, respectively, in the three departments named. Turning to the separating employees, it is evident that the cutting and trimming department lost fewer of its old-time employees than the other two groups, although a good deal of shifting also took place in these latter departments, as is indicated by the large proportion of employees who left employment after short periods of service.

AVERAGE WEEKLY SERVICE RATES

It is a matter of course that as the period of service increases the number of employees who have served such period decreases — and decreases usually at a progressively increasing rate. This naturally holds true for both active and separating groups of employees. The length-of-service figures presented in the preceding pages do not reveal this tendency, for the reason that the length-of-service records were not tabulated on a scale made up of equal intervals of time. In Table 34, for example, it appears that nearly as many separated employees had service records falling within a range of from one to seven days as had service records of from one to three months — in which group the range is about nine times as great. This statement of the situation is true, but misleading. The really significant difference is that between the number of quitters who had worked one week or less and the average weekly number of quitters into which the total number who had worked from one to three

months is distributed. The comparison should be between weekly averages of active and separated employees in the different tenure groups. In other words, the important thing to know is not so much the number leaving who had one to three months' service records as the number of quitters assignable on the average to each of the nine weeks of the one to three months' period — what may for the sake of brevity be called the average weekly number leaving (or working on the active force) in each classified service period.

LENGTH OF SERVICE AND TYPE OF SEPARATION[1]

This "weekly average" is made the basis of Table 42 which shows the number, per cent distribution, and corrected (i.e., weekly average) separation service rates per full-year worker, of employees quitting voluntarily, laid off, and discharged from 30 establishments reporting for the pre-war period.[2]

In this table the declining scales of corrected rates indicate much more accurately than do the unsubdivided figures the relative importance of long and short time employees as factors in the turnover situation. Relatively high average weekly (i.e., corrected) separation rates, particularly in the shorter time periods, indicate relatively low stability — that is to say, high turnover. Thus it is evident from the corrected separation rates of Table 42 that in every service period the frequency of quitting voluntarily is from 3 to 7 times as rapid as the frequency of lay-off separation and from 2 to 5 times as rapid as the frequency of discharge. For all three types of separation by far the heaviest responsibility falls on the under-3-months group in which employees leave, whatever the circumstances of their separation, 4 and 5 times as rapidly as they do in the 3-to-6-months group. In the latter group, in turn, they leave almost twice as rapidly as in the 6-to-9-months group; taking the extreme ends of

[1] See Chapter VI for discussion of type of separation without reference to length of service.

[2] See footnote 1 to Table 42, page 140.

TABLE 42

NUMBER, PER CENT DISTRIBUTION, AND CORRECTED SEPARATION SERVICE RATES OF EMPLOYEES QUITTING, LAID OFF, AND DISCHARGED DURING ONE YEAR

(30 establishments, 1913, 1914, or 1915)

TYPE OF SEPARATION	EMPLOYEES LEAVING IN THE MANNER INDICATED, WHO HAD WORKED CONTINUOUSLY:								
	3 MONTHS OR LESS	OVER 3 TO 6 MONTHS	OVER 6 TO 9 MONTHS	OVER 9 MONTHS TO 1 YEAR	OVER 1 TO 2 YEARS	OVER 2 TO 3 YEARS	OVER 3 TO 5 YEARS	OVER 5 YEARS	TOTAL
	NUMBER								
Quit	17,809	4,069	2,224	1,391	2,541	1,270	1,038	1,045	31,387
Lay off	4,176	1,111	780	344	551	258	156	154	7,530
Discharge	7,606	1,474	830	511	899	378	312	261	12,271
Total	29,591	6,654	3,834	2,246	3,991	1,906	1,506	1,460	51,188
	PER CENT DISTRIBUTION IN EACH SERVICE GROUP								
Quit	60	61	58	62	64	67	69	72	61
Lay off	14	17	20	15	14	14	10	11	15
Discharge	26	22	22	23	23	20	21	18	24
Total	100	100	100	100	100	100	100	100	100
	CORRECTED SEPARATION SERVICE RATES PER FULL-YEAR WORKER [1]								
Quit	.295	.067	.037	.023	.011	.006	.002	—	.519
Lay off	.069	.018	.013	.006	.002	.001	(2)	—	.125
Discharge	.126	.024	.014	.008	.004	.002	.001	—	.203
Total	.490	.109	.064	.037	.017	.009	.003	—	.847

[1] Based on the 181,419,000 labor hours put in during one year by employees of 30 establishments and corrected for inequality of time periods by dividing the crude rates in each group by the number of quarterly periods in it, as follows:

3 months or less	1	Over 1 to 2 years	4
Over 3 months to 6 months	1	Over 2 to 3 years	4
Over 6 to 9 months	1	Over 3 to 5 years	8
Over 9 months to 1 year	1		

[2] Less than .0005.

the service scale it appears that employees leave voluntarily and are laid off or discharged at least one hundred times as rapidly from the under-3-months as they are from the 3-to-5-years group. The percentage distribution figures indicate that in each service group, quits, lay-offs, and discharges make up roughly the same proportion of the total separations assignable to each service group, quits ranging from 58 to 72 per cent, lay-offs from 10 to 20 per cent, and discharges from 18 to 26 per cent.

CHAPTER IX

Stable and Unstable Employees

In the discussion of the figures on the length of service of the active working force attention has been called to the fact that in each establishment at a given time there will, of course, be found a certain proportion of long-service employees. No matter what divisions of the working force may be considered — shifts, departments, the skilled and unskilled, distinct occupations, etc. and whatever the prevailing factors may be that influence the rate of labor mobility of these groups — they all will be found to contain elements of stability. Inordinate shifting of labor is characteristic only of certain parts of the working force. This of course, does not mean that senior employees do not sooner or later also change their employment and that they are not to be reckoned at all as a factor in labor mobility. But in each establishment at a given time will be found a nucleus of workers who have become a part of the permanent working force, who have grown up in the establishment, as it were, and who are for various reasons less desirous of change. The fact that it is only a portion of the working force which becomes a factor in the labor mobility over a given period shows that there is more or less concentration in the mobility of the plant force, and for that reason the rates of mobility as applied to the working force as a whole do not correctly assign the direct responsibility for the labor flux. It is evident that the rates of mobility would be the same if the whole working force changes completely once in the course of a year, or, if one-half of the work force changes two times, or, one-fourth of the work force changes four times, in the course of a year, and so on. In the presentation of the figures that follow an attempt is made to establish a more simple and direct connection between length of service and labor mobility.

The detailed period-of-service figures of active employees in the industry groups shown in Table 35 in seven length-of-service divisions, have been condensed in Table 43 into just two divisions; those who have served continuously for periods up to one year and those who have continuous service records of over one year. The same figures are shown graphically in Chart I.

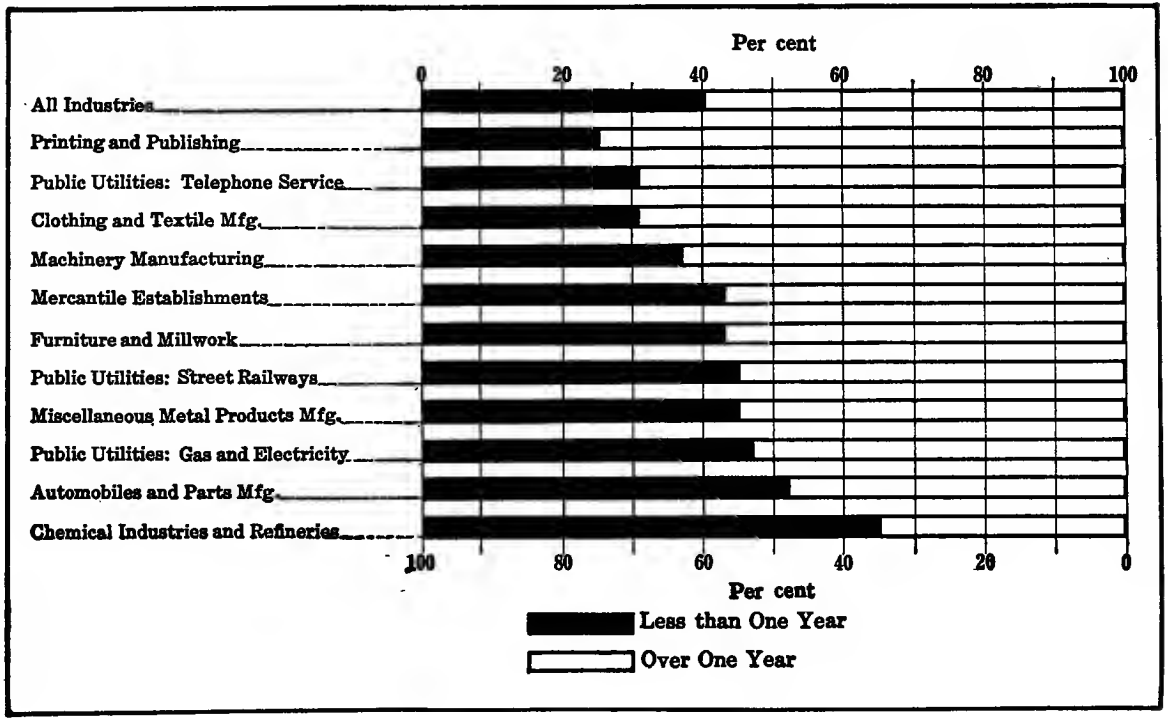
TABLE 43

NUMBER AND PER CENT DISTRIBUTION OF "ACTIVE EMPLOYEES" WHO HAD SERVED ONE YEAR OR LESS AND OVER ONE YEAR, RESPECTIVELY, IN SPECIFIED INDUSTRY GROUPS, 1917–18. (53 ESTABLISHMENTS)

INDUSTRY GROUP	NUMBER		PER CENT	
	ONE YEAR OR LESS	OVER ONE YEAR	ONE YEAR OR LESS	OVER ONE YEAR
Automobiles and parts manufacturing	4,429	4,086	52.0	48.0
Chemical industries and refineries	2,513	1,335	65.0	35.0
Clothing and textile manufacturing	1,972	4,399	31.0	69.0
Furniture and millwork	729	964	43.0	57.0
Machinery manufacturing	6,760	11,504	37.0	63.0
Mercantile establishments	625	826	43.0	57.0
Miscellaneous metal products mfg.	2,750	3,410	45.0	55.0
Printing and publishing	231	709	25.0	75.0
Public utilties: Gas and electricity	864	977	47.0	53.0
Street railways	1,908	2,300	45.0	55.0
Telephone service	5,667	12,811	31.0	69.0
Total	28,448	43,321	40.0	60.0

It is at once evident that of 71,769 persons on the pay rolls of the 53 establishments on June 1, 1918, 43,321 or 60 per cent had been in continuous service over one year. These long-service employees were in no way responsible for the labor mobility of these establishments for the 12-month period ending with that date. The proportion of employees who were free from responsibility for the labor shifting depends upon the proportion of long-service employees in the working force, which, as may be seen, varies considerably between the industry groups shown, the highest percentage of employees having service records of over

CHART I. PROPORTION OF "ACTIVE" EMPLOYEES WHO HAD SERVED ONE YEAR OR LESS AND OVER ONE YEAR, RESPECTIVELY; BY INDUSTRY GROUPS



one year being in printing and publishing. Generally, the proportion of over-one-year active-service employees is greater than the proportion of active employees who have worked less than one year. There are two exceptions among the industry groups: automobiles and parts manufacturing and chemical industries and refineries. In these two groups the proportion of active employees with service periods of less than one year is greater than those with over one year's service.

Knowing the number of employees with service records at least as long or longer than the period for which the labor mobility is reported, the responsibility of that part of the working force which has actually occasioned the labor instability can be definitely established, and in Table 44 the base upon which the rate of mobility is measured is that part of the work force which directly contributed to it. The rate figures given in the table are plotted on Chart J on page 148. The table and graph show the responsibility for labor mobility of the stable and unstable employees, respectively.[1]

It will be observed that in these 53 establishments with a working force of 69,553 there were at the end of the year 43,321 employees, representing 62 per cent of those on the pay roll, with a service record of over one year. These employees were not responsible for any of the labor changes that took place during the year. The labor mobility is thus concentrated on 26,232 workers or 38 per cent of the total work force. This relatively small part of the work force was responsible for the labor changes which took place during the year, involving 93,206 accessions and 96,207 separations, a labor flux of 189,413 persons. This means that for every worker on the unstable work force more than 3 persons were hired and nearly 4 persons left employment, involving altogether more than 7 labor changes for each worker. A comparison of the labor mobility of the stable and unstable working force shows the labor mobility rates based

[1] For detailed figures regarding stable and unstable employees in individual establishments see Table C in the Appendix.

TABLE

COMPARISON OF LABOR MOBILITY RATES BASED ON THE TOTAL WORKING FORCE INDUSTRY GROUPS, YEAR

INDUSTRY GROUP	NUMBER OF ESTABLISHMENTS	TOTAL WORKING FORCE[1]	UNSTABLE PART OF WORKING FORCE	PER CENT UNSTABLE PART OF WORKING FORCE IS OF TOTAL WORKING FORCE
Automobiles and parts	5	8,773	4,687	53
Chemical industries and refineries	3	3,290	1,955	59
Clothing and textile mfg.	3	6,837	2,438	36
Furniture and millwork	1	1,514	550	36
Machinery mfg.	13	17,047	5,543	33
Mercantile establishments	3	1,371	545	40
Miscellaneous metal products mfg.	13	6,732	3,322	49
Printing and publishing	2	1,011	302	30
Public utilities: Gas and electricity	1	1,933	956	49
Street railways	1	3,643	1,343	37
Telephone service	8	17,403	4,591	26
Total	53	69,553	26,232	38

	RATE OF CHANGE PER FULL-YEAR WORKER (BASED ON TOTAL WORKING FORCE)[2]		
	ACCESSION	SEPARATION	FLUX
Automobiles and parts	1.44	1.53	2.97
Chemical industries and refineries	3.27	2.97	6.24
Clothing and textile mfg.	.99	1.26	2.25
Furniture and millwork	2.25	3.03	5.28
Machinery mfg.	1.23	1.11	2.34
Mercantile establishments	1.41	1.35	2.76
Miscellaneous metal products	2.34	2.28	4.62
Printing and publishing	.75	.93	1.68
Public utilities: Gas and electricity	.81	.54	1.35
Street railways	.84	1.02	1.86
Telephone service	.90	1.05	1.95
Average	1.35	1.38	2.73

[1] This number is 2216 less than the number on the pay roll of the 53 establishments at the end service having been reduced to equivalent full year, or 3000 hour, workers.

[2] Represents ratio of labor changes (accessions, separations and flux) to labor hours of total working

[3] Represents ratio of labor changes (accessions, separations and flux) to labor hours of unstable part of the working force.

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WITH RATES BASED ON THE UNSTABLE PART OF THE WORKING FORCE IN SPECIFIED ENDING MAY 31, 1918

Labor Hours Worked By:—		Labor Changes			Industry Group
Total Working Force (Thousands)	Unstable Part of Working Force (Thousands)	Accessions	Separations	Total (Flux)	
26,319	14,061	12,659	13,490	26,149	Automobiles and parts
9,870	5,865	10,743	9,780	20,523	Chem. industries and refineries
20,511	7,314	6,771	8,587	15,358	Clothing and textile mfg.
4,542	1,650	3,410	4,566	7,976	Furniture and millwork
51,141	16,629	20,881	18,686	39,567	Machinery mfg.
4,113	1,635	1,931	1,862	3,793	Mercantile establishments
20,196	9,966	15,803	15,403	31,206	Miscellaneous metal products mfg.
3,033	906	749	930	1,679	Printing and publishing
5,799	2,868	1,585	1,040	2,625	Public utilities: Gas and electricity
10,929	4,029	3,058	3,728	6,786	Street railways
52,206	13,773	15,616	18,135	33,751	Telephone service
208,659	78,696	93,206	96,207	189,413	Total

Rate of Change per Full-year Worker (Based on Unstable Part of Working Force)[3]			
Accession	Separation	Flux	
2.70	2.88	5.58	Automobiles and parts
5.49	5.01	10.50	Chemical industries and refineries
2.79	3.51	6.30	Clothing and textile mfg.
6.21	8.31	14.52	Furniture and millwork
3.78	3.36	7.14	Machinery mfg.
3.54	3.42	6.96	Mercantile establishments
4.77	4.65	9.42	Miscellaneous metal products
2.49	3.09	5.58	Printing and publishing
1.65	1.08	2.73	Public utilities: Gas and electricity
2.28	2.79	5.07	Street railways
3.39	3.96	7.35	Telephone service
3.54	3.66	7.20	Average

of May, 1918, shown in Table 34, the labor time of the employees with less than one year's continuous

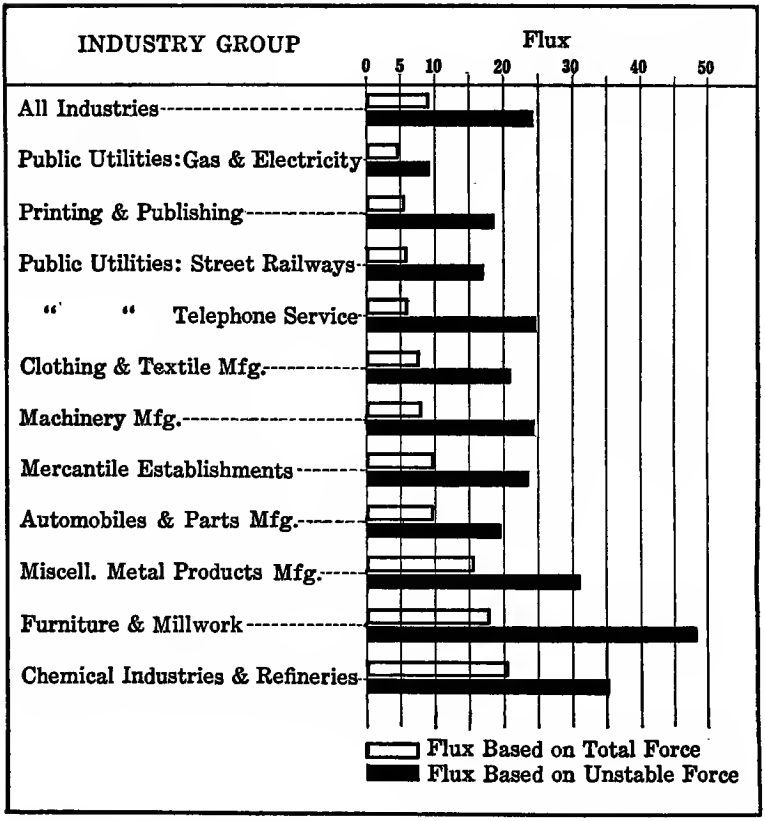
force, or, in other words, to the equivalent number of full-year workers in the total working force.

part of working force, or, in other words, to the equivalent number of full-time workers in the unstable

on the labor hours of the unstable part of the work force to be nearly three times as great as the labor-change rates based on

CHART J. COMPARISON OF LABOR FLUX RATES BASED ON THE TOTAL WORK FORCE WITH RATES BASED ON THE UNSTABLE PART OF THE WORK FORCE, BY INDUSTRY GROUPS

(Unit: One labor change per full-year worker.)



the labor hours of the whole working force. The extent of the direct responsibility for the labor changes within the work force varies considerably among the different industry groups shown, such responsibility being dependent, of course, upon the

proportion of long-service employees in the different establishments.

