

Three Aspects of Labor Dynamics

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FOREWORD

WHEN THE STUDY from which the present volume has resulted was planned and initiated, unemployment still overshadowed all other labor market problems. Controversies over the number of unemployed and over the degree to which unemployment might become a permanent problem occupied the forefront of interest. Now, however, an almost complete reversal has occurred in at least the popular interest in labor market problems. Discussions of labor shortages have almost obliterated concern with unemployment issues.

In spite of this shift in the public interest, periods of extensive unemployment during the past three decades remain of interest to students of labor market phenomena. They provide clues to many of the problems that may arise during post-war readjustment. Perhaps more important, much of the most detailed labor market information available is to be found in the surveys and enumerations made during the depression years.

The term "labor dynamics," interpreted broadly, includes all kinds of variations in the labor force of the nation—the entry of new generations into gainful work and retirement and death of aged workers, internal migrations, occupational and industrial shifts, turnover of the working force in industrial establishments and between employment and unemployment, the temporary entry of marginal workers into gainful pursuits and their withdrawal from the labor market because of changing business conditions, and the like. Some of these shifts are not more than temporary variations in the behavior of individuals; others affect their work status for a longer period of time, occasionally for the rest of their lives. A complete picture of labor dynamics, which would summarize all these ins and outs, ups and downs, backs and forths, cannot be obtained without preliminary monographic research on different types of related phenomena. The present report deals with three specific kinds of shifts of the working population:

turnover of the working force in establishments, turnover of the unemployed, and forced entries into the labor market during depressions.

This study was a natural further step growing out of Mr. Woytinsky's earlier investigations of labor market data with respect to major social security issues, which resulted in the publication of *Labor in the United States* in 1938 and of *Seasonal Variations in Employment in the United States* in 1939. Summarizations of particular sections of the present report have been issued at several stages. In March 1939 the Committee on Social Security published a pamphlet on "Recent Trends in Labor Turnover, Their Causes, and Their Effects on the Labor Market," which summarized briefly much of the ground covered by Part I of the present volume. In January 1940 the Committee published a pamphlet on "Additional Workers and the Volume of Unemployment in the Depression," which gave a brief statement of the major points covered by Part III. Certain other materials developed during the study which are not included in the present report were published in August 1939 by the Social Security Board, as its Research and Statistics Bureau Memorandum No. 40, under the title "Fluctuations in Employment Covered by the Federal Old-Age Insurance Program." Since the publication of these preliminary sections, the manuscript has been extensively revised and additional data that became available during 1940 and 1941 have been introduced.

Special acknowledgment is made on behalf of the author of the assistance given him and the materials made available to him during the study by the Bureau of Research and Statistics of the Social Security Board. The statistical tables were computed by Helen Anderson and the charts were prepared by Harry de Mars of the Board's staff under the general supervision of the author. Statistical material in the text was brought up to date and assistance given in the final preparation of the manuscript by Emma S. Woytinsky. Mary Charles Cole prepared the manuscript for publication.

While the study has been sponsored by the Committee on Social Security, the resulting report has not been submitted to the Committee for formal review or approval. The statements and con-

clusions of the author are therefore entirely his own, and do not necessarily reflect the opinions or attitudes of members of the Committee or of the Social Science Research Council.

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CONTENTS

PART I. TURNOVER OF LABOR

Chapter		
I.	OBJECTIVES AND FINDINGS	1
	Findings in Brief	2
II.	METHODS AND SOURCES OF LABOR TURNOVER STATISTICS	6
	Types of Separation	7
	Measurement of Turnover Rates	9
	Labor Turnover and Variations in Employment	9
	Available Statistics of Labor Turnover	11
III.	TURNOVER IN A PERIOD OF EXTENSIVE DEMAND FOR LABOR (1910-1919)	15
	Extent of Labor Turnover by Years	15
	Extent of Labor Turnover by Months	16
	Seasonal Variations	19
	Labor Turnover by Establishments, Cities and Industries	20
	Labor Turnover by Skill, Sex, Age, and Working Conditions	23
	"Stable" and "Unstable" Working Force	23
IV.	TURNOVER IN A PERIOD OF INCREASING LABOR MARKET RIGIDITY (1919-1929)	29
	Extent of Labor Turnover by Years	29
	Extent of Labor Turnover by Months	33
	Distribution of Separations	36
	Seasonal Variations	36
	"Stable" and "Unstable" Working Force	39
V.	TURNOVER IN A PERIOD OF HEAVY UNEMPLOYMENT (1930-1940)	42
	Labor Turnover Reports of the Bureau of Labor Statistics	42
	Comparability with Labor Turnover Statistics of the Preceding Decade	43
	Representativeness of the New Series	45
	Extent of Labor Turnover by Years	47
	Extent of Labor Turnover by Months	49
	Distribution of Separations	52
	Seasonal Variations	55
	Labor Turnover by Industries	58
	Labor Turnover by Size of Establishment	59
	Labor Turnover and Length of Service	60

PART II. TURNOVER OF THE UNEMPLOYED

Chapter		
VI.	OBJECTIVES AND FINDINGS	61
	Findings in Brief	64
VII.	INTERPRETATION OF THE DISTRIBUTION OF THE UNEMPLOYED BY DURATION OF IDLENESS	69
	Measuring the Number of Newly Separated Workers	73
	Measuring the "Hard Core" of Unemployment	74
VIII.	TURNOVER OF THE UNEMPLOYED BEFORE THE DEPRESSION OF THE 1930's	78
	Unemployment in 1915	80
	Unemployment in Columbus, Ohio, 1921-1925	82
IX.	TURNOVER OF THE UNEMPLOYED DURING THE DEPRESSION OF THE 1930's	86
	Unemployment in the United States on April 1, 1930	88
	Unemployment in Selected Urban Areas in January 1931	90
	Unemployment in Buffalo, New York, 1929 to 1933	94
	Unemployment in Lincoln, Nebraska, 1932 and 1933	97
	Unemployment in Philadelphia, 1931 to 1938	99

PART III. ADDITIONAL WORKERS IN DEPRESSIONS

X.	OBJECTIVES, CONCEPTS AND FINDINGS	105
	Additional Workers and Estimates of Unemployment	107
	Variations in the Supply of Labor	110
	"Primary" and "Secondary" Unemployment	114
	Findings in Brief	116
XI.	METHODS OF MEASURING THE NUMBER OF ADDITIONAL WORKERS IN DEPRESSIONS	126
	Risk of Unemployment and Family Status of Workers	126
	Data Available	128
	Estimating the Probable Proportion of Additional Jobseekers from the Visible Concentration of Unemployment in Families	129
	Estimating the Probable Proportion of Additional Workers from the Visible Difference Between Unemployment Rates in One-worker and Multi-worker Households	131
	Estimating the Probable Distribution of Unemployment by Families with Different Numbers of Workers	135
	Estimating the Probability of Complete and Partial Unemployment in Families with Different Numbers of Workers	138