The importance of employees of long tenure as a factor in labor stability and their influence upon labor mobility rates is well illustrated by the mobility figures for the telephone service group. At the termination of the mobility census it appeared that 74 per cent of the employees had been in service more than a year, thus concentrating the labor mobility upon 26 per cent of the total work force. The labor change rates in the telephone service as applied to the total working force are .90, 1.05 and 1.95 for accession, separation, and flux, respectively, but the number of labor shiftings when applied to that part of the working force to which the turnover is actually attributable show corresponding rates of 3.39, 3.96 and 7.35. This clearly indicates relatively low labor mobility for the working force as a whole in the telephone service, reveals a concentration of whatever labor mobility there has been upon a comparatively small portion of the plant forces and shows very frequent changes within the personnel of the unstable labor group.

In general, it may be observed that in those industry groups which have a comparatively low percentage of unstable employees and also a relatively low mobility rate as based upon the total working force, the difference between the mobility rate based on the total working force and the rate based on the unstable working force is also considerably greater than in industry groups in which a larger proportion of the working force is responsible for the mobility. The explanation for this is that in those industry groups which show a low percentage of unstable employees only a comparatively small part of the work force is responsible for the labor changes, and the labor forces of these industry groups contain a large number of senior employees who are not at all responsible for the flux. These establishments for that reason are able to show a comparatively low mobility rate when based on the entire working force. In establishments showing a higher percentage of unstable employees the responsibility for

the labor shifting is more evenly distributed in the working force, and differences in the mobility rates between the stable and unstable working force are, therefore, correspondingly lower. For example, the unstable working force in the telephone service group is relatively small — 26 per cent; the difference in the flux rates between the stable and unstable working force is 5.40. In the automobiles-and-parts group the unstable working force is comparatively large — 53 per cent — and the difference in the flux rate of the two divisions of the work force is only 2.61.

Because of the great variations in the mobility rates of the individual establishments constituting any particular industrial group, some summary figures classifying the labor flux rates of the stable and unstable working force of the 53 individual establishments covered in the preceding table are given below.

TABLE 45

NUMBER OF ESTABLISHMENTS HAVING CLASSIFIED LABOR FLUX RATES BASED (1) ON THE WHOLE WORKING FORCE AND (2) ON THE UNSTABLE PART OF WORKING FORCE, YEAR ENDING MAY 31, 1918. (53 ESTABLISHMENTS)

CLASSIFIED FLUX RATE	NUMBER OF ESTABLISHMENTS HAVING CLASSIFIED LABOR FLUX RATES PER FULL-YEAR WORKER, BASED ON	
	TOTAL WORKING FORCE	UNSTABLE WORKING FORCE
FLUX RATE: ALL ESTABLISHMENTS.....	2.7	7.2
1.20 and under	1	—
Over 1.2 to 2.4	14	—
Over 2.4 to 3.6	18	2
Over 3.6 to 4.8	6	4
Over 4.8 to 6.0	8	9
Over 6.0 to 7.2	4	13
Over 7.2 to 8.4	2	6
Over 8.4 to 9.6	—	6
Over 9.6 to 10.8	—	5
Over 10.8 to 12.0	—	2
Over 12.0 to 13.2	—	1
Over 13.2 to 14.4	—	3
Over 14.4 to 15.6	—	2
Total	53	53

The great range of variation in the flux rates of the unstable working forces of the 53 individual establishments (the combined rate for which is 7.2) may be gauged from the fact that the unstable-work-force flux rate in two establishments falls so low as to come within the flux-rate group of over 2.4 to 3.6 (about two changes for each worker in the unstable work force), while there are two concerns the flux rate of which is classified in the flux-rate group of over 14.4 to 15.6 (about 15 labor changes for every employee in the unstable work force). An even more striking presentation of the comparative instability of stable and unstable employees is made in Table 46. In it the data relating to the labor mobility of the individual establishments are grouped according to the relative proportions of their unstable employees to the total working force.

These figures bring out in a very graphic manner the fact to which reference has been made above; namely, that as the proportion of the unstable working force increases, thus showing the responsibility for the labor changes to be more largely distributed among the whole working force, the labor mobility rates also show a decided tendency to increase. The margin, however, between the labor change rates of the whole work force and those of the unstable working force is decidedly less as the proportion of the unstable portion of the working force to the total working forces increases. A comparison of the flux rates of the two divisions of the working force shows this margin to be as follows: when the proportion of unstable working force to total working force is 20 per cent or less, the flux rate margin is 6.63; when it is over 20 to 40 per cent, the margin is 4.26; when it is over 40 to 60 per cent, the margin is 3.96; and when it is over 60 per cent, the margin is 1.92.

TABLE

COMPARISON OF LABOR MOBILITY RATES BASED ON THE TOTAL WORKING FORCE, CLASSIFIED ACCORDING TO THE RELATIVE SIZE OF

ESTABLISHMENTS IN WHICH PROPORTIONS OF UNSTABLE WORKING FORCE TO TOTAL WORKING FORCE WERE —	NUMBER OF ESTABLISHMENTS	TOTAL WORKING FORCE	UNSTABLE PART OF WORKING FORCE	LABOR HOURS: TOTAL WORKING FORCE (THOUSANDS)
20 per cent or less	4	18,389	3,407	55,167
Over 20 to 40 per cent	17	29,281	10,181	87,843
Over 40 to 60 per cent	22	14,624	7,406	43,872
Over 60 per cent	10	7,253	5,238	21,777
Total	53	69,553	26,232	208,659

	RATE PER FULL-YEAR WORKER, BASED ON TOTAL WORKING FORCE		
	ACCESSION	SEPARATION	FLUX
20 per cent or less	.69	.81	1.50
Over 20 to 40 per cent	1.08	1.14	2.22
Over 40 to 60 per cent	2.10	1.95	4.05
Over 60 per cent	2.43	2.61	5.04
Total	1.35	1.38	2.73

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FORCE WITH RATES BASED ON THE UNSTABLE PART OF THE WORKING THE UNSTABLE PART OF THE WORKING FORCE, 1917–18

WORKED BY —	LABOR CHANGES			ESTABLISHMENTS IN WHICH PROPORTIONS OF UNSTABLE WORKING FORCE TO TOTAL WORKING FORCE WERE —
UNSTABLE PART OF WORKING FORCE (THOUSANDS)	ACCESSIONS	SEPARATIONS	TOTAL (FLUX)	
10,221	12,825	14,904	27,729	20 per cent or less
30,543	32,062	33,792	65,854	Over 20 to 40 per cent
22,218	30,693	28,608	59,301	Over 40 to 60 per cent
15,714	17,626	18,903	36,529	Over 60 per cent
78,696	93,206	96,207	189,413	Total
	RATE PER FULL-YEAR WORKER, BASED ON UNSTABLE WORKING FORCE			
	ACCESSION	SEPARATION	FLUX	
	3.75	4.38	8.13	20 per cent or less
	3.15	3.33	6.48	Over 20 to 40 per cent
	4.14	3.87	8.01	Over 40 to 60 per cent
	3.36	3.60	6.96	Over 60 per cent
	3.54	3.66	7.20	Total

CHAPTER X

Relative Responsibility of Different Service Groups for Labor Mobility

The length-of-service figures given in Chapter VIII, although useful for some purposes, fail to report the true situation as to the proportion of the whole amount of shifting for which each different length-of-service group of separating employees must be held responsible. The principal difficulty with such a length-of-service classification as that shown in Table 34 is that the service periods in the scale are of unequal length and the numbers of those leaving during those unequal periods are, therefore, not strictly comparable. It is true that a revision was made in the last table presented in the chapter on length of service,[1] in which table the unequal time periods are equated by dividing the figures of each group by the number of weeks in the span of service time. This method, however, is not quite adequate, and in Table 47 the same set of length-of-service figures is so presented as to make in another and more accurate way the necessary correction for this disparity in length between the different service periods.[2]

The first column of the table is identical, except for decimals, with the corresponding figures for the active employees in Table 34. In column 2 the total number of labor hours worked by the employees of the fifty-three concerns in 1913–14 and the corresponding number worked by the employees of the thirty-four concerns in 1917–18, respectively, are distributed (for each of the two periods) in the same percentage proportions that hold for the employees who were on the pay roll at the end of the year.

[1] Table 42, p. 140.

[2] The method used in Table 47 was suggested to the writers by Mr. Lucian W. Chaney, of the U. S. Bureau of Labor Statistics.

TABLE 47

SEPARATION RATES IN SPECIFIED LENGTH-OF-SERVICE GROUPS

(Based on allocation of the total labor hours among the different length-of-service groups)

[Number of establishments reporting: 1913–14, 34; 1917–18, 53]

LENGTH-OF-SERVICE GROUP	PER CENT DISTRIBUTION OF EMPLOYEES ON PAY ROLL AT END OF YEAR (ACTIVE EMPLOYEES)	CORRESPONDING DISTRIBUTION OF LABOR HOURS IN EACH SPECIFIED LENGTH-OF-SERVICE GROUP (THOUSANDS)	SEPARATIONS	
			NUMBER IN EACH GROUP	RATE PER 3000 LABOR HOURS (FULL-YEAR WORKER) IN EACH GROUP [1]
	1913–14			
Three months or less	13.15	29,351	28,407	2.90
Over 3 months to 6 months	7.40	16,517	8,516	1.55
Over 6 months to 1 year	8.32	18,570	7,497	1.21
Over 1 year to 2 years	12.08	26,963	4,415	.49
Over 2 years to 3 years	11.14	24,865	2,162	.26
Over 3 years to 5 years	15.01	33,503	1,845	.17
Over 5 years	32.90	73,437	1,776	.07
Total	100.00	223,206 [2]	54,618	.74
	1917–18			
One week or less	2.25	4,695	16,476	10.53
Over 1 week to 2 weeks	2.50	5,216	9,664	5.56
Over 2 weeks to 1 month	4.11	8,576	11,541	4.04
Over 1 month to 3 months	9.83	20,511	18,912	2.76
Three months or less	18.69	38,998	56,593	4.35
Over 3 months to 6 months	8.39	17,506	11,770	2.02
Over 6 months to 1 year	12.56	26,208	9,813	1.12
Over 1 year to 2 years	14.57	30,402	6,645	.66
Over 2 years to 3 years	9.23	19,259	2,476	.39
Over 3 years to 5 years	8.81	18,383	2,780	.45
Over 5 years	27.75	57,903	3,015	.16
Total	100.00	208,659 [2]	93,092	1.34

[1] Calculated after this fashion:

$$\frac{28407}{2935\,1000} \times 3000 = 2.90.$$

[2] Aggregate number of labor hours worked, during the years covered, in the establishments represented in the table, for the war and pre-war periods respectively.

This reveals the number of full-year workers assignable to the various length of service groups. Column 3 is identical with the separation figures in Table 34. In column 4 are given the rates of separation per 3000 labor hours worked by each length of service group. These figures are obtained by dividing the number of separating employees who have served each specified time period by the number of labor hours worked by that group and multiplying the quotient by 3000. The resulting scale of separation rates gives a very good idea of the relative responsibility of the different service groups for excessive labor mobility and shows that the great bulk of it is caused by the short-time employee, very little of it, indeed, being due to the separation from service of employees who had served more than one year.

The separation rates for each of the different industry groups, presented in Table 48, are derived in exactly the same way as are the rates in the last column of Table 47.

TABLE

SEPARATION RATES IN SPECIFIED INDUSTRY GROUPS, CLASSIFIED ACCORDING TO AMONG THE DIFFERENT LENGTH-OF-SERVICE:

INDUSTRY GROUP	RATE OF SEPARATION PER FULL-YEAR WORKER IN EACH:					
	ONE WEEK OR LESS	OVER 1 WEEK TO 2 WEEKS	OVER 2 WEEKS TO 1 MONTH	OVER 1 MONTH TO 3 MOS.	OVER 3 MOS. TO 6 MOS.	OVER 6 MOS. TO 1 YEAR
Automobiles and parts	5.04	3.24	3.75	2.46	2.07	1.65
Chem. industr's and refineries	13.80	8.16	5.64	3.36	1.95	.99
Clothing and textile mfg.	24.00	8.19	4.08	4.32	1.44	1.44
Furniture and millwork	16.92	8.82	5.91	6.72	5.97	1.41
Machinery mfg.	7.38	4.20	3.00	2.13	2.13	1.05
Mercantile establishments	7.47	2.64	4.14	3.15	2.73	.87
Miscel. metal products mfg.	19.92	9.93	5.07	3.42	2.67	1.02
Printing and publishing	6.75	3.24	3.93	2.22	1.53	1.47
Public utilities:						
Gas and electricity	1.23	.69	1.95	1.23	.60	.48
Street railways	4.80	2.55	2.64	2.07	1.38	1.23
Tel. service	9.39	5.49	4.83	2.64	2.19	.93
All industries	10.53	5.56	4.04	2.76	2.02	1.12

Again, in Table 48, the rapidly declining separation rate figures along the length-of-service scale show how relatively little the long-service employees have to do with the labor shift. Some significant differences between the industry groups may be pointed out: In street railways and telephone service, two similar groups whose total separation rates are about equal, there is, nevertheless, a wide difference between the corresponding rates in the shortest service group. This would seem to indicate, as has been suggested in another chapter, that the telephone service industry is obliged to make much more frequent replacements of employees who have served less than a week than is the case with street railways. A similar disproportionately high separation rate among those who have worked less than a week is observable in the clothing and textile manufacturing group, which has for this minimum service period the highest rate of all the groups shown, and this despite the fact that the total separation rate for this industry group is slightly below the average.

48

LENGTH OF SERVICE. (BASED ON ALLOCATION OF THE TOTAL LABOR HOURS GROUPS). 1917–18 (53 establishments)

SPECIFIED LENGTH-OF-SERVICE GROUP					INDUSTRY GROUP
OVER 1 YEAR TO 2 YEARS	OVER 2 YEARS TO 3 YEARS	OVER 3 YEARS TO 5 YEARS	OVER FIVE YEARS	ALL GROUPS	
.78	.90	.39	.24	1.53	Automobiles and parts
.57	.39	.36	.18	1.9	Chem. industries and refineries
.75	.33	.51	.12	1.26	Clothing and textile mfg.
.93	.36	.54	.33	3.03	Furniture and millwork
.69	.24	.33	.12	1.11	Machinery mfg.
.78	.51	.63	.18	1.35	Mercantile establishments
.63	.30	.36	.12	2.28	Miscel. metal products mfg.
.66	.72	.78	.21	.93	Printing and publishing
					Public utilities:
.36	.24	.42	.15	.54	Gas and electricity
.63	.42	.60	.15	1.02	Street railways
.60	.36	.48	.18	1.05	Telephone service
.66	.39	.45	.16	1.34	All industries

This same analysis of the length of service data is followed in Table 49, which makes a comparison between skilled workers and semi-skilled or unskilled workers. The figures again exhibit a difference in stability in favor of skilled workers.[1]

TABLE 49

SEPARATION RATES IN SPECIFIED LENGTH-OF-SERVICE GROUPS OF SKILLED AND UNSKILLED WORKERS

(Based on allocation of the total labor hours among the length-of-service groups.)
(1913–1915. 17 establishments reporting)

LENGTH OF SERVICE GROUP	PER CENT DISTRIBUTION OF EMPLOYEES ON PAY ROLL AT END OF YEAR (ACTIVE EMPLOYEES)	CORRESPONDING DISTRIBUTION OF LABOR HOURS IN EACH SPECIFIED LENGTH-OF-SERVICE GROUP (THOUSANDS)	SEPARATIONS	
			NUMBER IN EACH GROUP	RATE PER FULL-YEAR WORKER IN EACH GROUP[2]
	SKILLED			
Three months or less	10.827	7,104	7,072	2.99
Over 3 months to 6 months	7.233	4,746	2,218	1.40
Over 6 months to 1 year	7.602	4,988	1,869	1.12
Over 1 to 2 years	14.580	9,567	932	.29
Over 2 to 3 years	11.411	7,488	640	.26
Over 3 to 5 years	15.029	9,861	412	.13
Over 5 years	33.318	21,862	536	.08
Total	100.000	65,616	13,679	.62
	SEMI-SKILLED AND UNSKILLED			
Three months or less	24.408	9,622	11,145	3.46
Over 3 months to 6 months	11.550	4,553	2,875	1.89
Over 6 months to 1 year	8.341	3,288	2,065	1.88
Over 1 to 2 years	12.446	4,906	1,211	.74
Over 2 to 3 years	12.623	4,976	545	.33
Over 3 to 5 years	14.067	5,545	400	.22
Over 5 years	16.565	6,530	308	.14
Total	100.000	39,420	18,549	1.41

[1] See, for other statistical data on skilled and unskilled workers, Tables 19, 24, and 39.