Chapter		
XII.	CONCENTRATION OF UNEMPLOYMENT BY FAMILIES IN 1915	144
	Unemployment Enumerations in 1915	144
	Unemployment Rate and the Proportion of Families with Unemployment	145
	Concentration of Unemployment, or Additional Job-seekers in Families with Unemployed Usual Earners	146
	Probable Proportion of Additional Workers Among the Unemployed	148
XIII.	ADDITIONAL WORKERS AT THE BEGINNING OF THE DEPRESSION (APRIL 1, 1930)	150
	Unemployment by Class of Work	151
	Unemployment by Age and Sex	153
	Unemployment by Marital Status	155
	Unemployment by Family Relationship	156
	Unemployment by Family Relationship and Duration of Idleness	161
XIV.	ADDITIONAL WORKERS IN A PERIOD OF INCREASING PRIMARY UNEMPLOYMENT (JANUARY 1931)	165
	Total Unemployment in the United States in January 1931	166
	Changes in Employment and Unemployment from April 1, 1930 to January 1931	167
	Unemployment by Sex	168
	Unemployment by Age	170
	Unemployment by Marital Status of Women	171
XV.	ADDITIONAL WORKERS IN CONSECUTIVE PHASES OF THE DEPRESSION (PHILADELPHIA SAMPLE, 1931-1938)	173
	Variations in the Number of Workers Per Family	175
	Proportion of Families with Unemployment	176
	Proportion of One-Worker and Multi-Worker Families with Unemployment	177
	Interpretation of the Philadelphia Labor Market Statistics for 1938	178
	Theoretically Probable Distribution of Families by Employment Status	181
XVI.	ADDITIONAL WORKERS BY TYPE OF FAMILIES (WINTER OF 1935-36)	184
	Distribution of Families by Size and by Employment Status of the Family Head	186
	Number of Supplementary Workers Per Family, by the Employment Status of the Head	187

Chapter		
	Employment Status of Additional Workers in Families with Unemployed Heads	189
	Unemployment Rates by Size of Family	190
	Additional Workers in Ten Large Cities	191
	Unemployment in the United States in the Winter of 1935-36	193
XVII.	VOLUNTARY REGISTRATION OF THE UNEMPLOYED IN NOVEMBER 1937	195
	The Voluntary Registration and Enumerative Check Census	196
	Business Conditions in the Fall of 1937	198
	Number of Registrants	199
	Distribution of Registrants	205
	Enumerative Check Census	211
	Deficit in Work Opportunities in November 1937	215
	Changes in Unemployment and Number of Additional Workers from 1930 to 1940	215
	INDEX	247

NOTES

1. Theoretically Probable Proportion of Workers' Families with Unemployment as a Function of the Unemployment Rate Among Workers and the Number of Workers Per Family 219
2. Differentiated Rates of Unemployment for the "First," "Second," and Other Workers in Families 223

TABLES

1. Extent of Labor Turnover from 1910 to 1919, by Years 16
2. Length-of-Service Distribution of Active and Separated Employees, 1913-14 and 1917-18 25
3. Extent of Labor Turnover from 1919 to 1929 31
4. Length-of-Service Distribution of Employees in the Summer of 1928 40
5. Median and Weighted Average Rates of Labor Turnover in 1930 44
6. Extent of Labor Turnover from 1930 to 1940, by Years 49
7. Average Extent of Labor Turnover from 1930 to 1940, by Industries 58
8. Distribution of the Unemployed by Duration of Idleness, in 30 Cities, 1915 81
9. Distribution of the Unemployed by Duration of Idleness, in Columbus, Ohio, 1921-1925 83
10. Distribution of the Unemployed by Duration of Idleness, in the United States on April 1, 1930 90

Table

11. Distribution of the Unemployed by Duration of Idleness, in Selected Urban Areas, January 1931	93
12. Distribution of Unemployed Men by Duration of Idleness, in Buffalo, New York, 1929 to 1933	95
13. Distribution of the Unemployed by Duration of Idleness, in Lincoln, Nebraska, November 1932 and 1933	98
14. Distribution of the Unemployed by Duration of Idleness, in Philadelphia, 1931 to 1938	100
15. Proportion of the Unemployed Among Gainful Workers, by Industrial Divisions and Class of Work, in the United States, April 1, 1930	153
16. Proportion of the Unemployed Among All Gainful Workers, and Industrial Salary and Wage Earners, by Sex and Age, in the United States, April 1, 1930	154
17. Percentage Distribution of the Unemployed by Duration of Idleness and Family Relationship, in the United States, April 1, 1930	162
18. Coverage of the Labor Market Surveys in Philadelphia, 1931 to 1938	175
19. Employment Status of Members of Families Classified by the Employment Status of the Head, in Philadelphia, 1938	179
20. Average Number of Gainful Workers in Families Classified by Number of Adults and the Employment Status of the Head, in Detroit and Boston, 1935-36	187
21. Number of Supplementary Workers by the Employment Status of the Family Head in 10 Large Cities, 1935-36	192
22. Theoretically Probable Proportion of Urban Families with Unemployment (Q) for Unemployment Rates of 10 and 20 Per Cent, by States	221

DIAGRAMS

I. Turnover of Labor from 1910 to 1919, by Months	18
II. Typical Seasonal Variations in Accession and Separation Rates, 1910 to 1919	21
III. Turnover of Labor in Manufacturing Industries from 1919 to 1929, by Years	32
IV. Trend and Yearly Variations in Accession and Separation Rates in Manufacturing Industries, 1919 to 1929	34
V. Turnover of Labor in Manufacturing Industries from 1919 to 1929, by Months	35
VI. Typical Seasonal Variations in Accession and Separation Rates in Manufacturing Industries, 1919 to 1929	38

Diagram		
VII.	Representativeness of Labor Turnover Statistics, 1930 to 1940	46
VIII.	Factory Employment According to Labor Turnover Statistics and Censuses of Manufactures from 1929 to 1937	48
IX.	Turnover of Labor in Manufacturing Industries from 1930 to 1940, by Years	50
X.	Turnover of Labor in Manufacturing Industries from 1930 to 1940, by Months	51
XI.	Proportion of Quits Among Separations in Manufacturing Industries from 1930 to 1940, by Months	53
XII.	Typical Seasonal Variations in Accession and Separation Rates in Manufacturing Industries, 1930 to 1940	57
XIII.	Estimating the Hard Core from the Distribution of the Unemployed by Duration of Idleness, in Buffalo, New York, November 1930	76
XIV.	Distribution of Unemployed Men by Duration of Idleness in Buffalo, New York, 1929 to 1933	96
XV.	Example of the Influx of Additional Workers into the Labor Market Resulting from an Unusually Large Demand for Labor or the Unemployment of Usual Workers	113
XVI.	Theoretically Probable Proportion of Workers' Families with Unemployment (Q') as a Function of the Unemployment Rate Among Workers (q) and the Number of Workers Per Family (m)	132
XVII.	Theoretically Probable Unemployment Rate (q') as a Function of the Proportion of Families with Unemployment (Q) and the Number of Workers Per Family (m)	133
XVIII.	Correlation Between the Proportion of Workers' Families with Unemployment (Q) and the Unemployment Rate Among Workers (q) in the United States, 1915	146
XIX.	Per Cent of Unemployed Among All Gainful Workers and Industrial Salary and Wage Earners, by Sex and Age, in the United States, April 1, 1930	155
XX.	Estimated Percentage Distribution of Male Gainful Workers in Specified Age Classes, by Family Status, in the United States, April 1, 1930	159
XXI.	Correlation Between the Theoretically Probable Proportion of Families with Unemployment (Q) and the Number of Workers Per Family (m) for Unemployment Rates (q) of 10 and 20 Per Cent	222

APPENDIX TABLES

Appendix Table		
I.	Turnover of Labor from 1910 to 1919, by Months	227
II.	Turnover of Labor in Manufacturing Industries from 1919 to 1929, by Months	228
III.	Turnover of Labor in Manufacturing Industries from 1930 to 1941, by Months	230
IV.	Labor Turnover from 1930 to 1940, by Industries	232
V.	Turnover of Labor by Size of Establishment and Industry, 1931 to 1940	236
VI.	Auxiliary Tables for Computing the Theoretically Probable Proportion of Workers' Families with Unemployment (Q') and of Unemployed Individuals (q')	238
VII.	Summary of Unemployment Surveys in Selected Cities, 1915	239
VIII.	Estimated Distribution of Gainful Workers in Farm and Non-farm Families, by Sex, Age and Family Status, in the United States, 1930	240
IX.	Unemployment in Selected Urban Areas, on April 1, 1930 and in January 1931	240
X.	Unemployment in Philadelphia by Size-Classes of Families, from 1931 to 1938	241
XI.	Employment and Unemployment in Families Classified by Number of Adults, in Detroit, Michigan, and Boston, Massachusetts, in the Winter of 1935-36	242

CHAPTER I

OBJECTIVES AND FINDINGS

ALL SHIFTS OF WORKERS—territorial, industrial and occupational, as well as the entry of a new generation into gainful work and the withdrawal or retirement of older workers from the labor market—form a continuous succession of entries into and terminations of employment. To the employee, it is a sequence of hiring and firing. To the employer, it is a chain of accessions of new workers or the rehiring of laid-off workers on the one hand, and of separations of employees on the other—in other words, the turnover of the working force. Labor turnover statistics are computed from the employer's standpoint, while the statistics of duration of unemployment and of length of service tend to report what happens to individual employees.

In Part I of the present report labor turnover statistics are scrutinized for the purpose of determining the characteristics and trends of the flow of the working force in American industry. In view of the particular importance attached to changes in the structure of the labor market and in the characteristics of labor turnover, the analysis has been extended as far back as available information has made it possible.

Chapter I briefly summarizes the findings. Chapter II contains a general description of the sources referred to and of the concepts and methods used in them. The plan of the following three chapters is determined by the character of available labor turnover statistics, which cover more than three decades (from 1909 to 1940). Since these statistics cannot be combined into a continuous series running through the whole period of observation, but constitute rather three sets of data differentiated by origin, coverage, and methods used, labor turnover in each decade is discussed separately in Chapters III, IV and V.

FINDINGS IN BRIEF

*Labor Turnover Before and
During the World War*

Only fragmentary information on the turnover of manpower in industrial establishments is available for the nineteenth century and the first decade of the twentieth century, but it has been observed that turnover rates usually were high in prosperous years and low in periods of depression. Most terminations of employment were initiated by the employees, and variations in the number of accessions followed changes in the number of quits. When jobs were plentiful and a large number of workers quit, employment managers had to replace them and therefore the number of accessions increased.

This was also characteristic of labor turnover in the period from 1910 to the end of the World War, the first period for which some turnover statistics are available. The demand for labor in this decade exceeded the supply, and the very rapid turnover of manpower in industrial establishments indicated that workers did not feel the necessity of holding on to a job as long as it lasted. Monthly separation rates of about 10 per cent of the employees were usual before the United States entered the war, and often the total annual number of separations in a firm exceeded the average number of workers on the payroll.

Turnover rates varied from industry to industry, from town to town, and from factory to factory. They were comparatively small among skilled workers and employees of long standing, and considerably larger among unskilled and newly hired workers. Sample surveys have shown that an "unstable" group, which constituted about 11 to 13 per cent of all workers on the payrolls, was responsible for nearly three-quarters of all separations. The separation rate in this group was about 34 per cent per month in 1914-15 as compared with 2 per cent for the rest of the workers.

During the World War, turnover almost doubled because of the scarcity of labor. In 1917-18 separation rates in canvassed establishments averaged 17 per cent per month, and average turnover rates in non-reporting concerns might have been even higher. The "unstable" group did not increase considerably, but its separation rate reached 70 per cent per month, while in the "stable"

group the turnover rate increased from 1.8 to about 3.4 per cent per month.

From a management point of view, the labor turnover which prevailed before the World War was an economic waste. Yet it had certain advantages in facilitating the distribution of new workers and in meeting the demand for labor by rapidly expanding industries. The presence among employed workers of a continuously changing "unstable" group assured great flexibility in the labor market. A worker might change his job several times before he found one which suited him, but after having found it he was likely to become part of the "stable" group. Workers who quit of their own will in the hope of finding better jobs did not consider themselves as "unemployed" in the present sense of the term. Few of them remained out of jobs for a long time, but if this did occur they wrote off the loss of earnings as the price paid for a chance to better their position.

This voluntary labor turnover was possible only because there was practically no permanent unemployment in the country. At the same time it was, to a certain extent at least, a defense against the development of unemployment during occasional lapses in demand for labor. Unless the recession came suddenly, employment managers did not have to lay off workers in slack times; they could reduce their working force simply by postponing the replacement of workers who quit voluntarily, and often this procedure appeared preferable to layoffs.

Labor Turnover in the 1920's

Turnover rates were around 10 per cent per month in 1919 and 1920, then dropped to 2 to 3 per cent during the short but severe depression of 1921. Subsequently, after sharp ups and downs, a moderate turnover rate was established, and in the prosperous years before the collapse in the fall of 1929 the median accession and separation rates in manufacturing industries averaged 4.0 per cent per month.

In spite of the reduced extent of labor turnover, its general character remained the same as before the war. The main flow of manpower was still determined by the free decision of the individual worker. About 75 per cent of all terminations of employment were

classified in labor turnover statistics as "quits," and the changing extent of turnover depended mainly on the rate of replacement. However, a new factor became apparent in the relationship between separation and accession rates. The two remained closely tied to each other, but after 1921 a lag of several months between their main movements was observed. The up and down movements in separation rates followed changes in accession rates. It may be that at this time workers were already scared by the threat of unemployment and no longer changed their jobs as freely as before the war. When increased accession rates made them confident that they would easily find reemployment, the number of quits increased, and each decline in the number of openings— independent of the level of employment—was followed by a decline in the number of separations.

The difference between the extent of labor turnover in the late 1920's and in the preceding decade was accounted for largely by the decline of separations in the "unstable" group of workers, while the employment of the rest of them was not much more stable than before.

Labor Turnover After the Beginning of the Depression of the 1930's

The collapse in the fall of 1929 radically changed the character of labor turnover. Its average extent in the period from 1930 to 1939 did not differ appreciably from that in the prosperous 1920's, but after the beginning of 1930 about 75 per cent of all terminations of employment in manufacturing industries were initiated by employers. At the low ebbs of employment—in 1932, in the autumn of 1933, and in 1937—the "quit" rates were particularly small.

According to the classification used by the Bureau of Labor Statistics up to the end of 1939, "quits" included, besides voluntary separations, miscellaneous terminations of employment such as those due to sickness, invalidity, superannuation, or death,¹ or to personal reasons (for example, temporary withdrawals from the labor market of women after childbirth). Only the excess of

¹ Since January 1940, miscellaneous separations of this type have been reported separately.

the "quit" rate over the average rate of these miscellaneous separations should be regarded as the rate of voluntary turnover of labor. Measured in this way the free turnover was reduced to a small fraction of what it was prior to 1929. Apparently a feeling of insecurity and a fear of unemployment had replaced the confidence of the worker that jobs would always be available to him.

The source of instability in employment changed after the beginning of the depression in the 1930's; the varying demand for labor by industry replaced the former voluntary turnover of labor. Because so few workers quit of their own accord, employment managers rid themselves of surplus labor by large-scale discharges and layoffs. The former correlation between the extent of separations and accessions was reversed, and the two rates, in their main movement as well as in short-time variations, ran in opposite directions, so that the number of separations increased when the number of accessions declined, and vice versa. The defense program and the anticipated shortages of labor may have again changed the situation, but the effects of the new development were not yet clear at the time this report was written.