[2] Obtained by dividing the number of separations in each group by corresponding number of labor hours and multiplying by 3000.

FREQUENCY OF JOB REPLACEMENT IN DIFFERENT LENGTH-OF-SERVICE GROUPS

It has already been pointed out that, as is quite obvious, there is enormous variation in the turnover distribution in relation directly to length of service, that the jobs held by the newly hired employees — whether they are skilled mechanics' jobs or unskilled laborers' jobs — are responsible for a preponderating share of the separations. For some jobs there is evidently a very

TABLE 50

RELATIVE FREQUENCY OF JOB REPLACEMENT IN SPECIFIED LENGTH-OF-SERVICE GROUPS. 1917–1918

(53 establishments reporting)

LENGTH-OF-SERVICE GROUP	SEPARATED EMPLOYEES WHO SERVED CONTINUOUSLY EACH CLASSIFIED PERIOD		MEAN LENGTH OF SERVICE (DAYS)	TOTAL NUMBER OF MAN-DAYS WORKED BY EACH GROUP DURING THE YEAR	EQUIVALENT FULL-YEAR POSITIONS IN EACH GROUP		NUMBER OF PERSONS IN EACH EQUIVALENT FULL-YEAR POSITION DURING THE YEAR
	NUMBER	PERCENTAGE DISTRIBUTION			NUMBER	PERCENTAGE DISTRIBUTION	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1918							
One week or less .	16,476	21.1	4	65,904	180.56	1.1	91.3
Over 1 to 2 weeks	9,664	12.4	11	106,304	291.24	1.8	33.2
Over 2 wks. to 1 mo.	11,541	14.8	22	253,902	695.62	4.4	16.6
Over 1 to 3 months	18,912	24.2	60	1,134,720	3,108.82	19.4	6.1
Over 3 to 6 months	11,770	15.0	135	1,588,950	4,353.29	27.2	2.7
Over 6 mo. to 1 yr.	9,813	12.5	273	2,688,762	7,366.47	46.1	1.3
Total . . .	78,176	100.0		5,838,542	15,996.01	100.0	

high "rotation in office"; for others the frequency of shift is much lower. It is very important to know what proportion of the jobs in a plant is subject to high, and what proportion to low, rotation frequencies. An attempt to indicate this is made in Table 50 above, which presents a further analysis of the service distribution of 78,176 persons who, before they had

served more than a year, left the service of the 53 establishments reporting the necessary data in 1918.[1]

The principal object of this table is to show (1) in what length-of-service sections of the working force the labor shift and replacement is most frequent and how frequent it is in those sections, and (2) how many full-time jobs are directly affected by these respective intensities of mobility in the different parts of the working force. To throw light on these two points it is first of all necessary to hit upon an average length of service for each of the original service groups. For this average the arithmetic mean has been taken — the mean length of time between the minimum and maximum time in each group. The assumption here — and upon this assumption the whole of the following analysis rests — is that the sum of the individual service deviations (plus or minus) from the mean is zero or very close to zero.[2] It would seem probable from what slight information is available that considerably more individual service records fall below the mean time than above it — that is to say, so many "floaters" work only a day or two that the time average for the first group

[1] This method was applied originally in an analysis of labor turnover data from the San Francisco Bay region. 8 *Mo. Labor Rev.* 363–380. (February, 1919.)

[2] This assumption is confirmed by the following:

In two Cincinnati shops the length-of-service distribution of 1990 employees (in all occupations) leaving in 1918, the aggregate number of days worked by them, and the average length of service in each group are as follows:

Length-of-Service Period	Separated Employees Who Served Continuously Each Classified Period	Total Days Worked	Average Days of Service
One week or less	439	1,561	3.56
Over 1 week to 2 weeks	275	2,934	10.67
Over 2 weeks to 1 month	348	7,495	21.54
Over 1 month to 3 months	527	29,184	55.38
Over 3 months to 6 months	244	31,488	129.05
Over 6 months to 1 year	157	39,663	252.63
Total	1,990	112,325	

is possibly two days rather than four. This probable lag of the true average of individual cases behind the mean length of service which has been used is undoubtedly greatest in the one-week-and-under group and certainly cannot be of any serious consequence in the longer groups. In any case the effect of this probable lag or negative deviation is to produce a somewhat lower turnover figure. Thus, if two days be taken as the basic average for the first group, there would appear in this rapidly changing part of the working force a group of 90 jobs, in each of which there were 90 replacements during one year, whereas, on the four days' basis it is a group of 180 jobs, each having 90 replacements annually. In short, the mean length of service is, especially for the very short periods, more nearly an outside figure for, rather than an average of, the individual cases.

It should be noted also that the calculation is based upon the calendar year of 365 days and not upon the number of days worked by a "fully employed person," which latter basis is used in other parts of this book in computing the number of full-time jobs or standard working force.

This method of working out the results in Table 50 may be illustrated by the figures for the first group. On the basis of the assumption explained above, each of 16,476 persons worked an average of 4 days. Assuming that all jobs were continuously occupied, it follows that the number of successive incumbents of each job subject to this maximum frequency of "rotation in office" must have been 365 divided by 4, or 91.3. Similarly there must have been 33.2 persons in successive occupancy of each of the jobs held by the one-to-two-weeks group, and so on. This constitutes a series of constants, supplementing the mean-length-of-service constants in column 4 and indicating the average number of men required during the year to hold down each job in each of the specified time groups. The next step is to ascertain the number of jobs, each of which is successively occupied by 91 employees, 33 employees, etc., during the year. This is done by dividing the number of man-days worked in each group

(the product of the mean length of service by the number of employees in the group) by 365. This indicates that in the one-week-and-under group there are 181 jobs, to each of which an average job replacement frequency rate of 91 incumbents per year applies. Similarly in the over-one-to-two-weeks group there are 291 jobs (2 per cent of all the full-time jobs) in which there are 32 replacements a year; and at the other end of the scale, in the 6-months-to-one-year group, 7366, or 46 per cent of all full-time jobs, in which there are $1\frac{1}{3}$ replacements a year. The figures indicate, in other words, the numbers of full-time jobs in which there were the classified numbers of incumbents per year. They mean, e.g., that on the average each of the 181 full-time jobs in the first and shortest group had 91 incumbents during the year.

At the relatively stable end of the length-of-service scale it appears that the six-months-to-one-year group, numbering 9813, who had occupied 7366, or 46 per cent, of the full-time jobs, contributed 13 per cent of the separations and suffered one replacement a year. At the unstable end of the scale it is evident that the under-one-week group, numbering 16,476 employees, who had occupied 181, or 1 per cent of the full-time jobs, contributed 21 per cent of the separations and suffered 90 replacements a year. In this most unstable group, where the jobs naturally suffer the highest replacement frequency, it would appear that in each of 181 full-time jobs there were, on the average, 90 new men hired, and this little group of jobs was occupied at one time or another during the year by 16,476 persons, who made up 21 per cent of the separations and, consequently, were responsible for that proportion of the turnover. It is realized that these conclusions are based upon the estimated figures for the mean length of service in each time period. This makes it impossible in every case to check the derived figures of Table 50 with the direct figures reported from the establishments, but does not appear to invalidate the general conclusion.

CHAPTER XI

Employment Records

The establishment employment records primarily needed for the development of useful statistics of labor mobility on the lines indicated in the body of this book are:

(1) Number of labor hours worked,
   a. In the shape of clock records or other records of labor, time, or
   b. To be derived from daily attendance records, or
   c. From amounts paid out in wages at various rates,
   d. From pay-roll records by some method of discounting gross pay roll for both absentee-time and fractional-pay-period time.
(2) Number of accessions.
(3) Number of separations,
   a. Number leaving voluntarily,
   b. Number laid off,
   c. Number discharged.

For the convenient recording of the above items some such record-form as the one on pages 164–165 is suggested.

The information called for in Form 1 should be recorded daily. The daily record can, of course, be kept on the same form, if the column at the right be left blank for insertion of the time unit desired. The figures should, if possible, be shown separately by plant occupations or operating departments. The daily records for any division, or for the plant as a whole, can, at the end of the month, be totaled and entered on the monthly record shown here. This monthly record, in turn, can be totaled and entered, at the end of the year on a corresponding form showing the annual mobility record for each department.

FORM 1: LABOR

OCCUPATION OR

MONTH (OR DAY, WEEK OR YEAR)	SIZE OF WORK FORCE (Base for computation: The 3 methods to be used in order of preference, method 1 being preferred)			NUMBER		
	Method 3	Method 2	Method 1		Leaving Employ	
	Average number of employees on pay roll	Average daily number actually at work	Total number of labor hours put in by all employees during year	Hired (Accessions)	Discharged	Laid off
January						
February						
March						
April						
May						
June						
July						
August						
September						
October						
November						
December						
Year						

The figures for "size of work force" are of prime importance, but, except for ordinary pay-roll data, they are kept by very few employers — and even when such figures are kept they are not usually put in the same record with data on number of employees entering and leaving, with the result that it is very difficult to get all factors upon a common footing for purposes of computation. Method (1) is believed to be the best of the three. The first alternative to this actual number of labor hours is the average daily number actually at work. These attendance figures may be converted to labor hours by first multiplying by the number of days worked and then by the number of hours in the regular work-day and, finally, subtracting, from the resulting gross number of labor hours a number of hours considered to be equivalent to the time lost through the absenteeism of active

MOBILITY

DEPARTMENT: _____

LABOR CHANGES									
NUMBER			RATE PER FULL-YEAR WORKER						MONTH (OR DAY, WEEK OR YEAR)
(Separations)		Labor flux (Accessions plus separations)	Accession	Separation				Labor Flux	
Left voluntarily	Total			Discharge	Lay off	Voluntary leaving	Total		
									January
									February
									March
									April
									May
									June
									July
									August
									September
									October
									November
									December
									Year

employees and the time not worked by employees who failed to work the full pay period. The second alternative to actual labor hours is the average number of employees on the pay roll. These figures may be converted to labor hours by multiplying them by the number of days worked during the month, and that product in turn by the prevailing number of hours worked per day during the month or other period considered.

Length-of-service figures are very important, especially in reference to the employees who leave. For each separating employee a record should be kept of the time of his continuous service and entered monthly, or as often as considered desirable, on some such form as the one shown on pages 166–167.

The scale of time periods shown above is that used in the more recent of the two labor mobility investigations made by the

FORM 2:

MONTH (OR

DEPARTMENT OR OCCUPATION GROUP	NUMBER OF SEPARATING EMPLOYEES				
	1 WEEK OR LESS	OVER 1 TO 2 WEEKS	OVER 2 WEEKS TO 1 MONTH	OVER 1 TO 3 MONTHS	OVER 3 TO 6 MONTHS
All departments					

Bureau of Labor Statistics. Somewhat different classifications may be found more useful for some concerns, but, whatever scale is used, it should be split up into very short time periods for the first weeks and months of service time. The number serving less than one week should by all means be shown in the records, for the great bulk of the labor shift will fall in these very short periods.

The foregoing items represent the most important data necessary for keeping a constant check on the extent of labor mobility and the progress being made in different departments toward controlling it. Whatever forms are used should be so flexible that they can be adapted to specialized treatment of a problem and be made to serve for any desired period. It is recommended that the following records should certainly be kept:

A daily record of men hired and transferred, giving name, number, department, job, and rate of pay. A record of all men

LENGTH-OF-SERVICE

YEAR, ETC.)_____

WHO HAD WORKED CONTINUOUSLY						
OVER 6 MONTHS TO 1 YEAR	OVER 1 TO 2 YEARS	OVER 2 TO 3 YEARS	OVER 3 TO 5 YEARS	OVER 5 YEARS	TOTAL	DEPARTMENT OR OCCUPATION GROUP
						All departments

leaving, giving the date hired and date leaving, type of separation, length of service, either the actual time in years, months, or days, or giving it in definite classified periods. Such a record has the advantage that it is possible to combine the figures for any department for any job or for any desired period.

ABSENTEE RECORDS

Some record should be kept of absentees. This is especially important for establishments where it is found to be necessary to compute the mobility rates on the basis of pay-roll figures which will need to be discounted for the amount of absenteeism. The form on pages 168–169 is suggested for absentee records.

Absentee records will fall under two major divisions: daily and monthly. Each of these must contain both quantitative and qualitative information. The quantitative data show, not only the number of employees absent, but also the number of hours

lost. Thus an employee absent forty days with a broken leg should count as one case, but in his record there should also be shown the equivalent labor hours involved in forty days' absence.

The qualitative data analyze causes of absenteeism. The

FORM 3:

OCCUPATION OR

MONTH	SIZE OF WORK FORCE (Base for computation: The 3 methods to be used in order of preference, method 1 being preferred)		
	Method 3	Method 2	Method 1
	Average number of employees on pay roll	Average daily number actually at work	Total number of labor hours put in by all employees during year
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			
Year			

main items will be "laid off," "reported off" (absences reported in advance), "vacations," "occupational injury," "sickness," "sickness in home," "death in home," "grievance," "unknown." These may be classified into unavoidable and avoidable absence, and the latter as to whether it is excusable or inexcusable.

ABSENTEEISM

DEPARTMENT:_____

NUMBER OF ABSENTEES	LABOR HOURS LOST BY ABSENTEES	RATE OF ABSENTEEISM PER FULL-YEAR WORKER		MONTH
		ABSENTEE CASES	LABOR HOURS LOST	
				January February March April May June July August September October November December
				Year

APPENDIX

BASIC TABLES

TABLE

LABOR MOBILITY IN INDIVIDUAL

1913–

INDUSTRY OR NATURE OF BUSINESS	ESTABLISHMENT NUMBER*	NUMBER OF FULL-YEAR WORKERS	LABOR HOURS (THOUSANDS)	ACCESSIONS
	BOSTON			
Auto accessories, mfg.	1	960	2,880	2,460
Railroad shops	2	2,001	6,003	545
Rubber wearing apparel, mfg.[1]	3	1,367	4,101	1,737
Rubber footwear and auto tires	4	2,856	8,568	3,284
Shoes, mfg.	5	3,825	11,475	4,749
Shoe machinery, mfg.	6	2,549	7,647	648
Department Store[2]	7	1,839	5,517	824
Steam gauges and valves, mfg.[1]	8	167	501	109
Plumbing tools, mfg.[1]	9	212	636	490
Brass valves and fittings, mfg.[1]	10	899	2,697	880
Paper prod's and roofing material, mfg.	11	864	2,592	477
Paper boxes and shipping tags, etc.[1]	12	1,749	5,247	1,285
Color printing, etc.	13	726	2,178	370
Book mfg.	14	449	1,347	99
Public utilities: Street railways	15	3,060	9,180	354
Elevated railways	16	8,858	26,574	1,145
Telephone service[3]	17	2,750	8,250	603
Total	[17]	35,131	105,393	20,059
	CHICAGO			
Chewing gum, mfg.	18	273	819	341
Shoe bottoms, mfg.	19	277	831	148
Agricultural implements, mfg.	20 (105)	4,377	13,131	1,546
Agricultural implements, mfg.	21 (106)	6,592	19,776	1,946
Agricultural implements, mfg.	22	1,904	5,712	289
Agricultural implements, mfg.	23	761	2,283	397
Elevating machinery, mfg.[1]	24	503	1,509	562
Car works[4]	25 (102)	9,661	28,983	13,513
Structural steel fabricating	26 (113)	243	729	168
Mail order house	27	9,430	28,290	8,834
Electrical supplies, mfg.	28 (117)	544	1,632	686
Valves and fittings, mfg.	29	4,306	12,918	517
Iron wheels and castings, mfg.[5]	30 (115)	415	1,245	616
Steel products, mfg.	31	3,758	11,274	2,038
Telephone apparatus, mfg.[1]	32	11,049	33,147	20,095
Slaughtering and meat packing[5]	33	12,519	37,557	8,117
Slaughtering and meat packing[1]	34 (126)	5,522	16,566	16,486
Total	[17]	72,134	216,402	76,299

** Notes to this table will

A**

ESTABLISHMENTS, 1913–14 AND 1917–18
14°

LABOR CHANGES					
NUMBER		RATE PER FULL-YEAR WORKER			INDUSTRY OR NATURE OF BUSINESS
SEPARATIONS	TOTAL	ACCESSION	SEPARATION	FLUX	
		BOSTON			
1,391	3,851	2.55	1.44	3.99	Auto accessories, mfg.
648	1,193	.27	.33	.60	Railroad shops
1,972	3,709	1.26	1.44	2.70	Rubber wearing apparel, mfg.[1]
2,801	6,085	1.14	.99	2.13	Rubber footwear and auto tires
5,046	9,795	1.23	1.32	2.55	Shoes, mfg.
1,425	2,073	.24	.57	.81	Shoe machinery, mfg.
842	1,666	.45	.45	.90	Department Store [2]
130	239	.60	.78	1.38	Steam gauges and valves, mfg.[1]
427	917	2.31	2.01	4.32	Plumbing tools, mfg. [1]
951	1,831	.99	1.05	2.04	Brass valves & fittings, mfg.[1]
505	982	.54	.57	1.11	Pap'r prod. & roof'g mat., mfg.
1,009	2,294	.72	.57	1.29	Pap'r box's & ship'g tags, etc.[1]
373	743	.51	.51	1.02	Color printing, etc.
150	249	.21	.33	.54	Book mfg.
412	766	.12	.12	.24	Public utilities: Street railw's
1,164	2,309	.12	.12	.24	Elev. railw's
466	1,069	.21	.18	.39	Tel. service [3]
19,712	39,771	.57	.57	1.14	Total
		CHICAGO			
329	670	1.26	1.20	2.46	Chewing gum, mfg.
206	354	.54	.75	1.29	Shoe bottoms, mfg.
2,808	4,354	.36	.63	.99	Agricultural implements, mfg.
4,115	6,061	.30	.63	.93	Agricultural implements, mfg.
992	1,281	.15	.51	.66	Agricultural implements, mfg.
778	1,175	.51	1.02	1.53	Agricultural implements, mfg.
483	1,045	1.11	.96	2.07	Elevating machinery, mfg. [1]
20,504	34,017	1.41	2.13	3.54	Car works [4]
212	380	.69	.87	1.56	Structural steel fabricating
8,627	17,461	.93	.90	1.83	Mail order house
700	1,386	1.26	1.29	2.55	Electrical supplies, mfg.
888	1,405	.12	.21	.33	Valves and fittings, mfg.
606	1,222	1.47	1.47	2.94	Iron wheels and castings, mfg.[5]
3,055	5,093	.54	.81	1.35	Steel products, mfg.
16,163	36,258	1.83	1.47	3.30	Telephone apparatus, mfg. [1]
8,096	16,213	.65	.65	1.30	Slaughtering and meat pack'g [6]
15,146	31,632	3.00	2.73	5.73	Slaughtering and meat pack'g [1]
83,708	160,007	1.06	1.16	2.22	Total

be found on pages 188–189.

TABLE

LABOR MOBILITY IN INDIVIDUAL
1913–

INDUSTRY OR NATURE OF BUSINESS	ESTABLISHMENT NUMBER *	NUMBER OF FULL-YEAR WORKERS	LABOR HOURS (THOUSANDS)	ACCESSIONS
	CINCINNATI			
Machine tools, mfg. [1]	35 (144)	476	1,428	671
Machine tools, mfg. [5]	36 (141)	624	1,872	1,282
Engineering specialties, mfg.	37 (146)	656	1,968	221
Total	[3]	1,756	5,268	2,174
	CLEVELAND			
Clothing mfg.	38	1,020	3,060	320
Clothing, men's, mfg.	39	783	2,349	296
Machine tools, mfg.	40 (172)	335	1,005	431
Metal wire, etc., mfg. [6]	†41 (178) (184)	1,247	3,741	1,181
Machine tools, mfg. [6]	42 (192)	1,111	3,333	1,609
Total	[5]	4,496	13,488	3,837
	DETROIT			
Aluminum and brass foundry	43	397	1,191	2,389
Motor car, mfg. [1]	44	2,146	6,438	4,724
Motor car, gasoline, mfg.	45	715	2,145	2,405
Transmissions and gears, mfg.	46	239	717	562
Motor car, mfg.	47 (205)	3,110	9,330	8,695
Motor car, mfg.	48 (194)	10,904	32,712	5,071
Motor car, mfg.	49	731	2,193	1,006
Motor car, mfg.	50 (198)	897	2,691	1,365
Motor car, mfg.	51 (200)	4,028	12,084	4,120
Motor car, mfg.	52	287	861	1,737
Motor car, mfg.	53	4,484	13,452	10,033
Automobile parts, mfg.	54 (207)	1,004	3,012	1,827
Adding machine, mfg.	55	1,887	5,661	912
Public utilities: Gas mfg.	56	650	1,950	91
Total	[14]	31,479	94,437	44,937

A — *Continued*

ESTABLISHMENTS, 1913–14 AND 1917–18
14°

LABOR CHANGES					INDUSTRY OR NATURE OF BUSINESS
NUMBER		RATE PER FULL-YEAR WORKER			
SEPARATIONS	TOTAL	ACCESSION	SEPARATION	FLUX	
		CINCINNATI			
748	1,419	1.41	1.56	2.97	Machine tools, mfg. [1]
970	2,252	2.04	1.56	3.60	Machine tools, mfg. [5]
283	504	.34	.43	.77	Engineering specialties, mfg.
2,001	4,175	1.23	1.14	2.37	Total
		CLEVELAND			
454	774	.30	.45	.75	Clothing mfg.
430	726	.39	.54	.93	Clothing, men's, mfg.
270	701	1.29	.81	2.10	Machine tools, mfg.
876	2,057	.96	.69	1.65	Metal wire, etc., mfg. [5]
1,825	3,434	1.44	1.65	3.09	Machine tools, mfg. [6]
3,855	7,692	.84	.87	1.71	Total
		DETROIT			
2,145	4,534	6.03	5.40	11.43	Aluminum and brass foundry
5,255	9,979	2.19	2.46	4.65	Motor car, mfg. [1]
1,709	4,114	3.36	2.40	5.76	Motor car, gasoline, mfg.
532	1,094	2.34	2.22	4.56	Transmissions and gears, mfg.
8,629	17,324	2.79	2.76	5.55	Motor car, mfg.
6,508	11,579	.48	.60	1.08	Motor car, mfg.
1,101	2,107	1.38	1.50	2.88	Motor car, mfg.
1,411	2,776	1.53	1.56	3.09	Motor car, mfg.
2,895	7,015	1.02	.72	1.74	Motor car, mfg.
1,350	3,087	6.06	4.71	10.77	Motor car, mfg.
13,256	23,289	2.25	2.97	5.22	Motor car, mfg.
1,918	3,745	1.83	1.92	3.75	Automobile parts, mfg.
1,583	2,495	.48	.84	1.32	Adding machine, mfg.
202	293	.15	.30	.45	Public utilities: Gas mfg.
48,494	93,431	1.44	1.53	2.97	Total

TABLE

LABOR MOBILITY IN 1913–

INDUSTRY OR NATURE OF BUSINESS	ESTABLISHMENT NUMBER*	NUMBER OF FULL-YEAR WORKERS	LABOR HOURS (THOUSANDS)	ACCESSIONS
		MILWAUKEE		
Excavating machinery, mfg.	57	955	2,865	419
Electrical appliances, mfg.	58 (257)	642	1,926	361
Total	[2]	1,597	4,791	780
		NEW YORK		
Crackers and biscuits, baking	59	1,111	3,333	2,032
Cotton specialties, mfg.	60	785	2,355	1,277
Printing presses, mfg.	61	1,438	4,314	1,479
Mail order house	62	624	1,872	1,071
Life insurance [5]	63	3,679	11,037	780
Locks and hardware, mfg. [1]	64	3,596	10,788	3,943
Paper products, mfg.	65	1,778	5,334	1,620
Public utilities: Street railways [5]	66	3,622	10,866	2,595
Telephone service	67	19,051	57,153	7,862
Total	[9]	35,684	107,052	22,659
		OTHER CITIES		
Rubber goods, mfg. [7] (Ohio)	68	5,246	15,738	11,676
Rubber tires, mfg. [5] (Ohio)	69	639	1,917	903
Sheet-metal ware, mfg. [5] (N. Y.)	70	564	1,692	1,149
Elevating machine, mfg. (Ohio)	71	1,632	4,896	968
Lighting apparatus, mfg. (Ohio)	72	1,087	3,261	1,120
Cash registers, mfg. (Ohio)	73	5,034	15,102	1,749
Silk, mfg. (Conn.)	74	3,967	11,901	1,260
Insurance (Conn.)	75	971	2,913	394
Typewriters, mfg. (Conn.)	76	2,894	8,682	885
Cotton and worsted, mfg. (N. H.)	77	13,791	41,373	11,751
Automobile mfg. (Mich.)	78	477	1,431	3,625
Agricultural implement mfg. [5] (Ill.)	79	517	1,551	1,059
Hat mfg. (Pa.)	80	4,496	13,488	811
Electrical apparatus, mfg. [1] (Pa.)	81	10,665	31,995	12,429
Bleaching and dyeing (R. I.)	82	1,516	4,548	1,074
Machine tool mfg. [8] (R. I.)	83	4,323	12,969	4,087
Electrical apparatus, mfg. (N. Y.)	84	13,064	39,192	1,323
Total	[17]	70,883	212,649	56,263

A — *Continued*

INDIVIDUAL ESTABLISHMENTS

14°

LABOR CHANGES					
NUMBER		RATE PER FULL-YEAR WORKER			INDUSTRY OR NATURE OF BUSINESS
SEPARATIONS	TOTAL	ACCESSION	SEPARATION	FLUX	
		MILWAUKEE			
563	982	.45	.60	1.05	Excavating machinery, mfg.
665	1,026	.57	1.05	1.62	Electrical appliances, mfg.
1,228	2,008	.48	.78	1.26	Total
		NEW YORK			
1,395	3,427	1.83	1.26	3.09	Crackers and biscuits, baking
1,055	2,332	1.62	1.35	2.97	Cotton specialties, mfg.
1,217	2,696	1.02	.84	1.86	Printing presses, mfg.
936	2,007	1.71	1.50	3.21	Mail order house
266	1,046	.21	.06	.27	Life insurance [5]
3,363	7,306	1.11	.93	2.04	Locks and hardware, mfg. [1]
1,642	3,262	.90	.93	1.83	Paper products, mfg.
2,770	5,365	.72	.75	1.47	Public utilities: Street railw's [5]
10,320	18,182	.42	.54	.96	Tel. service
22,964	45,623	.63	.63	1.26	Total
		OTHER CITIES			
8,070	19,746	2.22	1.53	3.75	Rubber goods, mfg. [7] (Ohio)
1,028	1,931	1.41	1.62	3.03	Rubber tires, mfg. [5] (Ohio)
1,072	2,221	2.04	1.89	3.93	Sheet-metal ware, mfg. [5] (N. Y.)
919	1,887	.60	.57	1.17	Elevating mach., mfg. (Ohio)
1,063	2,183	1.02	.99	2.01	Lighting appar., mfg. (Ohio)
3,451	5,200	.36	.69	1.05	Cash registers, mfg. (Ohio)
1,152	2,412	.33	.30	.63	Silk, mfg. (Conn.)
293	687	.42	.30	.72	Insurance (Conn.)
948	1,833	.30	.33	.63	Typewriters, mfg. (Conn.)
12,300	24,051	.84	.90	1.74	Cotton & worsted, mfg. (N. H.)
3,424	7,049	7.59	7.20	14.79	Automobile mfg. (Mich.)
847	1,906	2.04	1.65	3.69	Agricul. impl. mfg. [5] (Ill.)
1,101	1,912	.18	.24	.42	Hat mfg. (Pa.)
16,748	29,177	1.17	1.56	2.73	Elec. apparatus, mfg. [1] (Pa.)
1,300	2,374	.72	.87	1.59	Bleaching and dyeing (R. I.)
3,275	7,362	.96	.75	1.71	Machine tool mfg. [8] (R. I.)
4,754	6,077	.09	.36	.45	Elec. apparatus, mfg. (N. Y.)
61,745	118,008	.78	.87	1.65	Total

TABLE

LABOR MOBILITY IN 1917–

INDUSTRY OR NATURE OF BUSINESS	ESTABLISHMENT NUMBER *	NUMBER OF FULL-YEAR WORKERS	LABOR HOURS (THOUSANDS)	ACCESSIONS
		CHICAGO [a]		
Motors and railway supplies, mfg. [9]	101	1,954	5,862	4,460
Car works	102 (25)	7,287	21,861	18,837
Clothing, men's, mfg.	103	6,027	18,081	5,731
Printing presses, mfg.	104	764	2,292	510
Agricultural implements, mfg.	105 (20)	4,211	12,633	2,865
Agricultural implements, mfg.	106 (21)	5,759	17,277	5,486
Machinery (coal mining), mfg.	107	611	1,833	782
Machinery (specialties), mfg.	108	335	1,005	880
Mail order house	109	14,731	44,193	13,792
Mail order house	110	1,042	3,126	1,358
Mail order house	111	2,031	6,093	3,485
Mail order house	112	5,092	15,276	12,283
Structural steel fabricating [10]	113 (26)	402	1,206	446
Brass and metal specialties, mfg.	114	283	849	590
Iron wheels and castings, mfg. [10]	115 (30)	390	1,170	1,208
Office appliances, mfg. [9]	116	667	2,001	1,879
Electrical supplies, mfg.	117 (28)	733	2,199	2,105
Iron castings, mfg.	118	950	2,850	2,867
Screw machine products, mfg. [11]	119	520	1,560	1,703
Steel forgings [12]	120	1,099	3,297	4,837
Electrical supplies, mfg.	121	258	774	944
Public utilities: Electricity	122	4,728	14,184	5,193
Gas mfg.	123	4,725	14,175	6,527
Telephone service	124	13,604	40,812	9,524
Street railways [13]	125	3,909	11,727	3,201
Slaughtering and meat packing	126 (34)	8,730	26,190	19,050
Slaughtering and meat packing	127	14,320	42,960	32,374
Slaughtering and meat packing [10]	128	5,219	15,657	20,014
Total	[28]	110,381	331,143	182,931
		CINCINNATI [b]		
Soap, glycerine, etc.	129	1,953	5,859	4,046
Ink mfg.	130	708	2,124	2,062
Soap, glycerine, etc.	131	400	1,200	1,924
Clothing, women's, mfg.	132	234	702	187
Textiles (cotton), mfg.	133	330	990	354
Mill work (building material)	134	275	825	675
Leather goods, mfg.	135	467	1,401	728
Rubber goods, mfg.	136	110	330	304

A — *Continued*

INDIVIDUAL ESTABLISHMENTS
18°

LABOR CHANGES					
NUMBER		RATE PER FULL-YEAR WORKER			INDUSTRY OR NATURE OF BUSINESS
SEPARATIONS	TOTAL	ACCESSION	SEPARATION	FLUX	
		CHICAGO[a]			
3,996	8,456	2.28	2.04	4.32	Motors and ry. supplies, mfg.[9]
20,642	39,479	2.58	2.82	5.40	Car works
7,240	12,971	.96	1.20	2.16	Clothing, men's, mfg.
471	981	.66	.63	1.29	Printing presses, mfg.
2,962	5,827	.69	.69	1.38	Agricultural implements, mfg.
4,729	10,215	.96	.81	1.77	Agricultural implements, mfg.
764	1,546	1.29	1.26	2.55	Machinery (coal mining), mfg.
967	1,847	2.64	2.88	5.52	Machinery (specialties), mfg.
15,784	29,576	.93	1.08	2.01	Mail order house
1,332	2,690	1.29	1.29	2.58	Mail order house
3,332	6,817	1.71	1.65	3.36	Mail order house
12,333	24,616	2.40	2.43	4.83	Mail order house
370	816	1.11	.93	2.04	Structural steel fabricating[10]
536	1,126	2.10	1.89	3.99	Brass and metal spec'l's, mfg.
858	2,066	3.09	2.19	5.28	Iron wheels and castings, mfg.[10]
1,712	3,591	2.82	2.58	5.40	Office appliances, mfg.[9]
1,965	4,070	2.88	2.67	5.55	Electrical supplies, mfg.
2,767	5,634	3.03	2.91	5.94	Iron castings, mfg.
1,681	3,384	3.27	3.24	6.51	Screw machine products, mfg.[11]
2,734	7,571	4.41	2.49	6.90	Steel forgings[12]
868	1,812	3.66	3.36	7.02	Electrical supplies, mfg.
6,234	11,427	1.11	1.32	2.43	Public utilities: Electricity
6,300	12,827	1.38	1.32	2.70	Gas mfg.
11,454	20,978	.69	.84	1.53	Tel. service
3,809	7,010	.81	.96	1.77	Street rys.[13]
16,062	35,112	2.19	1.83	4.02	Slaughtering & meat pack'g.
27,890	60,264	2.25	1.95	4.20	Slaughtering & meat pack'g.
17,418	37,432	3.84	3.33	7.17	Slaughtering & meat pack'g.[10]
177,210	360,141	1.65	1.62	3.27	Total
		CINCINNATI[b]			
3,270	7,316	2.07	1.68	3.75	Soap, glycerine, etc.
1,658	3,720	2.91	2.34	5.25	Ink mfg.
1,834	3,758	4.80	4.59	9.39	Soap, glycerine, etc.
180	367	.81	.78	1.59	Clothing, women's, mfg.
369	723	1.08	1.11	2.19	Textiles (cotton), mfg.
705	1,380	2.46	2.55	5.01	Mill work (building material)
886	1,614	1.56	1.89	3.45	Rubber goods, mfg.
300	604	2.76	2.73	5.49	Leather goods, mfg.