CHAPTER II

METHODS AND SOURCES OF LABOR TURNOVER STATISTICS

THE EARLY STATISTICAL SURVEYS of labor turnover were originated not because of concern for the instability of employment as a source of the economic insecurity of workers, but rather because of the difficulty employers encountered in maintaining a stable working force in their establishments.¹ Consequently labor turnover at that time was studied as a problem of recruiting and handling men, and employment managers assumed the task of defining the concepts and methods of the new statistics.

"Manpower in war time" was the theme of the National Conference of Employment Managers held at Rochester, New York, in May 1918.² This conference was much concerned with the extensive shifting of labor and the consequent economic waste in the cost of hiring and training new employees. The practice of one enterprise "stealing" men from another by offering higher wages was asserted to be one of the forms of "destructive labor recruiting." The Secretary of Labor, addressing the conference, insisted on the necessity of avoiding competition among employers anxious to get workers from whatever source possible.³ The conference stressed the importance of current reports of labor turn-

¹ Paul F. Brissenden and Emil Frankel, "Mobility of Labor in American Industry," *Monthly Labor Review*, June 1920, p. 36.

² The problem of labor turnover had already been discussed in a more general way at the Conference of Employment Managers in Philadelphia in April 1917, but at that time the question was not yet so acute as it was to become a year later. See proceedings of the conference, April 2-3, 1917, in Bulletin 227 of the Bureau of Labor Statistics, October 1917, pp. 48-91.

³ An example may illustrate the labor market conditions which prevailed at that time as a result of labor shortages and of increased demand for labor by war industries. Shortly before the Rochester Conference, 30 of the largest firms affiliated with the Employers' Association of Detroit tried to reduce labor turnover by agreeing to discontinue advertising for help in Detroit papers for a month. Later this agreement was amended by the following provision: ". . . we will not send representatives of our employment department to the gates of other concerns or to the vicinity or location of other plants for the purpose of soliciting the labor of the employees of those concerns as they go [to] or leave their work." (*Monthly Labor Review*, January 1919, p. 29)

over in industry and established the procedure which has since been referred to as the "Rochester" method:

"Labor turnover for any period consists of the number of separations from service during that period. Separations include all quits, discharges, and lay offs for any reason whatsoever.⁴

"The percentage of labor turnover for any period considered is the ratio of the total number of separations during the period to the average number of employees on the force report during that period.

"It is recommended that the percentage turnover be computed for each week. All turnover percentages for a week or for any other period should always be reduced to a yearly basis and be reported in terms of percentages per annum. . . .

"In case the number employed by a plant . . . decreases because it is the deliberate policy of the plant management to reduce permanently its working force, this fact should be explicitly stated and the reasons for the reduction in force given."⁵

Soon after the conference Paul F. Brissenden and Emil Frankel suggested that the term "labor turnover" be used only with reference to the extent of replacements necessary for maintaining the working force. Accordingly, the labor turnover rate would be identical with the replacement rate and would equal either the accession or separation rate, whichever were the smaller, while all changes in the working force would be covered by the term "mobility of labor." It was also suggested that the general extent of "labor mobility" be measured by the "flux rate" (the sum of accessions and separations).⁶ These terms were widely used in labor turnover statistics before the 1930's, but have been abandoned since then.

TYPES OF SEPARATION

The Rochester resolution mentioned different types of separation (quits, discharges and layoffs) but did not insist on their separate enumeration. Employment managers at that time were

⁴ The terms "quit," "discharge" and "layoff" were not defined in the Rochester resolution. It was taken for granted that these terms were to be used in statistics exactly as they were used by employment managers. Cf. *Monthly Labor Review*, December 1929, p. 100; June 1931, p. 127.

⁵ *Ibid.*, June 1918, pp. 172-73.

⁶ *Ibid.*, June 1920, pp. 37-38. See also Paul F. Brissenden and Emil Frankel, *Labor Turnover in Industry* (New York: Macmillan Company, 1922), pp. 13-14.

primarily concerned with the voluntary quits of workers, and the question of the classification of separations by type did not become of practical importance until after the World War.

Since 1919 five series of labor turnover statistics have been computed—one for accessions and four for separations. The separation series show the rates of quits, discharges, layoffs, and of all separations.⁷

A "quit" is defined as a termination initiated by an employee. It may result from his dissatisfaction with work conditions or be due to other reasons, such as finding a more desirable position, returning to school, marriage, sickness, or family conditions. Separations due to the physical incapacity of an employee, permanent disability, superannuation, or death are likewise registered as quits.⁸

A "discharge" is a termination of employment initiated by an employer for reasons such as incompetence, misfit, violation of rules, dishonesty, insubordination, or laziness.⁹ A "layoff" is a termination of employment at the will of the employer, but without prejudice to the worker. It may be due to lack of orders or materials, breakdown of plant, change in product, reorganization, or release of temporary help—briefly, to a declining demand for labor by the employing concern.¹⁰

Beginning with January 1940, "miscellaneous separations" because of death, permanent disability, retirement on pension, etc., have been segregated from "quits." At the same time accessions have been classified in two groups: rehiring of workers after a separation of 3 months or less, and other hirings. It is likely that as time goes on this subdivision of accessions will contribute to a better understanding of industrial labor turnover.

⁷ For the preceding decade, only fragmentary reports on the distribution of separations by type are available. Cf. Sumner H. Slichter, *Turnover of Factory Labor* (New York: D. Appleton and Co., 1919), pp. 85-103.

⁸ *Monthly Labor Review*, December 1929, p. 100; June 1931, p. 127.

⁹ "Trouble breeding" was also mentioned as a reason for discharge in the *Turn-over Talks* prepared by the Metropolitan Life Insurance Company and published in *Monthly Labor Review*, July 1929, p. 99. But this term does not appear in the instructions for the standard procedure of compiling turnover statistics followed by the Bureau of Labor Statistics.

¹⁰ The working force of a concern may also be reduced without layoffs if management fails to replace workers who voluntarily quit or were discharged.

MEASUREMENT OF TURNOVER RATES

The weekly measurement of labor turnover suggested at Rochester was later abandoned for an enumeration of accessions and separations by calendar months, but the Rochester method for reducing monthly rates to a yearly basis was in general use until very recently. The soundness of this procedure is questionable, and in the present study only monthly rates are used.

The Rochester resolution was very clear as far as the measurement of labor turnover in individual establishments was concerned, but did not indicate how the average rates of turnover for an entire industry or for several industries should be computed. In the early surveys it was assumed that the turnover reports of several companies should be combined as if they referred to different departments of one concern, i.e., the total number of accessions and separations should be compared with the total working force of all reporting firms. Consequently, the rates of turnover computed at that time for different industries and localities were weighted averages of the rates reported by individual establishments. In the 1920's a simpler procedure of median rates was introduced, but since 1931 labor turnover statistics have been again based on weighted averages. Because of these changes in method, labor turnover statistics for the period from 1919 to 1929 cannot be combined in continuous series with data for the preceding or the following decade.

LABOR TURNOVER AND VARIATIONS IN EMPLOYMENT

Variations in labor turnover rates may be segregated into the same three component movements which are characteristic of employment indexes: (1) the main (or long-time) movement determined by trend and business cycle;¹¹ (2) seasonal changes; (3) non-seasonal short-time variations. The correlation between the labor turnover and employment series must reflect the relationship between these components, i.e., between the two seasonal rhythms, the two main movements, and the two sets of non-seasonal short-

¹¹ It is practically impossible to segregate the trend from the cycle influences in a statistical series which does not cover at least two cycles. And since the available labor turnover series refer to not more than 10 or 11 continuous years, it is hardly advisable to make a distinction between their secular and cyclical variations. Rather, both kinds of variation in each series are merged in its main movement.

time variations. Therefore, the main movement of one series should be compared with the main movement of the other, and the same method is applied to the short-time variations of the two series. A comparison of the varying extent of labor turnover with the changing level of employment demands, however, that the compared statistics refer to the same industries and the same areas.