TABLE

LABOR MOBILITY IN 1917–

INDUSTRY OR NATURE OF BUSINESS	ESTABLISHMENT NUMBER *	NUMBER OF FULL-YEAR WORKERS	LABOR HOURS (THOUSANDS)	ACCESSIONS
	CINCINNATI [b] —			
Machine tools, mfg.	137	127	381	103
Machine tools, mfg.	138	602	1,806	622
Machinery (specialties), mfg.	139	669	2,007	847
Machinery mfg.	140	407	1,221	502
Machine tools, mfg.	141 (36)	883	2,649	1,363
Machine tools, mfg.	142	602	1,806	1,020
Electrical machinery, mfg.	143	1,443	4,329	2,444
Machine tools, mfg.	144 (35)	1,194	3,582	2,146
Machine tools, mfg.	145	310	930	786
Engineering specialties, mfg.	146 (37)	1,150	3,450	2,030
Office appliances	147	418	1,254	1,051
Foundry (stoves and furnaces), mfg.	148	440	1,320	1,138
Tin can mfg.	149	529	1,587	1,850
Printing and publishing (books)	150	244	732	82
Printing and publishing (misc.)	151	767	2,301	667
Printing and publishing (etc.)	152	617	1,851	2,212
Public utilities: Gas and electric	153	721	2,163	361
Telephone service	154	1,769	5,307	777
Street railways [14]	155	1,330	3,990	636
Total	[27]	18,699	56,097	30,917
	CLEVELAND [c]			
Automobile and motor truck mfg.[15]	156 [d]	4,456	13,368	3,552
Automobile and motor truck mfg.	157	1,417	4,251	2,643
Automobile and motor truck mfg.	158	2,173	6,519	5,179
Street railway cars, mfg.	159	344	1,032	1,016
Tractors, mfg.[16]	160	384	1,152	1,746
Auto. parts, mfg.[17]	161	518	1,554	2,280
Auto. frames, steel stampings, mfg.[18]	162	770	2,310	4,484
Paint and varnish mfg.	163	267	801	568
Storage batteries, mfg.	164	1,987	5,961	6,075
Paint and varnish mfg.	165	105	315	324
Storage batteries, carbon products,[11]	166	1,610	4,830	6,036
Clothing, women's, mfg.	167 [e]	1,431	4,293	1,611
Bags (paper and cloth), mfg.	168	1,004	3,012	3,378
Woodw'k, sewing machine cabinets [19]	169	1,514	4,542	3,410
Automatic screw machinery, mfg.	170	2,430	7,290	3,510
Machinery (heavy), mfg.	171	984	2,952	1,575
Machine tools, mfg.	172 (40)	1,263	3,789	3,520
Machinery (heavy), mfg.	173	940	2,820	2,691
Molding machinery, mfg.[20]	174	98	294	280
Motors, mfg.[21]	175	870	2,610	3,548

A — *Continued*

INDIVIDUAL ESTABLISHMENTS
18°

LABOR CHANGES					
NUMBER		RATE PER FULL-YEAR WORKER			INDUSTRY OR NATURE OF BUSINESS
SEPARATIONS	TOTAL	ACCESSION	SEPARATION	FLUX	
Continued					
73	176	.81	.57	1.38	Machine tools, mfg.
592	1,214	1.02	.99	2.01	Machine tools, mfg.
860	1,707	1.26	1.29	2.55	Machinery (specialties), mfg.
567	1,069	1.23	1.38	2.61	Machinery mfg.
1,166	2,529	1.53	1.32	2.85	Machine tools, mfg.
980	2,000	1.68	1.62	3.30	Machine tools, mfg
2,396	4,840	1.68	1.65	3.33	Electrical machinery, mfg.
1,982	4,128	1.80	1.65	3.45	Machine tools, mfg.
815	1,601	2.55	2.64	5.19	Machine tools, mfg.
1,989	4,019	1.77	1.74	3.51	Engineering specialties, mfg.
903	1,954	2.52	2.16	4.68	Office appliances
1,109	2,247	2.58	2.52	5.10	F'dry (stoves and furn's), mfg.
1,969	3,819	3.51	3.72	6.23	Tin can mfg.
119	201	.33	.48	.81	Printing and publishing(books)
811	1,478	.87	1.05	1.92	Printing and publishing (misc.)
2,228	4,440	3.60	3.60	7.20	Printing and publishing (etc.)
382	743	.51	.54	1.05	Public utilities: Gas and elec.
714	1,491	.45	.39	.84	Tel. service
847	1,483	.48	.63	1.11	Street rys.[14]
29,704	60,621	1.65	1.59	3.24	Total
		CLEVELAND[c]			
2,878	6,430	.81	.63	1.44	Auto. and motor truck mfg.[15]
2,923	5,566	1.86	2.07	3.93	Auto. and motor truck mfg.
6,289	11,468	2.37	2.88	5.25	Auto. and motor truck mfg.
1,038	2,054	2.94	3.03	5.97	Street railway cars, mfg.
1,540	3,286	4.56	4.02	8.58	Tractors, mfg.[16]
2,332	4,612	4.41	4.50	8.91	Auto. parts, mfg.[17]
4,152	8,636	5.82	5.40	11.22	Auto. frames, steel stampings[18]
548	1,116	2.13	2.04	4.17	Paint and varnish mfg.
5,589	11,664	3.06	2.82	5.88	Storage batteries, mfg.
376	700	3.09	3.57	6.66	Paint and varnish mfg.
5,789	11,825	3.75	3.60	7.35	Storage batteries, carbon [11]
1,129	2,740	1.14	.78	1.92	Clothing, women's, mfg.
3,698	7,076	3.36	3.69	7.05	Bags (paper and cloth), mfg.
4,566	7,976	2.25	3.03	5.28	Woodw'k, sewing cabinets [19]
3,037	6,547	1.44	1.26	2.70	Automatic screw-mach'ry,mfg.
1,338	2,913	1.59	1.35	2.94	Machinery (heavy), mfg.
2,556	6,076	2.79	2.01	4.80	Machine tools, mfg.
2,393	5,084	2.85	2.55	5.40	Machinery (heavy), mfg.
278	558	2.85	2.85	5.70	Molding machinery, mfg.[20]
3,234	6,782	4.08	3.72	7.80	Motors, mfg.[21]

TABLE

LABOR MOBILITY IN 1917–

INDUSTRY OR NATURE OF BUSINESS	ESTABLISHMENT NUMBER *	NUMBER OF FULL-YEAR WORKERS	LABOR HOURS (THOUSANDS)	ACCESSIONS
				CLEVELAND [c] —
Metal wire, etc., mfg.	176	917	2,751	1,286
Steel works [22]	177	3,124	9,372	5,004
Metal wire, etc., mfg.	178 (41)	699	2,097	1,510
Sewing machines, mfg.	179	590	1,770	1,281
Electrical appliances, mfg.	180	393	1,179	941
Steel works	181	1,031	3,093	2,887
Oil stoves, mfg.	182 (42)	1,649	4,947	5,118
Malleable iron castings	183	937	2,811	3,077
Metal wire, etc., mfg.	184 (41)	709	2,127	2,392
Forgings	185	2,712	8,136	9,313
Steel works [10]	186	2,222	6,666	14,734
Printing and publishing (book and job)	187	163	489	225
Printing and publishing (job)	188	149	447	247
Public utilities: Gas (clerical force)	189	304	912	219
Gas mfg.	190	753	2,259	674
Tel. serv. (cler. force)	191	102	306	132
Tel. serv. (op. force)	192	1,368	4,104	2,328
Tel. serv. (pl'nt dept.)	193	1,267	3,801	2,200
Total	[38]	43,654	130,962	110,994
				DETROIT
Automobile mfg.[23]	194 (48)	31,950	95,850	14,924
Automobile parts, mfg.	195	783	2,349	1,629
Automobile mfg.	196	6,337	19,011	16,696
Automobile parts, mfg.[24]	197	850	2,550	2,427
Automobile mfg.	198 (50)	2,504	7,512	7,683
Automobile parts, mfg.	199	224	672	800
Automobile mfg.	200 (51)	9,869	29,607	34,779
Automobile parts, mfg.	201	86	258	301
Automobile mfg.	202	1,944	5,832	7,332
Automobile parts, mfg.	203	114	342	433
Automobile mfg.	204	135	405	477
Automobile mfg.[23]	205 (47)	11,125	33,375	41,174
Automobile parts, mfg.[25]	206	2,574	7,722	11,578
Automobile parts, mfg.	207 (54)	3,379	10,137	15,296
Automobile mfg.[16]	208	416	1,248	1,614
Automobile mfg.	209	121	363	606
Automobile parts, mfg.[18]	210	314	942	1,574

A — *Continued*

INDIVIDUAL ESTABLISHMENTS
18°

LABOR CHANGES					
NUMBER		RATE PER FULL-YEAR WORKER			INDUSTRY OR NATURE OF BUSINESS
SEPARATIONS	TOTAL	ACCESSION	SEPARATION	FLUX	
Continued					
1,386	2,672	1.41	1.50	2.91	Metal wire, etc., mfg.
4,956	9,960	1.59	1.59	3.18	Steel works [22]
1,520	3,030	2.16	2.16	4.32	Metal wire, etc., mfg.
1,290	2,571	2.16	2.19	4.35	Sewing machines, mfg.
776	1,717	2.40	1.98	4.38	Electrical appliances, mfg.
2,841	5,728	2.79	2.76	5.55	Steel works
5,081	10,199	3.09	3.09	6.18	Oil stoves, mfg.
3,091	6,168	3.27	3.30	6.57	Malleable iron castings
2,334	4,726	3.36	3.30	6.66	Metal wire, etc., mfg.
9,630	18,943	3.42	3.54	6.96	Forgings
13,050	27,784	6.63	5.88	12.51	Steel works [10]
265	490	1.38	1.62	3.00	Prin'g & pub'sh'g (book & job)
232	479	1.65	1.56	3.21	Printing and publishing (job)
158	377	.72	.51	1.23	Pub. utilities: Gas (cler. force)
573	1,247	.90	.75	1.65	Gas mfg.
140	272	1.29	1.38	2.67	Tel.serv.(cl. f'rc)
2,262	4,590	1.71	1.65	3.36	Tel.serv.(op. f'e)
2,889	5,089	1.74	2.28	4.02	Tel.serv.(pl't d't)
108,157	219,151	2.55	2.49	5.04	Total
		DETROIT			
14,631	29,555	.48	.45	.93	Automobile mfg.[23]
2,123	3,752	2.07	2.70	4.77	Automobile parts, mfg.
17,048	33,744	2.64	2.70	5.34	Automobile mfg.
2,267	4,694	2.85	2.67	5.52	Automobile parts, mfg.[24]
6,861	14,544	3.06	2.73	5.79	Automobile mfg.
670	1,470	3.57	3.00	6.57	Automobile parts, mfg.
30,191	64,970	3.51	3.06	6.57	Automobile mfg.
298	599	3.51	3.48	6.99	Automobile parts, mfg.
6,787	14,119	3.78	3.48	7.26	Automobile mfg.
423	856	3.81	3.72	7.53	Automobile parts, mfg.
537	1,014	3.54	3.99	7.53	Automobile mfg.
45,808	86,982	3.69	4.11	7.80	Automobile mfg.[23]
9,120	20,698	4.50	3.54	8.04	Automobile parts, mfg.[25]
15,130	30,426	4.53	4.47	9.00	Automobile parts, mfg.
1,744	3,358	3.87	4.20	8.07	Automobile mfg.[16]
613	1,219	5.01	5.07	10.08	Automobile mfg.
1,680	3,254	5.01	5.34	10.35	Automobile parts, mfg.[18]

TABLE

LABOR MOBILITY IN 1917–

INDUSTRY OR NATURE OF BUSINESS	ESTABLISHMENT NUMBER *	NUMBER OF FULL-YEAR WORKERS	LABOR HOURS (THOUSANDS)	ACCESSIONS
				DETROIT—
Automobile parts, mfg.	211	1,103	3,309	6,044
Automobile parts, mfg.[18]	212	814	2,442	6,798
Coke and chemicals, mfg.[9]	213	2,925	8,775	2,332
Chemicals and drugs, mfg.[9]	214	668	2,004	1,037
Paints, mfg.[26]	215	434	1,302	821
Clothing and overalls, mfg.	216	480	1,440	686
Furniture mfg.	217	511	1,533	1,642
Machine tools, mfg.	218	630	1,890	1,773
Machine tools, mfg.[27]	219	585	1,755	2,472
Steam engine, etc., mfg.	220	726	2,178	3,591
Iron and steel (small parts), mfg.	221	218	654	392
Heating devices, mfg.	222	497	1,491	834
Iron and steel castings, mfg.	223	675	2,025	1,437
Electrical appliances, mfg.	224	159	477	377
Steel forgings	225	316	948	910
Heating devices, mfg.[9]	226	637	1,911	1,781
Steel castings	227	390	1,170	1,296
Structural steel, mfg.	228	161	483	543
Electrical appliances, mfg.	229	213	639	744
Steel forging	230	241	723	968
Screw-machine products, mfg.	231	187	561	821
Screw-machine products, mfg.	232	438	1,314	1,967
Machine appurt nances, mfg.[28]	233	540	1,620	2,832
Machine appurtenances, mfg.[18]	234	391	1,173	2,292
Public utilities:				
Gas mfg.	235	1,933	5,799	1,585
Telephone service (Comm. dept).	236	161	483	104
Telephone service (Clerical force)	237	138	414	167
Telephone service (Installation)	238	431	1,293	533
Telephone service (Traffic dept.)	239	2,167	6,501	3,347
Telephone service (Construction)	240	331	993	628
Slaughtering and meat packing	241	456	1,368	1,851
Total	[48]	92,281	276,843	211,928

A — *Continued*

INDIVIDUAL ESTABLISHMENTS
81 °

LABOR CHANGES					
NUMBER		RATE PER FULL-YEAR WORKER			INDUSTRY OR NATURE OF BUSINESS
SEPARATIONS	TOTAL	ACCESSION	SEPARATION	FLUX	
Continued					
5,795	11,839	5.49	5.25	10.74	Automobile parts, mfg.
6,534	13,332	8.34	8.04	16.38	Automobile parts, mfg.[18]
2,527	4,859	.81	.87	1.68	Coke and chemicals, mfg.[9]
1,131	2,168	1.56	1.68	3.24	Chemicals and drugs, mfg.[9]
757	1,578	1.89	1.74	3.63	Paints, mfg.[26]
978	1,664	1.44	2.04	3.48	Clothing and overalls, mfg.
1,765	3,407	3.21	3.45	6.66	Furniture mfg.
1,433	3,206	2.82	2.28	5.10	Machine tools, mfg.
2,418	4,890	4.23	4.14	8.37	Machine tools, mfg.[27]
3,584	7,175	4.95	4.95	9.90	Steam engine, etc., mfg.
384	776	1.80	1.77	3.57	Iron and steel (small p'ts), mfg.
1,167	2,001	1.68	2.34	4.02	Heating devices, mfg.
1,642	3,079	2.13	2.43	4.56	Iron and steel castings, mfg.
391	768	2.37	2.46	4.83	Electrical appliances, mfg.
695	1,605	2.88	2.19	5.07	Steel forgings
1,714	3,495	2.79	2.70	5.49	Heating devices, mfg.[9]
1,066	2,362	3.33	2.73	6.06	Steel castings
567	1,110	3.36	3.51	6.87	Structural steel, mfg.
744	1,488	3.48	3.48	6.96	Electrical appliances, mfg.
899	1,867	4.02	3.72	7.74	Steel forging
710	1,531	4.38	3.81	8.19	Screw-machine products, mfg.
2,057	4,024	4.50	4.71	9.21	Screw-machine products, mfg.
2,712	5,544	5.25	5.01	10.26	Machine appurtenances, mfg.[28]
2,208	4,500	5.85	5.64	11.49	Machine appurtenances, mfg.[18]
					Public utilities:
1,040	2,625	.81	.54	1.35	Gas mfg.
106	210	.66	.66	1.32	Tel. serv. (Comm. dept.)
141	308	1.20	1.02	2.22	Tel. serv. (Clerical force)
510	1,043	1.23	1.17	2.40	Tel. serv. (Installation)
3,015	6,362	1.56	1.38	2.94	Tel. serv. (Traffic dept.)
633	1,261	1.89	1.92	3.81	Tel. serv. (Construction)
1,874	3,725	4.05	4.11	8.16	Slaughtering and meat packing
207,128	419,056	2.31	2.25	4.56	Total

TABLE

LABOR MOBILITY IN 1917–

INDUSTRY OR NATURE OF BUSINESS	ESTABLISHMENT NUMBER *	NUMBER OF FULL-YEAR WORKERS	LABOR HOURS (THOUSANDS)	ACCESSIONS
		MILWAUKEE†		
Motor vehicles and parts, mfg.	242	1,665	4,995	2,435
Automobile parts, mfg.	243	1,246	3,738	4,157
Chemicals, mfg.[10]	244	346	1,038	470
Chemicals, mfg.[10]	245	876	2,628	5,660
Textiles, mfg.[10]	246	820	2,460	790
Textiles, mfg.[21]	247	468	1,404	950
Leather, mfg.	248	3,168	9,504	6,228
Rubber goods, mfg.	249	1,275	3,825	4,859
Machinery (heavy), mfg.	250	638	1,914	931
Machinery (heavy) mfg.	251	4,732	14,196	6,374
Machinery (heavy), mfg.	252	524	1,572	704
Machinery (heavy), mfg.[21]	253	998	2,994	2,093
Machinery (heavy), mfg.	254	1,300	3,900	2,634
Heating devices, mfg.	255	238	714	165
Electrical appliances, mfg.	256	464	1,392	574
Electrical appliances, mfg.[22]	257 (58)	1,181	3,543	3,050
Castings, mfg.[29]	258	542	1,626	1,496
Household metal ware, mfg.[10]	259	540	1,620	1,608
Household metal ware, mfg.[27]	260	1,163	3,489	6,945
Public utilities: Gas mfg.	261	839	2,517	1,713
Street railways, etc.[30]	262	3,643	10,929	3,058
Total	[21]	26,666	79,998	56,894
		SAN FRANCISCO		
Oil refinery	263	421	1,263	1,141
Sugar refinery[31]	264	1,259	3,777	3,566
Explosives, mfg.[32]	265	1,795	5,385	10,818
Machinery, mfg.[11]	266	173	519	261
Agricultural implements, mfg.[10]	267	2,224	6,672	4,912
Structural iron and steel, mfg.[33]	268	500	1,500	860
Mercantile, establishment[11]	269	85	255	138
Mercantile, establishment[34]	270	244	732	435
Mercantile, establishment[35]	271	899	2,697	1,674
Structural iron and steel, mfg.	272	669	2,007	2,904
Gas and electricity (Main office)	273	308	924	174
Gas and electricity (Metrop. Dis.)[33]	274	1,173	3,519	1,254
Gas and elec. (Country Dists.)[33]	275	3,424	10,272	8,205
Street railways, etc.	276	1,046	3,138	1,167
Total	[14]	14,220	42,660	37,509

A — *Continued*

INDIVIDUAL ESTABLISHMENTS

18°

LABOR CHANGES					INDUSTRY OR NATURE OF BUSINESS
NUMBER		RATE PER FULL-YEAR WORKER			
SEPARATIONS	TOTAL	ACCESSION	SEPARATION	FLUX	
		MILWAUKEE[f]			
2,748	5,183	1.47	1.65	3.12	Motor vehicles and parts, mfg.
3,677	7,834	3.33	2.94	6.27	Automobile parts, mfg.
610	1,080	1.35	1.77	3.12	Chemicals, mfg.[10]
3,742	9,402	6.45	4.26	10.71	Chemicals, mfg.[10]
774	1,564	.96	.93	1.89	Textiles, mfg.[10]
859	1,809	2.04	1.83	3.87	Textiles, mfg.[21]
6,618	12,846	1.98	2.10	4.08	Leather, mfg.
4,589	9,448	3.81	3.60	7.41	Rubber goods, mfg.
803	1,734	1.47	1.26	2.73	Machinery (heavy), mfg.
6,699	13,073	1.35	1.41	2.76	Machinery (heavy) mfg.
780	1,484	1.35	1.50	2.85	Machinery (heavy), mfg.
2,100	4,193	2.10	2.10	4.20	Machinery (heavy), mfg.[21]
3,083	5,717	2.04	2.37	4.41	Machinery (heavy), mfg.
219	384	.69	.93	1.62	Heating devices, mfg.
450	1,024	1.23	.96	2.19	Electrical appliances, mfg.
2,932	5,982	2.58	2.49	5.07	Electrical appliances, mfg.[29]
1,470	2,966	2.76	2.70	5.46	Castings, mfg.[29]
1,662	3,270	2.97	3.06	6.03	Household metal ware, mfg.[10]
7,026	13,971	5.97	6.03	12.00	Household metal ware, mfg.[27]
1,561	3,274	2.04	1.86	3.90	Public utilities: Gas mfg.
3,728	6,786	.84	1.02	1.86	Str't rys., etc.[30]
56,130	113,024	2.13	2.10	4.23	Total
BAY REGION[g]					
980	2,121	2.70	2.34	5.04	Oil refinery
3,011	6,577	2.82	2.40	5.22	Sugar refinery[31]
7,800	18,618	6.03	4.35	10.38	Explosives, mfg.[32]
362	623	1.50	2.10	3.60	Machinery, mfg.[11]
5,338	10,250	2.22	2.40	4.62	Agricul. implements, mfg.[10]
1,022	1,882	1.71	2.04	3.75	Structural iron and steel, mfg.[33]
121	259	1.62	1.41	3.03	Mercantile, establishment[11]
409	844	1.77	1.68	3.45	Mercantile, establishment[34]
1,568	3,242	1.86	1.74	3.60	Mercantile, establishment[35]
2,875	5,779	4.35	4.29	8.64	Structural iron and steel, mfg.
201	375	.57	.66	1.23	Gas and electricity (Main ofc.)
1,656	2,910	1.08	1.41	2.49	Gas and elec. (Metr. Dis.)[33]
8,556	16,761	2.40	2.49	4.89	Gas & el. (Coun'y Dists.)[33]
1,239	2,406	1.11	1.20	2.31	Street railways, etc.
35,138	72,647	2.64	2.46	5.10	Total

NOTES TO TABLE A

° Unless it is otherwise specified, the figures for 1913–14 refer to the year ended June 30, 1914, and the figures for 1917–18 refer to the year ended May 31, 1918.

* Figures in parentheses are the 1917–18 numbers of such concerns as were reported in 1917–18 as well as 1913–14.

† Each of the two mills which constitute this establishment was reported as a separate concern in 1917–18.

a. This group of plants reported in a special article, "Labor Turnover in Chicago," 9 *Monthly Labor Review*, 652–667 (September, 1919).

b. This group of plants reported in a special article, "Labor Turnover in Cincinnati," 8 *Monthly Labor Review*, 651–668 (March, 1919).

c. This group of plants, together with those in Detroit, reported in a special article, "Labor Turnover in Cleveland and Detroit," 8 *Monthly Labor Review*, 11–30 (January, 1919).

d. This concern reported in detail in a special article, "Labor Turnover and Employment Policies of a Large Motor Vehicle Manufacturing Establishment," 7 *Monthly Labor Review*, 837–855 (October, 1918).

e. The figures shown here are based upon the records of five individual establishments. They were secured in connection with another investigation carried on simultaneously in the cloak and suit industry of Cleveland. The results of this investigation were published in the *Monthly Labor Review* for August, 1918.

f. This group of plants reported in a special article, "Labor Turnover in Milwaukee," 8 *Monthly Labor Review*, 999–1016 (April, 1919).

g. This group of plants reported in a special article, "Labor Turnover in the San Francisco Bay Region," 8 *Monthly Labor Review*, 303–380 (February, 1919).

h. This concern reported, with another oil refinery, in detail in a special article, "Labor Policies and Labor Turnover in the California Oil Refining Industry," 8 *Monthly Labor Review*, 969–998 (April, 1919).

i. This concern reported in detail in a special article, "Employment Policies and Labor Mobility in a California Sugar Refinery," 9 *Monthly Labor Review*, 1802–1824 (December, 1919).

[1] Calendar year 1913.
[2] Not including special employees averaging 181 during the year.
[3] Including student operators.
[4] For nine months' period ended September 30, 1914.
[5] Calendar year 1915.
[6] Year ended November 30, 1914.
[7] Year ended October 31, 1915.
[8] Calendar year 1912.
[9] Year ended June 30, 1918.
[10] Six months' period ended June 30, 1918.
[11] Year ended April 30, 1918.
[12] Ten months' period ended June 30, 1918.
[13] Eight months' period ended June 30, 1918.
[14] Figures cover conductors and motormen only.
[15] Year ended March 31, 1918.
[16] Ten months' period ended May 31, 1918.
[17] Eight months' period ended May 31, 1918.
[18] Six months' period ended July 31, 1918.
[19] Period from August 20, 1917, to July 7, 1918, inclusive.
[20] Six months' period ended May 31, 1918.
[21] Seven months' period ended May 31, 1918.
[22] Nine months' period ended May 31, 1918.
[23] Year ended July 31, 1918.
[24] Year ended January 31, 1918.
[25] For 9½ months ended August 12, 1918.
[26] For 8½ months ended August 15, 1918.
[27] Eight months' period ended August 31, 1918.
[28] For 7½ months ended August 15, 1918.
[29] Six months period ended August 31, 1918.
[30] Year ended August 31, 1918.
[31] Not including employees hired in one department, which had about 125 employees.
[32] Six months' period ended June 26, 1918.
[33] Year ended May 15, 1918.
[34] Year ended May 2, 1918.
[35] Year ended October 31, 1918.

TABLE

TYPE OF SEPARATION (DISCHARGE, LAY-OFF, ENTRY INTO MILITARY SERVICE, OR
1913–14 AND
1913–

INDUSTRY OR NATURE OF BUSINESS	ESTABLISHMENT NUMBER	NUMBER OF WORKERS	NUMBER	
			EMPLOYEES LEAVING	
			WERE DISCHARGED	WERE LAID OFF
	BOSTON			
Railroad shops	2	2,001	73	39
Rubber footwear and auto tires	4	2,856	975	—
Shoe machinery, mfg.	6	2,549	694	—
Department store	7	1,839	114	307
Steam gauges and valves, mfg.	8	167	33	25
Plumbing tools, mfg.	9	212	117	—
Brass valves and fittings, mfg.	10	899	353	40
Paper products and roofing material	11	864	95	252
Paper boxes and shipping tags, etc.	12	1,749	132	—
Color printing, etc.	13	726	82	29
Book mfg.	14	449	23	80
Public utilities: Street railways	15	3,060	171	—
Elevated railways	16	8,858	582	—
Telephone service	17	2,750	131	14
Total	[14]	28,979	3,575	786
	CHICAGO			
Chewing gum, mfg.	18	273	12	82
Shoe bottoms, mfg.	19	277	9	21
Agricultural implements, mfg.	20	4,377	248	1,362
Agricultural implements, mfg.	21	6,592	261	2,265
Agricultural implements, mfg.	22	1,904	29	654
Agricultural implements, mfg.	23	761	45	—
Structural steel	26	243	58	69
Electrical supplies, mfg.	28	544	136	249
Valves and fittings, mfg.	29	4,306	280	27
Iron wheels and castings, mfg.	30	415	64	42
Steel products, mfg.	31	3,758	87	—
Telephone apparatus, mfg.	32	11,049	619	2,090
Total	[12]	34,499	1,848	6,861
	CINCINNATI			
Engineering specialties, mfg.	37	656	119	—

B

VOLUNTARY QUITTING) IN INDIVIDUAL ESTABLISHMENTS AND SPECIFIED CITIES, 1917–18

14

OF		PER CENT			
DURING THE YEAR WHO		EMPLOYEES LEAVING DURING THE YEAR WHO			INDUSTRY OR NATURE OF BUSINESS
LEFT VOLUNTARILY	TOTAL	WERE DISCHARGED	WERE LAID OFF	LEFT VOLUNTARILY	
		BOSTON			
536	648	11	6	83	Railroad shops
1,826	2,801	35	—	65	Rubber footwear and auto tires
731	1,425	49	—	51	Shoe machinery, mfg.
421	812	14	37	50	Department store
72	130	25	19	55	Steam gauges and valves, mfg.
310	427	37	—	73	Plumbing tools, mfg.
558	951	37	4	59	Brass valves and fittings, mfg.
158	505	19	50	31	Paper products and roofing
877	1,009	13	—	87	Paper boxes and shipping tags
262	373	22	8	70	Color printing, etc.
47	150	15	53	31	Book mfg.
241	412	42	—	59	Public utilities: Street railw's
582	1,164	50	—	50	Elev. railw's
321	466	28	3	69	Teleph. serv.
6,942	11,303	32	7	61	Total
		CHICAGO			
235	329	4	25	71	Chewing gum, mfg.
176	206	4	10	86	Shoe bottoms, mfg.
1,198	2,808	9	48	42	Agricultural implem's, mfg.
1,589	4,115	6	55	39	Agricultural implem's, mfg.
309	992	3	66	31	Agricultural implem's, mfg.
733	778	6	—	94	Agricultural implem's, mfg.
85	212	27	33	40	Structural steel
315	700	19	36	45	Electrical supplies, mfg.
581	888	32	3	65	Valves and fittings, mfg.
500	606	11	7	83	Iron wheels and castings, mfg.
2,968	3,055	3	—	97	Steel products, mfg.
13,454	16,163	4	13	83	Telephone apparatus, mfg.
22,143	30,852	6	22	72	Total
		CINCINNATI			
164	283	42	—	58	Engineering specialties, mfg.

TABLE

TYPE OF SEPARATION (DISCHARGE, LAY-OFF, ENTRY INTO MILITARY SERVICE, OR 1913–14 AND 1913–

INDUSTRY OR NATURE OF BUSINESS	ESTABLISHMENT NUMBER	NUMBER OF WORKERS	NUMBER: EMPLOYEES LEAVING: WERE DISCHARGED	NUMBER: EMPLOYEES LEAVING: WERE LAID OFF
CLEVELAND				
Clothing, mfg.	38	1,020	189	—
Clothing, men's, mfg.	39	783	100	—
Machine tools, mfg.	40	335	90	—
Metal wire, etc., mfg.	41	1,247	70	88
Machine tools, mfg.	42	1,111	216	990
Total	[5]	4,496	665	1,078
DETROIT				
Aluminum and brass foundry	43	397	621	1,191
Motor car, mfg.	44	2,146	1,317	668
Motor car, gasoline, mfg.	45	715	829	550
Transmissions and gears, mfg.	46	239	209	69
Motor car, mfg.	47	3,110	1,460	3,883
Motor car, mfg.	48	10,904	926	383
Motor car, mfg.	49	731	364	126
Motor car, mfg.	50	897	551	435
Motor car, mfg.	51	4,028	740	—
Motor car, mfg.	52	287	409	298
Motor car, mfg.	53	4,484	2,279	9,325
Automobile parts, mfg.	54	1,004	1,051	—
Adding machines, mfg.	55	1,887	729	14
Public utilities: gas mfg.	56	650	42	27
Total	[14]	31,479	11,527	16,969
NEW YORK				
Crackers and biscuits, baking	59	1,111	206	60
Cotton specialties, mfg.	60	785	158	58
Printing presses, mfg.	61	1,438	356	195
Mail order house	62	624	73	465
Life insurance	63	3,679	33	—
Paper products, mfg.	65	1,778	525	154
Public utilities: Street railways	66	3,622	1,796	—
Telephone service	67	19,051	1,582	3,910
Total	[8]	32,088	4,729	4,842

B — *Continued*

VOLUNTARY QUITTING) IN INDIVIDUAL ESTABLISHMENTS AND SPECIFIED CITIES, 1917–18

14

OF		PER CENT			
DURING THE YEAR WHO		EMPLOYEES LEAVING DURING THE YEAR WHO			INDUSTRY OR NATURE OF BUSINESS
LEFT VOLUNTARILY	TOTAL	WERE DISCHARGED	WERE LAID OFF	LEFT VOLUNTARILY	
		CLEVELAND			
265	454	42	—	58	Clothing, mfg.
330	430	23	—	77	Clothing, men's, mfg.
180	270	33	—	67	Machine tools, mfg.
718	876	8	10	82	Metal wire, etc., mfg.
619	1,825	12	54	34	Machine tools, mfg.
2,112	3,855	17	28	55	Total
		DETROIT			
333	2,145	29	56	16	Aluminum and brass foundry
3,270	5,255	25	13	62	Motor car, mfg.
330	1,709	49	32	19	Motor car, gasoline, mfg.
254	532	39	13	48	Transmissions and gears, mfg.
3,286	8,629	17	45	38	Motor car, mfg.
5,199	6,508	14	6	80	Motor car, mfg.
611	1,101	33	11	55	Motor car, mfg.
425	1,411	39	31	30	Motor car, mfg.
2,155	2,895	26	—	74	Motor car, mfg.
643	1,350	30	22	48	Motor car, mfg.
1,652	13,256	17	70	12	Motor car, mfg.
867	1,918	55	—	45	Automobile parts, mfg.
840	1,583	46	1	53	Adding machines, mfg.
133	202	21	13	66	Public utilities: gas mfg.
19,998	48,494	24	35	41	Total
		NEW YORK			
129	1,395	15	4	81	Crackers and biscuits, baking
839	1,055	15	5	80	Cotton specialties, mfg.
666	1,217	29	16	55	Printing presses, mfg.
398	936	50	8	43	Mail order house
233	266	12	—	88	Life insurance
963	1,642	32	9	59	Paper products, mfg.
974	2,770	65	—	35	Public utilities: Street railw's
4,828	10,320	15	38	47	Tel. service
10,030	19,601	24	25	51	Total

TABLE

TYPE OF SEPARATION (DISCHARGE, LAY-OFF, ENTRY INTO MILITARY SERVICE, OR
1913–14 AND

1913–

INDUSTRY OR NATURE OF BUSINESS	ESTABLISHMENT NUMBER	NUMBER OF WORKERS	NUMBER	
			EMPLOYEES LEAVING	
			WERE DISCHARGED	WERE LAID OFF
				OTHER
Rubber goods, mfg.	68	5,346	901	806
Rubber tires, mfg.	69	639	181	95
Sheet metal ware, mfg.	70	564	94	452
Lighting apparatus, mfg.	72	1,087	177	765
Cash registers, mfg.	73	5,034	271	574
Insurance	75	971	23	—
Typewriters, mfg.	76	2,894	110	12
Automobile, mfg.	78	477	1,006	399
Agricultural implements, mfg.	79	517	33	458
Electrical apparatus, mfg.	81	10,665	4,504 [1]	—
Bleaching and dyeing	82	1,516	297	220
Machine tool, mfg.	83	4,323	850	103
Total	[12]	33,933	8,447	3,884

[1] Includes number

B — *Continued*

VOLUNTARY QUITTING) IN INIDVIDUAL ESTABLISHMENTS AND SPECIFIED CITIES, 1917–18

14

OF		PER CENT			
DURING THE YEAR WHO		EMPLOYEES LEAVING DURING THE YEAR WHO			INDUSTRY OR NATURE OF BUSINESS
LEFT VOLUNTARILY	TOTAL	WERE DISCHARGED	WERE LAID OFF	LEFT VOLUNTARILY	
CITIES					
6,363	8,070	11	10	79	Rubber goods, mfg.
752	1,028	18	9	73	Rubber tires, mfg.
526	1,072	9	42	49	Sheet metal ware, mfg.
121	1,063	17	72	11	Lighting apparatus, mfg.
2,606	3,451	8	17	76	Cash registers, mfg.
270	293	8	—	92	Insurance
826	948	12	1	87	Typewriters, mfg.
2,019	3,424	29	12	59	Automobile, mfg.
356	847	4	54	42	Agricul. implements, mfg.
12,244	16,748	27	—	73	Electrical apparatus, mfg.
783	1,300	23	17	60	Bleaching and dyeing
2,322	3,275	26	3	71	Machine tool, mfg.
29,188	41,519	20	9	70	Total

laid off.