In order to compare the two series, the following procedure is suggested: Let (a) be the monthly accession rate and (s) the separation rate, both being expressed in per cent of the average number of workers on the payrolls during the surveyed month. Then the difference ($d = a - s$) will express the rate of net change in the working force of reporting establishments. This rate will be positive and show the labor increase if (a) is larger than (s), and negative if (a) is smaller than (s). Except where there is a very sharp change in employment, the value ($100 + d$) may be regarded as a sufficiently accurate expression of employment at the end of the month, in per cent of that at the beginning of the month.¹²

In this way, if the monthly accession and separation rates are known for a longer period, a series showing approximate monthly variations in the working force of reporting concerns may be computed. In order to distinguish this series from the regular employment statistics, it may be called the "derived" employment index.

¹² The net balance of accession and separation rates indicates the change of employment in per cent of the average employment during the specified month. Assuming a gradual and even variation in employment, the basis of comparison for each month (100) is near the mean value of employment on the first of this month and on the first of the next following month, or 100 plus one-half of the net change of employment. If (d) is the net balance of accessions and separations as reported by labor turnover statistics, and Δ the change in employment in per cent of the number of persons on the payroll at the beginning of the month,

$$d = \frac{100\Delta}{100 + \frac{1}{2}\Delta} = \Delta - \frac{\Delta^2}{200 + \Delta} \dots\dots\dots (1)$$

and

$$\Delta = \frac{100d}{100 - \frac{1}{2}d} = d + \frac{d^2}{200 - d} \dots\dots\dots (2)$$

Accordingly (d) is always smaller than Δ , and ($100 + d$) smaller than ($100 + \Delta$). The difference is approximately 0.005 of 1 per cent when the monthly change of employment (or the monthly net balance of accessions and separations) is 1 per cent. It is somewhat more than 0.02 of 1 per cent when the monthly change (d) is 2 per cent, and approaches 0.045 of 1 per cent if (d) equals 3 per cent. When (d) is 5 per cent, the difference between (d) and Δ exceeds 0.1 of 1 per cent.

The following example illustrates the procedure :

Month	Accession rate (a)	Separation rate (s)	Net change in employment (d=a-s)	Percentage change in employment (100+d)	"Derived" employment index (employment at the end of each month, Jan. 1=100)
<i>In per cent of employment in each month</i>					
January	2.8	5.9	- 3.1	96.9	96.90
February	2.6	5.0	- 2.4	97.6	94.57
March	3.5	3.1	+ 0.4	100.4	94.95
April	5.2	2.5	+ 2.7	102.7	97.51

Disregarding its minor downward bias, the "derived" index of employment may be used as if it were based on direct employment reports. The correlations between this index and labor turnover may be established, the main movements may be segregated from the short-time changes, etc.

Whenever labor turnover rates are computed for an industrial group for which an employment index of the usual type is available, this index may be checked with the derived employment index. If both indexes were absolutely accurate, they would be very close to one another (except for slight downward deviations of the derived index which would reach 0.1 of 1 per cent when monthly net changes in employment approached 5 per cent). But since labor turnover as well as employment statistics are based on an imperfect sampling, complete agreement between the two is not very probable, and question is raised as to the extent and nature of the discrepancy between them. A large disparity indicates a bias in the sample used by one or both of the statistical sets. On the other hand, if the variations in employment indicated by the net balance of the reported accession and separation rates are about the same as those shown by the employment index or industrial censuses, this may be considered as an indication of the representativeness of the labor turnover statistics for the industrial group to which they refer.

AVAILABLE STATISTICS OF LABOR TURNOVER

The first records of labor turnover were collected by M. W. Alexander in 1912¹³ and W. A. Grieves in 1913.¹⁴ More inclu-

¹³ *Annals of the American Academy of Political and Social Science*, May 1916, Vol. LXV, p. 136.

¹⁴ Sumner H. Slichter, *op. cit.*, p. 18.

sive data were computed by Sumner H. Slichter for the United States Commission on Industrial Relations in the period from 1913 to 1916. Official statistics of labor turnover began with the investigation conducted by the Bureau of Labor Statistics in 1915 and 1916. It reported in a general way the extent of turnover during the period from 1910 to 1915 and in more detail for the years 1913 and 1914. The results of this inquiry, however, were not published at the time.

A few years later the changed situation in the labor market brought the problem of labor turnover into the headlines.¹⁵ The war was curtailing the supply of manpower in the nation and increasing the demand for it, and employers complained bitterly of labor shortages and the excessive turnover of the working force. After the National Conference of Employment Managers in Rochester, the Bureau of Labor Statistics made a new inquiry in 1918 on accessions and separations in industrial establishments. This investigation covered the 12-month period ending May 31, 1918, and its results were made available in a series of articles in the *Monthly Labor Review* in 1918 and 1919.¹⁶ Later, when publishing a summary of the findings of this investigation, the Bureau of Labor Statistics also released the data of the preceding inquiry. Some of the data were brought down to the end of 1919 by securing additional information through correspondence, and thus a survey for a 10-year period, from 1910 to 1919, was obtained.¹⁷

After 1920 the relationship between the supply of and demand

¹⁵ See "Partial Bibliography of Recent Articles on Labor Turnover," *Journal of the American Statistical Association*, June 1919, pp. 371-73; Paul F. Brissenden, "Labor Turnover—A Selected Bibliography," *Monthly Labor Review*, April 1927, pp. 188-203.

¹⁶ Boris Emmet, "Labor Turnover and Employment Policies of a Large Motor Vehicle Manufacturing Establishment," *ibid.*, October 1918, "Labor Turnover in Cleveland and Detroit," *ibid.*, January 1919; Paul F. Brissenden, "Labor Turnover in the San Francisco Bay Region," *ibid.*, February 1919; Emil Frankel, "Labor Turnover in Cincinnati," *ibid.*, March 1919; P. F. Brissenden, "Labor Policies and Labor Turnover in the California Oil Refining Industry," and W. F. Kirk, "Labor Turnover in Milwaukee," *ibid.*, April 1919; P. F. Brissenden, "Labor Turnover Among Employees of a California Copper Mining and Smelting Company," *ibid.*, May 1919; E. Frankel, "Labor Turnover in Chicago," *ibid.*, September 1919; P. F. Brissenden, "Employment Policy and Labor Stability in a Pacific Coast Department Store," *ibid.*, November 1919, "Employment Policies and Labor Mobility in a California Sugar Refinery," *ibid.*, December 1919.

¹⁷ P. F. Brissenden and E. Frankel, "Mobility of Labor in American Industry," *ibid.*, June 1920, pp. 36-56; and *Labor Turnover in Industry* (New York: Macmillan Company, 1922).

for labor changed radically. Labor turnover, which had declined to a very low point during the depression of 1921, increased somewhat with recovery and remained at a level which appeared more or less satisfactory from the point of view of employment management. The problem seemed to be solved, and the Bureau of Labor Statistics discontinued its investigations.

In January 1926, however, the Metropolitan Life Insurance Company, with the cooperation of several other organizations interested in labor market problems, began to collect current reports on separations and accessions in industrial establishments in different parts of the country.¹⁸ These statistics appeared quarterly in the *Monthly Labor Review*, beginning in 1927, and later they were amended by a survey which carried labor turnover rates back to the beginning of the year 1919.¹⁹ Since July 1, 1929 a continuing survey of labor turnover has been conducted by the Bureau of Labor Statistics.