TABLE

TYPE OF SEPARATION (DISCHARGE, LAY-OFF, ENTRY INTO MILITARY SERVICE, OR 1913–14 AND 1917–

INDUSTRY OR NATURE OF BUSINESS	ESTABLISHMENT NUMBER	NUMBER OF WORKERS	NUMBER		
			EMPLOYEES LEAVING DURING		
			WERE DISCHARGED	WERE LAID OFF	ENTERED MILITARY SERVICE
	CHICAGO				
Printing presses, mfg.	104	764	12	60	45
Agricultural implem'ts, mfg.	105	4,211	211	226	224
Agricultural implem'ts, mfg.	106	5,759	481	596	387
Machinery (coal mining), mfg.	107	611	13	199	61
Mail order house	110	1,042	151	—	162
Mail order house	112	5,092	558	3,441	322
Structural steel, mfg.	113	402	42	—	12
Brass and metal specialties, mfg.	114	283	12	—	34
Iron wheels and castings, mfg.	115	390	48	8	44
Office appliances, mfg.	116	667	431	—	84
Electrical supplies, mfg.	117	733	329	112	116
Iron castings, mfg.	118	950	353	—	108
Screw machine products, mfg.	119	520	83	—	94
Steel forgings, mfg.	120	1,099	340	48	250
Electrical supplies, mfg.	121	258	171	35	60
Public utilities: Electricity	122	4,728	500	358	1,064
Telephone serv	124	13,604	2,191	1,718	903
Street railways	125	3,909	1,109	—	524
Slaughtering and meat packing	126	8,730	7,925	659	484
Slaughtering and meat packing	127	14,320	7,372	2,064	612
Slaughtering and meat packing	128	5,219	2,644	1,292	504
Total	[21]	73,291	24,976	10,816	6,094

B — *Continued*

VOLUNTARY QUITTING) IN INDIVIDUAL ESTABLISHMENTS AND SPECIFIED CITIES, 1917–18

18

OF THE YEAR WHO		PER CENT EMPLOYEES LEAVING DURING THE YEAR WHO				INDUSTRY OR NATURE OF BUSINESS
LEFT VOLUNTARILY	TOTAL	WERE DISCHARGED	WERE LAID OFF	ENTERED MILITARY SERVICE	LEFT VOLUNTARILY	
		CHICAGO				
354	471	2	13	10	75	Printing presses, mfg.
2,301	2,962	7	7	8	78	Agricul. implem'ts, mfg.
3,265	4,729	10	13	8	69	Agricul. implem'ts, mfg.
491	764	2	26	8	64	Mach'ry (coal min'g), mfg.
1,019	1,332	11	—	12	77	Mail order house
8,012	12,333	4	29	3	64	Mail order house
316	370	11	—	3	85	Structural steel, mfg.
490	536	2	—	6	92	Brass and metal spec's, mfg.
758	858	6	1	5	88	Iron wheels & cast'gs, mfg.
1,197	1,712	25	—	5	70	Office appliances, mfg.
1,408	1,965	17	6	6	71	Electrical supplies, mfg.
2,306	2,767	13	—	4	83	Iron castings, mfg.
1,504	1,681	5	—	6	89	Screw mach. products, mfg.
2,096	2,734	12	2	9	77	Steel forgings, mfg.
602	868	20	4	7	69	Electrical supplies, mfg.
4,312	6,234	8	6	17	69	Public utilities: Electricity
6,642	11,454	19	15	8	58	Tel. serv.
2,176	3,809	29	—	14	57	Street rys.
6,994	16,062	49	4	3	44	Slaugh'g and meat packing
17,842	27,890	27	7	2	64	Slaugh'g and meat packing
12,978	17,418	15	7	3	75	Slaugh'g and meat packing
77,063	118,949	21	9	5	65	Total

TABLE

TYPE OF SEPARATION (DISCHARGE, LAY-OFF, ENTRY INTO MILITARY SERVICE, OR 1913–14 AND 1917–

INDUSTRY OR NATURE OF BUSINESS	ESTABLISHMENT NUMBER	NUMBER OF WORKERS	NUMBER: EMPLOYEES LEAVING DURING		
			WERE DISCHARGED	WERE LAID OFF	ENTERED MILITARY SERVICE
			CINCINNATI		
Textile (cotton) mfg.	133	330	15	—	10
Millwork (building material)	134	275	26	—	30
Machine tools, mfg.	137	127	17	—	7
Machine tools, mfg.	138	602	76	—	110
Machinery specialties, mfg.	139	669	107	—	80
Machinery mfg.	140	407	85	—	21
Machine tools, mfg.	141	883	116	10	110
Machine tools, mfg.	142	602	193	—	64
Machine tools, mfg.	144	1,194	261	—	130
Office appliances, mfg.	147	418	228	11	76
Foundry (stoves and furnaces)	148	440	98	18	33
Printing and publishing (books)	150	244	2	1	18
Printing and publishing (misc.)	151	767	24	—	35
Printing and publishing	152	617	64	—	105
Telephone service	154	1,769	74	40	64
Trainmen, street railways	155	1,330	128	—	77
Total	[16]	10,674	1,514	80	970
			CLEVELAND		
Automobile and motor truck mfg.	156	4,456	156	22	529
Automobile and motor truck mfg.	157	1,417	188	6	66
Automobile and motor truck mfg.	158	2,173	1,095	470	274
Tractor mfg.	160	384	200	664	158
Paint and varnish mfg.	163	267	50	—	20
Storage batteries, mfg.	164	1,987	429	406	315
Storage batteries, carbon prod.	166	1,610	763	—	57
Machinery (heavy) mfg.	173	940	58	15	166
Motors, mfg.	175	870	573	288	123
Metal wire, etc., mfg.	176	917	11	26	42
Metal wire, etc., mfg.	178	699	96	18	79
Sewing machines, mfg.	179	590	84	—	45
Oil stoves, mfg.	182	1,649	275	118	200
Metal wire, etc., mfg.	184	709	206	45	156
Telephone service (Clerical)	191	102	23	—	9
Telephone service (Operation)	192	1,368	353	1	2
Telephone service (Plant)	193	1,267	20	513	147
Total	[17]	21,405	4,580	2,592	2,388

[1] Less than ½

B — *Continued*

VOLUNTARY QUITTING) IN INDIVIDUAL ESTABLISHMENTS AND SPECIFIED CITIES, 1917–18

18

OF THE YEAR WHO LEFT VOLUNTARILY	OF THE YEAR WHO TOTAL	PER CENT EMPLOYEES LEAVING DURING THE YEAR WHO WERE DISCHARGED	PER CENT EMPLOYEES LEAVING DURING THE YEAR WHO WERE LAID OFF	PER CENT EMPLOYEES LEAVING DURING THE YEAR WHO ENTERED MILITARY SERVICE	PER CENT EMPLOYEES LEAVING DURING THE YEAR WHO LEFT VOLUNTARILY	INDUSTRY OR NATURE OF BUSINESS
		CINCINNATI				
344	369	4	—	3	93	Textile (cotton) mfg.
649	705	4	—	4	93	Millwork (building mat'l)
49	73	23	—	10	67	Machine tools, mfg.
406	592	13	—	18	69	Machine tools, mfg.
673	860	12	—	9	79	Machinery specialties, mfg.
461	567	15	—	4	81	Machinery mfg.
930	1,166	10	(1)	9	80	Machine tools, mfg.
723	980	20	—	6	74	Machine tools, mfg.
1,591	1,982	13	—	7	80	Machine tools, mfg.
588	903	25	1	8	65	Office appliances, mfg.
960	1,109	9	2	3	86	Foundry (stoves and furn's)
98	119	2	1	15	82	Prin'g and pub'g (books)
752	811	3	—	4	93	Prin'g and publish'g (misc.)
2,059	2,228	3	—	5	92	Printing and publishing
536	714	10	6	9	75	Telephone service
642	847	15	—	9	76	Trainmen, street railw's
11,461	14,025	11	1	7	82	Total
		CLEVELAND				
2,171	2,878	5	1	18	75	Auto. & motor truck mfg.
2,663	2,923	6	1	2	91	Auto. & motor truck mfg.
4,450	6,289	17	7	4	71	Auto. & motor truck mfg.
518	1,540	13	43	10	34	Tractor mfg.
478	548	9	—	4	87	Paint and varnish mfg.
4,439	5,589	8	7	6	79	Storage batteries, mfg.
4,969	5,789	13	—	1	86	Storage batteries, etc.
2,154	2,393	2	1	7	90	Machinery (heavy) mfg.
2,250	3,234	18	9	4	70	Motors, mfg.
1,307	1,386	1	2	3	94	Metal wire, etc., mfg.
1,327	1,520	6	1	5	87	Metal wire, etc., mfg.
1,161	1,290	7	—	3	90	Sewing machines, mfg
4,488	5,081	5	2	4	88	Oil stoves, mfg.
1,927	2,334	9	2	7	83	Metal wire, etc., mfg.
108	140	16	—	6	77	Tel. service (Clerical)
1,906	2,262	16	1	1	84	Tel. serv. (Operation)
2,209	2,889	1	18	5	76	Tel. s rv. (Plant)
38,525	48,085	10	5	5	80	Total

of 1 per cent.

TABLE

TYPE OF SEPARATION (DISCHARGE, LAY-OFF, ENTRY INTO MILITARY SERVICE, OR 1913–14 AND 1917–

INDUSTRY OR NATURE OF BUSINESS	ESTABLISHMENT NUMBER	NUMBER OF WORKERS	NUMBER		
			EMPLOYEES LEAVNG DURING		
			WERE DISCHARGED	WERE LAID OFF	ENTERED MILITARY SERVICE
	DETROIT				
Automobile mfg.	194	31,950	169	110	3,122
Automobile parts, mfg.	195	783	116	306	63
Automobile mfg.	200	9,869	4,886	2,085	2,304
Automobile parts, mfg.	202	1,944	965	1,879	362
Automobile parts, mfg.	203	114	120	—	30
Automobile mfg.	204	135	52	260	42
Automobile mfg.	205	11,125	5,115	3,799	2,727
Automobile mfg.	209	121	148	32	64
Automobile parts, mfg.	210	314	88	52	28
Automobile parts, mfg.	211	1,103	747	242	317
Chemicals and drug mfg.	214	668	112	—	95
Clothing and overalls, mfg.	216	480	55	—	25
Machine tools, mfg.	218	630	113	—	130
Iron and steel (small parts), mfg.	221	218	18	—	22
Steel forgings, mfg.	225	316	102	250	53
Steel castings, mfg.	227	390	63	24	67
Structural steel mfg.	228	161	43	27	15
Steel forgings, mfg.	230	241	137	—	68
Screw machine products, mfg.	232	438	168	—	84
Public utilities:					
Gas mfg.	235	1,933	94	—	137
Telephone serv. (Comm. dept.)	236	161	15	3	20
Telephone service (Clerical)	237	138	13	20	13
Telephone service (Installation)	238	431	66	37	89
Telephone service (Traffic)	239	2,167	548	4	—
Telephone serv. (Construction)	240	331	51	26	106
Slaughtering and meat packing	241	456	365	—	45
Total	[26]	66,617	14,369	9,156	10,028

[1] Less than ½

B — *Continued*

VOLUNTARY QUITTING) IN INDIVIDUAL ESTABLISHMENTS AND SPECIFIED CITIES, 1917–18

18

OF THE YEAR WHO		PER CENT EMPLOYEES LEAVING DURING THE YEAR WHO				INDUSTRY OR NATURE OF BUSINESS
LEFT VOLUNTARILY	TOTAL	WERE DISCHARGED	WERE LAID OFF	ENTERED MILITARY SERVICE	LEFT VOLUNTARILY	
		DETROIT				
11,230	14,631	1	1	21	77	Automobile mfg.
1,368	2,123	5	14	3	77	Automobile parts, mfg
20,916	30,191	16	7	8	69	Automobile mfg.
3,581	6,787	14	28	5	53	Automobile parts, mfg.
273	423	28	—	7	65	Automobile parts, mfg.
183	537	10	48	8	34	Automobile mfg.
34,167	45,808	11	8	6	75	Automobile mfg.
369	613	24	5	10	60	Automobile mfg.
1,512	1,680	5	3	2	90	Automobile parts, mfg.
4,489	5,795	13	4	5	77	Automobile parts, mfg.
924	1,131	10	—	8	82	Chemicals and drug mfg.
898	978	6	—	3	92	Clothing & overalls, mfg.
1,190	1,433	8	—	9	83	Machine tools, mfg.
344	384	5	—	6	90	Iron & st'l(sm'l p'ts.), mfg.
290	695	15	36	8	42	Steel forgings, mfg.
912	1,066	6	2	6	86	Steel castings, mfg.
482	567	8	5	3	85	Structural steel mfg.
694	899	15	—	8	77	Steel forgings, mfg.
1,805	2,057	8	—	4	88	Screw mach. products, mfg.
						Public utilities:
809	1,040	9	—	13	78	Gas mfg.
68	106	14	3	19	64	Tel. serv. (Comm. dept.)
95	141	9	14	9	67	Tel. serv. (Clerical)
318	510	13	7	17	62	Tel. serv. (Installation)
2,463	3,015	18	(1)	—	82	Tel. serv. (Traffic)
453	633	8	4	17	71	Tel. serv. (Construction)
1,464	1,874	19	—	2	78	Slaugh'g and m't pack ng
91,564	125,117	11	7	8	73	Total

of 1 per cent.

TABLE

TYPE OF SEPARATION (DISCHARGE, LAY-OFF, ENTRY INTO MILITARY SERVICE, OR 1913–14 AND 1917–

NUMBER

INDUSTRY OR NATURE OF BUSINESS	ESTABLISHMENT NUMBER	NUMBER OF WORKERS	EMPLOYEES LEAVING DURING		
			WERE DISCHARGED	WERE LAID OFF	ENTERED MILITARY SERVICE
			MILWAUKEE		
Motor vehicles and parts, mfg.	242	1,665	216	170	280
Automobile parts, mfg.	243	1,246	362	323	233
Chemicals, mfg.	244	346	14	—	52
Chemicals, mfg.	245	876	250	350	318
Textiles, mfg.	246	820	60	22	—
Textiles, mfg.	247	468	134	—	26
Leather mfg.	248	3,168	604	30	224
Rubber goods, mfg.	249	1,275	298	22	216
Machinery (heavy) mfg.	250	638	123	8	63
Machinery (heavy) mfg.	251	4,732	431	—	453
Machinery (heavy) mfg.	252	524	62	—	56
Machinery (heavy) mfg.	253	998	202	—	140
Machinery (heavy) mfg.	254	1,300	116	6	146
Heating devices	255	238	—	—	22
Electrical appliances, mfg.	256	464	105	—	13
Electrical appliances, mfg.	257	1,181	270	48	180
Castings, mfg.	258	542	120	28	10
Household metal ware mfg.	259	540	90	80	60
Public utilities: Street railw's, etc.	262	3,643	460	55	350
Total	[19]	24,664	3,917	1,142	2,842
			SAN FRANCISCO		
Explosives, mfg.	265	1,795	812	—	318
Agricultural implements, mfg.	267	2,224	436	—	372
Structural iron and steel, mfg.	268	500	100	250	71
Mercantile establishment	269	85	24	14	20
Mercantile establishment	270	244	42	86	18
Mercantile establishment	271	899	62	431	—
Public utilities:					
Gas and elec. (Main office)	273	308	28	52	27
Gas and elec. (Metro. district)	274	1,173	26	1,350	128
Gas and elec. (Country dist.)	275	3,424	514	3,864	324
Total	[9]	10,652	2,044	6,047	1,278

[1] Less than ½

B — *Concluded*

VOLUNTARY QUITTING) IN INDIVIDUAL ESTABLISHMENTS AND SPECIFIED CITIES, 1917–18

18

OF THE YEAR WHO		PER CENT EMPLOYEES LEAVING DURING THE YEAR WHO				INDUSTRY OR NATURE OF BUSINESS
LEFT VOLUNTARILY	TOTAL	WERE DISCHARGED	WERE LAID OFF	ENTERED MILITARY SERVICE	LEFT VOLUNTARILY	
		MILWAUKEE				
2,082	2,746	8	6	10	76	Motor vehic's & p'ts, mfg.
2,759	3,677	10	9	6	75	Automobile parts, mfg.
544	610	2	—	9	89	Chemicals, mfg.
2,824	3,742	7	9	8	75	Chemicals, mfg.
692	774	8	3	—	89	Textiles, mfg.
699	859	16	—	3	81	Textiles, mfg.
5,760	6,618	9	(1)	3	87	Leather mfg.
4,053	4,589	6	(1)	5	88	Leather goods, mfg.
609	803	15	1	8	76	Machinery (heavy) mfg.
5,815	6,699	6	—	7	87	Machinery (heavy) mfg.
662	780	8	—	7	85	Machinery (heavy) mfg.
1,758	2,100	10	—	7	85	Machinery (heavy) mfg.
2,815	3,083	4	(1)	5	91	Machinery (heavy) mfg.
197	219	—	—	10	90	Heating devices
332	450	23	—	3	74	Electrical appliances, mfg.
2,434	2,932	9	2	6	83	Electrical appliances, mfg.
1,312	1,470	8	2	1	90	Castings, mfg.
1,432	1,662	5	5	4	86	Household metal ware mfg.
2,863	3,728	12	1	9	77	Pub. utilities: Str't rys., etc.
39,642	47,543	8	2	6	83	Total
BAY REGION						
6,670	7,800	10	—	4	86	Explosives, mfg.
4,530	5,338	8	—	7	85	Agricul. implements, mfg.
601	1,022	10	25	7	59	Struc. iron and steel, mfg.
63	121	20	12	16	52	Mercantile establishment
263	409	10	21	4	64	Mercantile establishment
1,075	1,568	4	27	—	69	Mercantile establishment
						Public utilities:
94	201	14	26	13	47	Gas & elec. (Main off.)
152	1,656	2	82	8	9	Gas & elec. (Metr. dis.)
3,854	8,556	6	45	4	45	Gas & elec. (C'n'y dis.)
17,302	26,671	8	23	5	65	Total

of 1 per cent.

TABLE

NUMBER AND PER CENT OF EMPLOYEES IN THE UNSTABLE PART OF THE WORKING ACCESSIONS, SEPARATIONS, AND FLUX, IN INDIVIDUAL

INDUSTRY OR NATURE OF BUSINESS	ESTABLISHMENT NUMBER	TOTAL WORKING FORCE	NUMBER IN CONTINUOUS SERVICE OVER ONE YEAR	UNSTABLE
				NUMBER
		CHICAGO		
Clothing, men's, mfg.	103	6,027	3,871	2,156
Printing presses, mfg.	104	764	594	170
Agricultural implements, mfg.	105	4,211	3,596	615
Agricultural implements, mfg.	106	5,759	3,890	1,869
Machinery (coal mining), mfg.	107	611	356	255
Mail order house	110	1,042	665	367
Brass and metal specialties, mfg.	114	283	108	175
Office appliances, mfg.	116	667	239	428
Public utilities: Telephone service	124	13,604	10,905	2,699
Total	[9]	32,968	24,224	8,744
		MILWAUKEE		
Motor vehicles and parts, mfg.	242	1,665	819	846
Machinery (heavy) mfg.	250	638	392	246
Public utilities: Street railways, etc.	262	3,643	2,300	1,343
Total	[3]	5,946	3,511	2,435
		CLEVELAND		
Automobile and motor truck mfg.	156	4,456	2,795	1,661
Automobile and motor truck mfg.	158	2,173	298	1,875
Street railway cars, mfg.	159	344	123	221
Storage batt's and carbon prod's mfg.	166	1,610	757	853
Woodwork, sewing mach. cabinets, etc.	169	1,514	964	550
Machine tools, mfg.	172	1,263	592	671
Machinery (heavy) mfg.	173	940	448	492
Metal wire, etc., mfg.	176	917	605	312
Sewing machines, mfg.	179	590	376	214
Electrical appliances, mfg.	180	393	194	199
Malleable iron castings, mfg.	183	937	401	536
Telephone service (Clerical force)	191	102	44	58
Telephone service (Oper. force)	192	1,368	914	454
Telephone service (Plant dept.)	193	1,267	372	895
Total	[14]	17,874	8,883	8,991

C

FORCE, NUMBER IN CONTINUOUS SERVICE OVER ONE YEAR AND NUMBER OF ESTABLISHMENTS AND SPECIFIED CITIES, 1917–18

FORCE	LABOR CHANGES			INDUSTRY OR NATURE OF BUSINESS
PER CENT	ACCESSION	SEPARATION	TOTAL (FLUX)	
		CHICAGO		
36	5,731	7,240	12,971	Clothing, men's, mfg.
22	510	471	981	Printing presses, mfg.
15	2,865	2,962	5,827	Agricultural implements, mfg.
32	5,486	4,729	10,215	Agricultural implements, mfg.
42	782	764	1,546	Machinery (coal mining), mfg.
36	1,358	1,332	2,690	Mail order house
62	590	536	1,126	Brass and metal specialties, mfg.
64	1,879	1,712	3,591	Office appliances, mfg.
20	9,524	11,454	20,978	Public utilities: Telephone service
27	28,725	31,200	59,925	Total
		MILWAUKEE		
50	2,435	2,748	5,183	Motor vehicles and parts, mfg.
39	931	803	1,734	Machinery (heavy) mfg.
37	3,058	3,728	6,786	Public utilities: Street railways, etc.
41	6,424	7,279	13,703	Total
		CLEVELAND		
37	3,552	2,878	6,430	Automobile and motor truck mfg.
86	5,179	6,289	11,468	Automobile and motor truck mfg.
64	1,016	1,038	2,054	Street railway cars, mfg.
53	6,036	5,789	11,825	Storage batt's and carbon prod's mfg.
36	3,410	4,566	7,976	Woodw'k, sewing mach. cabinets, etc.
53	3,520	2,556	6,076	Machine tools, mfg.
52	2,691	2,393	5,084	Machinery (heavy) mfg.
34	1,286	1,386	2,672	Metal wire, etc., mfg.
36	1,281	1,290	2,571	Sewing machines, mfg.
51	941	776	1,717	Electrical appliances, mfg.
57	3,077	3,091	6,168	Malleable iron castings, mfg.
57	132	140	272	Telephone service (Clerical force)
33	2,328	2,262	4,590	Telephone service (Oper. force)
71	2,200	2,889	5,089	Telephone service (Plant dept.)
50	36,649	37,343	73,992	Total

TABLE

NUMBER AND PER CENT OF EMPLOYEES IN THE UNSTABLE PART OF THE WORKING ACCESSIONS, SEPARATIONS, AND FLUX, IN INDIVIDUAL

INDUSTRY OR NATURE OF BUSINESS	ESTABLISHMENT NUMBER	TOTAL WORKING FORCE	NUMBER IN CONTINUOUS SERVICE OVER ONE YEAR	UNSTABLE
				NUMBER
	DETROIT			
Automobile mfg.	204	135	51	84
Clothing and overalls, mfg.	216	480	248	232
Iron and steel (small parts), mfg.	221	218	163	55
Heating devices, mfg.	222	497	179	318
Steel forgings, mfg.	225	316	164	152
Steel castings, mfg.	227	390	156	234
Structural steel, mfg.	228	161	82	79
Electrical appliances, mfg.	229	213	73	140
Public utilities: Gas mfg.	235	1,933	977	956
Tel. serv. (Com. dept.)	236	161	98	63
Tel. serv. (Cler. force)	237	138	76	62
Tel. serv. (Installat'n)	238	432	253	178
Tel. serv. (Construc'n)	240	331	149	182
Total	[13]	5,404	2,669	2,735
	CINCINNATI			
Textiles (cotton), mfg.	133	330	280	50
Machine tools, mfg.	137	127	85	42
Machine tools, mfg.	138	602	272	330
Machinery (specialties), mfg.	139	669	328	341
Machinery mfg.	140	407	274	133
Machine tools, mfg.	141	883	606	277
Engineering specialties, mfg.	146	1,150	670	480
Printing and publishing (books)	150	244	201	43
Printing and publishing (miscel.)	151	767	508	259
Total	[9]	5,179	3,224	1,955
	SAN FRANCISCO			
Oil refinery	263	421	158	263
Sugar refinery	264	1,259	420	839
Machinery mfg.	266	173	71	102
Mercantile establishment	269	85	42	43
Mercantile establishment	270	244	119	125
Total	[5]	2,182	810	1,372

C — *Concluded*

FORCE, NUMBER IN CONTINUOUS SERVICE OVER ONE YEAR, AND NUMBER OF ESTABLISHMENTS AND SPECIFIED CITIES, 1917–18

FORCE	LABOR CHANGES			INDUSTRY OR NATURE OF BUSINESS
PER CENT	ACCESSIONS	SEPARATIONS	TOTAL (FLUX)	
		DETROIT		
62	477	537	1,014	Automobile mfg.
48	686	978	1,664	Clothing and overalls, mfg.
25	392	384	776	Iron and steel (small parts), mfg.
64	834	1,167	2,001	Heating devices, mfg.
48	910	695	1,605	Steel forgings, mfg.
60	1,296	1,066	2,362	Steel castings, mfg.
49	543	567	1,110	Structural steel, mfg
66	744	744	1,488	Electrical appliances, mfg.
49	1,585	1,040	2,625	Public utilities: Gas mfg.
39	104	106	210	Tel. serv. (Com. dept)
45	167	141	308	Tel. serv. (Cler. force)
41	533	510	1,043	Tel. serv. (Installat'n)
55	628	633	1,261	Tel. serv. (Cons'n)
51	8,899	8,568	17,467	Total
		CINCINNATI		
15	354	369	723	Textiles (cotton), mfg.
33	103	73	176	Machine tools, mfg.
55	1,020	980	2,000	Machine tools, mfg.
51	847	860	1,707	Machinery (specialties), mfg.
33	502	567	1,069	Machinery mfg.
31	1,363	1,166	2,529	Machine tools, mfg.
42	2,030	1,989	4,019	Engineering specialties, mfg.
18	82	119	201	Printing and publishing (books)
34	667	811	1,478	Printing and publishing (miscel.)
38	6,968	6,934	13,902	Total
		SAN FRANCISCO		
62	1,141	980	2,121	Oil refinery
67	3,566	3,011	6,577	Sugar refinery
59	261	362	623	Machinery mfg.
51	138	121	259	Mercantile establishment
51	435	409	844	Mercantile establishment
63	5,541	4,883	10,424	Total

TABLE D

LABOR MOBILITY BY MONTHS, FROM JANUARY, 1910, TO DECEMBER, 1919, INCLUSIVE

YEAR AND MONTH	NUMBER OF FULL-YEAR WORKERS [1]	TOTAL LABOR HOURS (THOUSANDS)	LABOR CHANGES					
			NUMBER			RATE PER FULL-TIME WORKER		
			ACCESSIONS	SEPARATIONS	TOTAL	ACCESSION	SEPARATION	TOTAL (FLUX)
1910								
January	9,684	2,421	1,025	1,004	2,029	1.26	1.23	2.49
February	8,754	2,189	835	1,024	1,859	1.14	1.41	2.55
March	9,630	2,407	1,573	1,445	3,018	1.95	1.80	3.75
April	8,832	2,208	1,558	1,518	3,076	2.13	2.07	4.20
May	8,585	2,146	1,552	1,346	2,898	2.16	1.89	4.05
June	9,006	2,252	1,634	1,271	2,905	2.19	1.68	3.87
July	10,353	2,588	1,530	1,555	3,085	1.77	1.80	3.57
August	6,937	1,734	1,141	1,218	2,359	1.98	2.10	4.08
September	10,241	2,560	1,124	1,261	2,385	1.32	1.47	2.79
October	9,042	2,261	810	870	1,680	1.08	1.14	2.22
November	9,717	2,429	705	844	1,549	.87	1.05	1.92
December	8,334	2,084	344	411	755	.51	.60	1.11
1911								
January	13,727	3,432	699	839	1,538	.60	.72	1.32
February	14,806	3,701	954	840	1,794	.78	.69	1.47
March	13,770	3,442	1,136	888	2,024	.99	.78	1.77
April	13,836	3,459	1,090	992	2,082	.96	.87	1.83
May	15,150	3,788	1,429	1,259	2,688	1.14	.99	2.13
June	13,923	3,481	1,313	1,286	2,599	1.14	1.11	2.25
July	14,013	3,503	1,070	1,222	2,292	.93	1.05	1.98
August	12,786	3,196	1,190	1,081	2,271	1.11	1.02	2.13
September	14,015	3,504	709	932	1,641	.60	.81	1.41
October	13,840	3,460	652	942	1,594	.57	.81	1.38
November	14,651	3,663	556	1,026	1,582	.45	.84	1.29
December	13,049	3,262	344	878	1,222	.33	.81	1.14
1912								
January	14,624	3,656	736	884	1,620	.60	.72	1.32
February	13,432	3,358	751	874	1,625	.66	.78	1.44
March	13,346	3,337	993	887	1,880	.90	.81	1.71
April	13,538	3,384	1,319	1,043	2,362	1.17	.93	2.10
May	15,065	3,766	1,385	1,435	2,820	1.11	1.14	2.25
June	13,778	3,444	1,611	1,049	2,660	1.41	.90	2.31
July	15,127	3,782	1,756	1,400	3,156	1.38	1.11	2.49
August	14,077	3,519	1,801	1,363	3,164	1.53	1.17	2.70
September	15,832	3,958	1,886	1,362	3,248	1.44	1.02	2.46
October	16,307	4,077	2,059	1,395	3,454	1.53	1.02	2.55
November	19,613	4,903	1,996	1,368	3,364	1.23	.84	2.07
December	17,435	4,359	1,585	1,172	2,757	1.08	.81	1.89

[1] See footnote on page 211.

TABLE D — *Continued*

LABOR MOBILITY BY MONTHS, FROM JANUARY, 1910, TO DECEMBER, 1919, INCLUSIVE

YEAR AND MONTH	NUMBER OF FULL-YEAR WORKERS [1]	TOTAL LABOR HOURS (THOUSANDS)	LABOR CHANGES					
			NUMBER			RATE PER FULL-TIME WORKER		
			ACCESSIONS	SEPARATIONS	TOTAL	ACCESSION	SEPARATION	TOTAL (FLUX)
1913								
January	157,841	39,460	24,185	18,365	42,550	1.83	1.41	3.24
February	156,126	39,032	19,737	17,558	37,295	1.53	1.35	2.88
March	168,238	42,059	23,267	24,219	47,486	1.65	1.74	3.39
April	161,965	40,491	28,203	24,731	52,934	2.10	1.83	3.93
May	166,511	41,628	26,101	25,948	52,049	1.89	1.86	3.75
June	158,475	39,619	20,443	20,483	40,926	1.56	1.56	3.12
July	159,221	39,805	18,451	20,853	39,304	1.38	1.56	2.94
August	167,001	41,750	14,847	17,203	32,050	1.08	1.23	2.31
September	152,311	38,078	13,453	16,650	30,103	1.05	1.32	2.37
October	157,428	39,357	11,607	13,233	24,840	.87	1.02	1.89
November	156,452	39,113	9,456	10,451	19,907	.72	.81	1.53
December	153,208	38,302	7,061	9,048	16,109	.54	.72	1.26
1914								
January	43,125	10,781	2,513	2,126	4,639	.69	.60	1.29
February	43,342	10,835	2,716	1,886	4,602	.75	.51	1.26
March	42,771	10,693	2,994	2,460	5,454	.84	.69	1.53
April	45,014	11,253	2,552	2,358	5,405	.69	.75	1.44
May	39,793	9,948	2,423	4,108	6,531	.72	1.23	1.95
June	40,867	10,217	3,239	4,168	7,407	.96	1.23	2.19
July	39,487	9,872	2,931	1,975	4,906	.90	.60	1.50
August	42,512	10,628	3,371	3,097	6,468	.96	.87	1.83
September	44,116	11,029	4,364	2,323	6,687	1.20	.63	1.83
October	56,668	14,167	3,565	3,279	6,844	.75	.69	1.44
November	58,192	14,548	3,001	2,269	5,270	.63	.48	1.11
December	57,636	14,409	3,189	2,759	5,948	.66	.57	1.23
1915								
January	87,031	21,758	4,349	3,957	8,306	.60	.54	1.14
February	86,061	21,515	5,199	4,620	9,819	.72	.63	1.35
March	91,589	22,897	6,400	6,096	12,496	.84	.81	1.65
April	86,224	21,556	8,107	4,868	12,975	1.14	.69	1.83
May	89,519	22,380	6,767	5,227	11,994	.90	.69	1.59
June	96,801	24,200	7,081	4,867	11,948	.87	.60	1.47
July	93,716	23,429	6,058	5,879	11,937	.78	.75	1.53
August	94,034	23,508	6,597	5,419	12,016	.84	.69	1.53
September	107,960	26,990	13,184	8,213	21,397	1.47	.90	2.37
October	99,741	24,935	12,061	6,256	18,317	1.44	.75	2.19
November	67,672	16,918	11,558	6,268	17,826	2.04	1.11	3.15
December	92,223	23,056	11,796	6,077	17,873	1.53	.78	2.31

[1] See footnote on page 211.

TABLE D — *Continued*

LABOR MOBILITY BY MONTHS, FROM JANUARY, 1910, TO DECEMBER, 1919, INCLUSIVE

YEAR AND MONTH	NUMBER OF FULL-YEAR WORKERS [1]	TOTAL LABOR HOURS (THOUSANDS)	LABOR CHANGES					
			NUMBER			RATE PER FULL-TIME WORKER		
			ACCESSIONS	SEPARATIONS	TOTAL	ACCESSION	SEPARATION	TOTAL (FLUX)
1916								
January	46,885	11,721	8,649	4,994	13,643	2.22	1.29	3.51
February	53,541	13,385	10,351	5,632	15,983	2.31	1.26	3.57
March	56,410	14,102	7,348	6,706	14,054	1.56	1.44	3.00
April	59,237	14,809	10,321	5,737	16,058	2.10	1.17	3.27
May	58,143	14,536	8,518	7,091	15,609	1.77	1.47	3.24
June	58,152	14,538	6,730	9,280	16,010	1.38	1.92	3.30
July	57,505	14,376	5,346	4,678	10,024	1.11	.99	2.10
August	57,866	14,466	7,727	5,733	13,460	1.59	1.20	2.79
September	60,549	15,137	6,455	5,087	11,542	1.29	1.02	2.31
October	62,492	15,623	6,336	4,205	10,541	1.23	.81	2.04
November	63,408	15,852	3,921	3,821	7,742	.75	.72	1.47
December	64,424	16,106	5,499	3,884	9,383	1.02	.72	1.74
1917								
January	33,675	8,419	3,568	4,439	8,007	1.26	1.59	2.85
February	32,260	8,065	2,948	3,368	6,316	1.11	1.26	2.37
March	21,211	5,303	2,057	2,099	4,156	1.17	1.20	2.37
April	21,667	5,417	2,416	2,652	5,068	1.35	1.47	2.82
May	28,487	7,122	4,871	4,700	9,571	2.04	1.98	4.02
June	32,572	8,143	5,449	4,921	10,370	2.01	1.80	3.81
July	35,637	8,909	5,265	5,074	10,339	1.77	1.71	3.48
August	37,398	9,350	6,661	6,137	12,798	2.13	1.98	4.11
September	37,723	9,431	6,288	6,022	12,310	2.01	1.92	3.93
October	38,583	9,646	6,746	5,127	11,873	2.10	1.59	3.69
November	47,401	11,850	7,209	6,076	13,285	1.83	1.53	3.36
December	39,994	9,998	5,307	6,488	11,795	1.59	1.95	3.54
1918								
January	37,973	9,493	5,860	5,238	11,098	1.86	1.65	3.51
February	37,008	9,252	4,952	5,563	10,515	1.62	1.80	3.42
March	37,387	9,347	6,636	6,447	13,083	2.13	2.07	4.20
April	37,924	9,481	8,322	7,228	15,550	2.64	2.28	4.92
May	35,819	8,955	7,792	6,256	14,048	2.61	2.10	4.71
June	30,319	7,580	5,537	4,789	10,326	2.19	1.89	4.08
July	24,446	6,111	4,652	4,024	8,676	2.28	1.98	4.26
August	23,877	5,969	3,953	4,320	8,273	1.98	2.16	4.14
September	21,299	5,325	2,954	2,643	5,597	1.65	1.50	3.15
October	21,817	5,454	2,702	2,850	5,552	1.50	1.56	3.06
November	28,352	7,088	3,878	2,350	6,228	1.65	.99	2.64
December	22,476	6,619	2,496	2,042	4,538	1.32	1.08	2.40

[1] See footnote on page 211.

TABLE D — *Concluded*

LABOR MOBILITY BY MONTHS, FROM JANUARY, 1910, TO DECEMBER, 1919, INCLUSIVE

YEAR AND MONTH	NUMBER OF FULL-YEAR WORKERS [1]	TOTAL LABOR HOURS (THOUSANDS)	LABOR CHANGES					
			NUMBER			RATE PER FULL-TIME WORKER		
			ACCESSIONS	SEPARATIONS	TOTAL	ACCESSION	SEPARATION	TOTAL (FLUX)
1919								
January	20,989	5,247	2,408	2,517	4,925	1.38	**1.44**	2.82
February	20,238	5,059	1,347	1,890	3,237	.81	**1.11**	1.92
March	19,591	4,898	1,119	1,962	3,081	.69	**1.20**	1.89
April	18,835	4,709	1,137	1,741	2,878	.72	**1.11**	1.83
May	17,128	4,282	1,096	1,503	2,599	.78	**1.05**	1.83
June	14,233	3,558	1,002	1,145	2,147	.84	**.96**	1.80
July	13,979	3,495	1,238	822	2,060	1.05	**.72**	1.77
August	5,638	1,410	601	516	1,117	1.29	**1.11**	2.40
September	5,785	1,446	710	478	1,188	1.47	**.99**	2.46
October	9,502	2,376	1,428	643	2,071	1.80	**.81**	2.61
November	16,400	4,100	1,513	1,001	2,514	1.11	**.72**	1.83
December	10,327	2,582	620	404	1,024	.72	**.48**	1.20

[1] Calculated as follows:

$$\frac{\frac{2{,}421{,}000}{3000}}{12}$$

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