The three series of labor turnover statistics (from 1910 to 1919, from 1919 to 1929, and from 1930 to the present time) differ not only in their origin, but also in the method of computing turnover rates. The rates computed for the 1920's by the Metropolitan Life Insurance Company were medians of rates reported by individual firms, while those computed by the Bureau of Labor Statistics for the preceding and the following periods were weighted arithmetic means. The method of weighted average rates was reestablished at the beginning of 1931 and the 1930 data were recomputed and made comparable with the more recent statistics, so that for this year two sets of figures are available. A comparison shows, however, that the two sets are essentially different, the weighted average rates being from 25 to 100 per cent and more above the median.²⁰ Although there is no evidence that the discrepancy between the two forms of averages for other years would have been as high, their disparity in 1930 is so large that it is impossible to use this year as the link between the two series.

¹⁸ Similar reports had been made since May 1925 by a number of Rhode Island manufacturers to the Bureau of Business Research at Brown University. Later the Rhode Island reports were incorporated in the labor turnover statistics of the Metropolitan Life Insurance Company.

¹⁹ *Monthly Labor Review*, March 1927, pp. 12-13; July 1929, pp. 64-65.

²⁰ *Ibid.*, April 1931, pp. 137-45; compare the turnover rates in this issue with those published in the February 1931 issue, pp. 105-09. Cf. Chapter V of the present study, pp. 44,49.

The group of firms reporting to the Bureau of Labor Statistics has been gradually expanded in recent years. In 1930 the survey covered about 1,000 factories, with a total of 1,250,000 to 1,500,000 workers on their payrolls; in June 1941 reports were secured from about 7,500 plants employing nearly 3,600,000 workers. In addition to the monthly rates of quits, discharges, layoffs, and accessions in all reporting firms, the survey of the Bureau shows separate turnover rates for a number of individual industries in which at least 25 per cent of the working force are included. In 1930 statistics were computed for eight industries (automobiles, boots and shoes, cotton manufacturing, iron and steel, slaughtering and meat packing, sawmills, foundries and machine shops, and furniture). In 1931 two industries were added to the list (bricks and men's clothing). From time to time the list has been further extended; it included 20 industries in 1937, 24 industries in 1938, 36 in 1940, and 39 in 1941.

In comparison with current labor turnover statistics, the early inquiries based on the experience of individual firms which happened to possess more or less complete payroll and turnover reports appear primitive, and their representativeness for the labor market as a whole is questionable.²¹ And yet they deserve attention for two reasons:

(1) The recent changes in the flow of the working force cannot be revealed by statistics which refer to a comparatively short period overwhelmingly dominated by the depression of the 1930's but are clarified by comparison with earlier data.

(2) Inquiries conducted before the inauguration of inclusive official statistics had the great advantage of small sample studies, i.e., they contain details which usually are not included in a large-scale program.

²¹ The survey of labor turnover from 1910 to 1919, published by the Bureau of Labor Statistics, was accompanied by this reservation: "The establishments from which the Bureau of Labor Statistics has 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 . . . In such establishments the instability situation is not likely to be so 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 give little thought to its control." (*Monthly Labor Review*, June 1920, p. 40)

CHAPTER III

TURNOVER IN A PERIOD OF EXTENSIVE DEMAND FOR LABOR (1910-1919)

BUSINESS CONDITIONS changed rapidly from 1910 to 1919, and the flow of the working force in the second half of the decade was different from that before the World War. However, the common characteristic of the rates of labor turnover during the entire period was that they were much larger than employment managers would have liked them to be.

EXTENT OF LABOR TURNOVER BY YEARS

Only fragmentary information is available on labor turnover in the decade of the World War. Statistics for the years 1913 and 1914, and for the period from June 1, 1917 to May 31, 1918, cover more than 100 establishments with 300,000 to 400,000 workers; for the rest of the decade the sample is so small that a great deal of discretion must be used in interpreting its returns.

The scope of available statistics and the extent of labor turnover in the covered establishments are shown in Table 1. The average monthly rates in this table are extremely high in comparison with present rates. Even if the years with larger than average turnover rates (1913, 1916, 1917 and 1918) are excluded, the average rate of accessions and separations for the remaining period was about 8 per cent per month.

Although the large turnover of workers between 1910 and 1919 caused considerable difficulty to employment managers, it presented certain advantages from a broader viewpoint. It facilitated the rapid absorption of new workers by industries and was favorable for the maintenance of flexibility on the labor market, frequent openings giving to each unemployed worker a good chance for reemployment. A worker who quit because he was dissatisfied with working conditions and had a better position in view did not consider himself as "unemployed" in the short interval between the two jobs. It is impossible to determine in each case the length of

TABLE 1. EXTENT OF LABOR TURNOVER FROM
1910 TO 1919, BY YEARS

Year	Scope of available statistics		Average monthly number per 100 workers ^c	
	Number of establishments	Average number of workers ^b	Accessions	Separations
1910	16	85,263	8.8	8.5
1911	24	109,653	7.3	7.3
1912	54	188,363	9.3	8.0
1913	113	399,449	11.3	11.3
1913-14 ^a	84	244,814	7.8	8.3
1914	162	373,287	6.8	7.3
1915	51	159,054	6.5	5.3
1916	20	94,803	11.6	9.0
1917	27	58,052	11.6	10.8
1917-18 ^a	176	305,901	17.3	16.8
1918	29	56,411	14.5	12.5
1919	19	42,632	7.5	7.0
Average 1910-19	—	—	9.5 ^d	8.7 ^d

^a For this 12-month period more detailed information is available.

^b The number of full-year labor hours divided by 3,000.

^c The reported annual rates per 3,000 labor hours, multiplied by 100 and divided by 12.

^d Excluding figures in italics.

Source: *Monthly Labor Review*, June 1920, p. 41.

the "waiting period" before he began to realize that he was out of work. If on the average this period was about two weeks, a temporary discrepancy of 4 to 5 per cent between the demand for and supply of labor could be absorbed by these floating reserves of the labor force.¹ In other words, the labor market was so flexible that a temporary lack of 1.0 to 1.5 million jobs would create no visible unemployment.

EXTENT OF LABOR TURNOVER BY MONTHS

The monthly variations in labor turnover from 1910 to 1919 were reported by only a few establishments, and there is no certainty that these establishments were representative. The reported accession and separation rates for each month are shown in section A of Appendix Table I, while section B shows the monthly changes in the number of workers on the payrolls of the reporting

¹ To a large extent these reserves consisted of casual workers who provided the floating ("unstable") working force for establishments. See pp. 23-28.

firms, according to the "derived" employment index discussed in Chapter II. The three series are plotted on Diagram I.²

(See Diagram I.)

A close positive correlation existed between the accession and separation rates, not only in their main movement as shown on Chart B (1),³ but also in their short-time variations as represented on Chart B (2) by the differences between the reported data and their main movement. This correlation is accounted for by the fact that the net changes in employment constituted but a small part—not more than 20 per cent—of labor turnover, and that its extent in each month was mainly determined by the number of replacements.

Independent of short-time variations, the extent of labor turnover was influenced during the decade by changes in the level of employment. In 1911 and between the summer of 1913 and the fall of 1914, when employment by the reporting firms was declining, labor turnover was comparatively small for that decade (monthly rates from 5 to 6 per cent). It increased in periods of swiftly expanding demand for labor.

This correlation becomes vague at the beginning of 1918. After having reached the peak in January-February 1918, the main

² Although the employment curve on Chart A of Diagram I is based on the reports of a very small number of establishments, it is supposed to represent the trend in employment not only for the firms reporting monthly labor turnover, but for all the concerns whose yearly reports are summarized in Table 1. The net changes in employment in each calendar year, resulting from the monthly difference between accessions and separations in firms for which such statistics are available, have been checked with the yearly figures in Table 1. It has been found that in the years 1910-13 and 1916-19, the two sets of figures agree fairly well. On the contrary, in 1914 and 1915 there was an appreciable discrepancy between them, and for these years the derived index of employment has been adjusted accordingly. The striking upward trend in the derived employment index is due mainly to the heavy weighting of the automobile industry, which grew rapidly in this decade. Employment in all manufacturing industries increased only by 44 per cent from 1910 to 1919.

³ The main movement is represented here by the 12-month moving averages. In order to assure an accurate centering of the moving averages opposite the corresponding members of the original series, the averages have been computed for 12-month periods including the central month, 5½ preceding months, and 5½ following months. Therefore, it would be more exact to say that the main movement is represented by the 12-month moving averages of the 2-item averages of the original series. (See W. S. Woytinsky, *Seasonal Variations in Employment in the United States* [Washington: Committee on Social Security of the Social Science Research Council, 1939], pp. 18-19.)

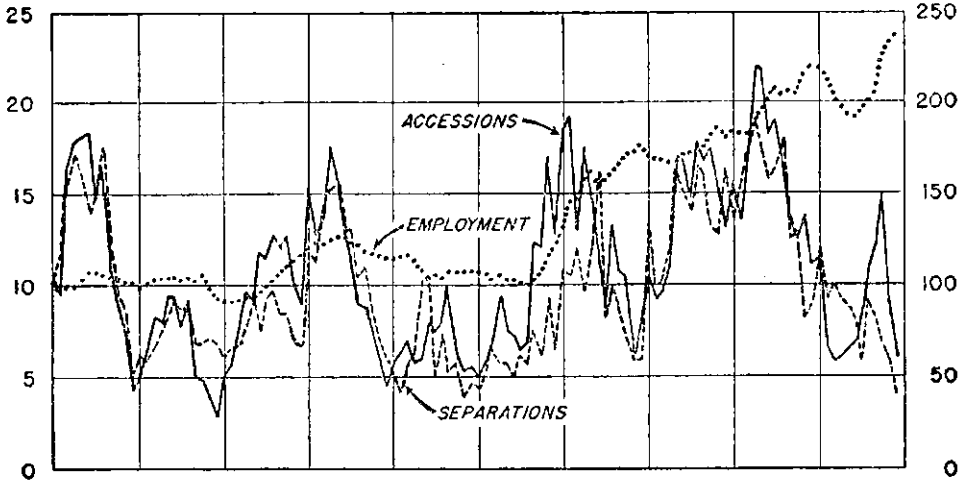
DIAGRAM I

TURNOVER OF LABOR FROM 1910 TO 1919, BY MONTHS

(A) LABOR TURNOVER RATES AND EMPLOYMENT BY REPORTING FIRMS

ACCESSION AND SEPARATION
RATES IN PER CENT

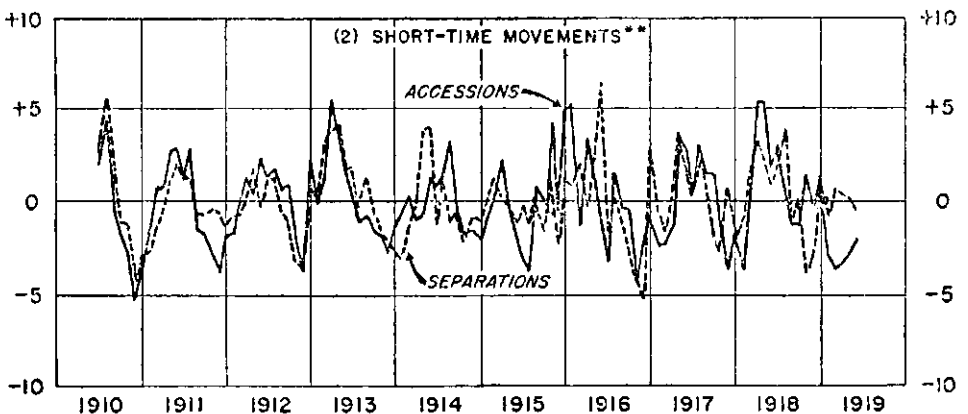
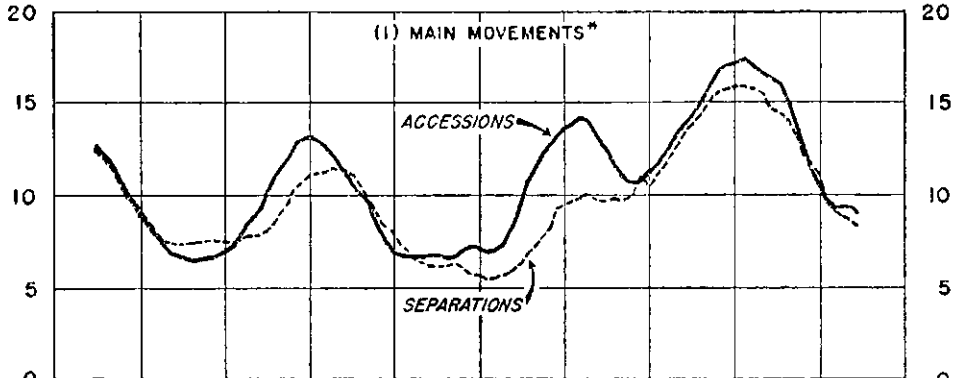
EMPLOYMENT
JANUARY 1, 1910=100



PER CENT

(B) ANALYSIS OF LABOR TURNOVER RATES

PER CENT



* 12-month moving averages of the reported data.

** Deviations from the 12-month moving averages.

separation and accession curves turned downward and returned in the summer of 1919 to the pre-war level, while the number of workers on the payrolls of reporting firms continued to increase. The discrepancy is probably due to a bias in the sample, inasmuch as the reporting concerns at this time were better off than the average. The crest of the demand for labor having passed and the labor market becoming more depressed with each month, turnover of the working force diminished in all industries, not excluding concerns which for some particular reason were not yet affected by the general downward trend.

The curves of short-time variations of accession and separation rates are closely tied to one another, but the amplitude of the variations of the accession curve is larger than that of the separation curve. There was a slight tendency of a greater growth in the number of accessions in months of particularly large turnover, and of a greater shrinkage in months when turnover lessened.

SEASONAL VARIATIONS

Both the accession and separation rates manifested a clear seasonal rhythm. Labor turnover was more extensive in summer than in winter. A rough measurement based on averaging the monthly data for all years from 1910 to 1919 indicates a peak in the second quarter and a trough in the fourth quarter, with a magnitude of variation of 6 per cent of the working force for accessions and of 5 per cent for separations.⁴ A closer analysis of the available data results in an index of seasonality with a smaller magnitude of variation and a slightly different timing of ups and downs.⁵

There was a considerable seasonal surplus of accessions in the autumn (from September to November) and of separations in the winter and early spring (from December to March), while in the summer the two movements in the reporting firms were approximately counterbalanced. This resulted in a peculiar seasonal rhythm in the volume of employment, with a wide, flat valley in the summer and a comparatively narrow winter peak, as repre-

⁴ See Brissenden and Frankel, *Labor Turnover in Industry*, p. 111.

⁵ Calculated as monthly averages of the deviations of reported rates from the 12-month moving averages for the whole surveyed period, except the erratic years 1913 and 1916.

sented on Chart B of Diagram II.⁶ Although observed in mining, some branches of manufacturing, wholesale and retail trade, and in services, this type of seasonality is not very usual and certainly not characteristic of the whole labor market.

Typical Seasonal Variations in the Extent of Labor Turnover in Reporting Establishments, 1910 to 1919

(Accession and separation rates in each month were larger (+) or smaller (—) than they would have been without seasonal influences, in per cent of the working force.)

Month	Accessions (a)	Separations (s)	Net change (a-s)
January	-1.2	-0.8	-0.4
February	-1.8	-1.0	-0.8
March	-0.4	-0.1	-0.3
April	+0.8	+0.6	+0.2
May	+1.3	+1.9	-0.6
June	+1.3	+1.1	+0.2
July	+1.0	+1.0	0.0
August	+1.7	+2.0	-0.3
September	+0.6	0.0	+0.6
October	-0.2	-1.1	+0.9
November	-0.6	-1.7	+1.1
December	-2.5	-1.9	-0.6

(See Diagram II.)

LABOR TURNOVER BY ESTABLISHMENTS, CITIES AND INDUSTRIES

The comparatively detailed surveys carried out in 1913-14 and 1917-18 showed that there was a tremendous diversity in labor turnover by individual establishments,⁷ cities and industries.

⁶ It should be kept in mind that the dotted curve on this Chart represents the typical seasonal variations in employment caused by the seasonal variations in labor turnover, but not the net balance of turnover for the specified months shown in the last column of the text tabulation on this page.

⁷ The reporting establishments were distributed by average monthly accession and separation rates, as follows:

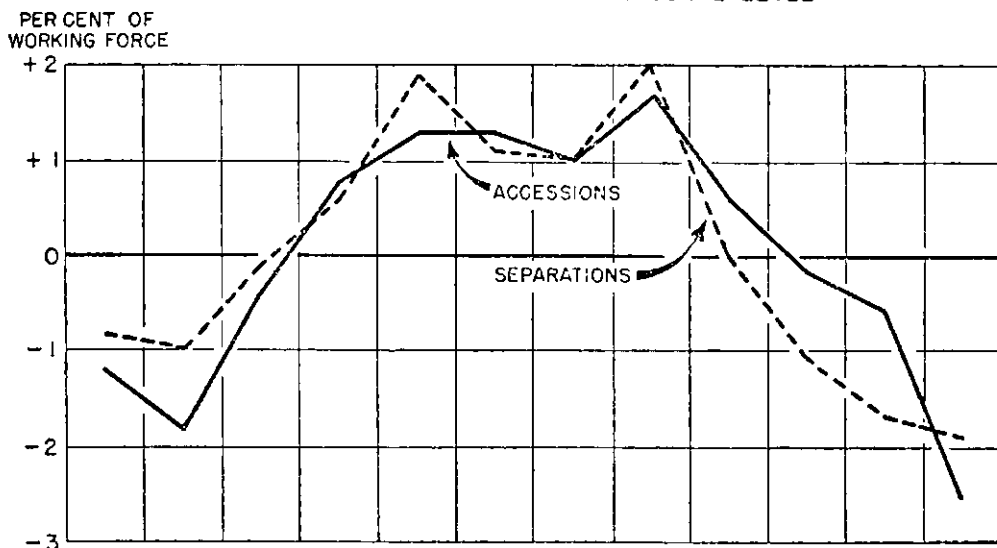
	Total	Number of establishments with the specified rate of accessions or separations						Over 40 per cent
		5 per cent and less	Over 5 to 10 per cent	Over 10 to 15 per cent	Over 15 to 20 per cent	Over 20 to 30 per cent	Over 30 to 40 per cent	
<i>1913-14</i>								
Classified by the rate of accessions	84	34	17	14	12	4	—	3
of separations	84	26	26	18	7	4	1	2
<i>1917-18</i>								
Classified by the rate of accessions	176	6	27	37	26	47	21	12
of separations	176	7	26	34	30	50	19	10

Source: Brissenden and Frankel, *Labor Turnover in Industry*, p. 63. Cf. Slichter, *op. cit.*, p. 22.

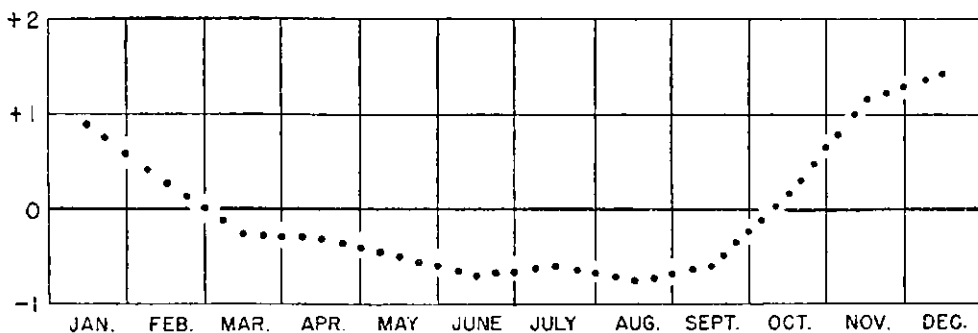
DIAGRAM II

TYPICAL SEASONAL VARIATIONS IN ACCESSION AND SEPARATION RATES, 1910 TO 1919

(A) DEVIATIONS FROM THE NON-SEASONAL LEVEL



(B) VARIATION IN EMPLOYMENT RESULTING FROM SEASONAL VARIATIONS IN THE NET BALANCE OF LABOR TURNOVER



Both in 1913-14 and 1917-18 turnover rates in large establishments were appreciably lower than in small firms.⁸ The explanation of this difference was sought in the employee welfare and service activities which are generally carried on more extensively by large establishments. It was also suggested that in the large establishments there were interdepartmental transfers not included in the turnover figures. The empirical basis of the two surveys was, however, too narrow to check the validity of these explanations,

⁸ Brissenden and Frankel, *Labor Turnover in Industry*, p. 55.

and statistics for more recent times have failed to confirm the theory of a correlation between the size of factory and the unwillingness of employees to quit.⁹

In 1913-14 average turnover rates were computed for seven cities, and for five of them comparable data for 1917-18 were available. The survey below shows the great diversity in the extent of labor turnover by locality.¹⁰ The striking difference in the ranking of individual cities by turnover rates in the two surveys might result from the fact that the reporting concerns were not identical in the two cases.

City	Monthly rate in per cent of the working force			
	1913-14		1917-18	
	Accessions	Separations	Accessions	Separations
Milwaukee	4.0	6.5	17.7	17.5
Boston	4.8	4.8	—	—
New York	5.2	5.3	—	—
Cleveland	7.0	7.3	21.2	20.8
Chicago	10.0	11.0	13.8	13.5
Cincinnati	10.2	9.5	13.8	13.3
Detroit	12.0	12.8	19.3	18.8

The differences between the extent of labor turnover by industries seem to be more stable. From the reports of the two surveys the following rates could be obtained:¹¹

Industry	Monthly rate in per cent of the working force			
	1913-14		1917-18	
	Accessions	Separations	Accessions	Separations
Public utilities:				
Gas and electricity.....	1.3	2.5	11.5	11.8
Street railways	2.3	2.3	6.8	8.0
Telephone	3.3	4.0	7.8	8.5
Clothing and textiles.....	5.3	5.5	10.5	11.8
Printing and publishing.....	5.8	5.5	14.8	15.8
Wholesale and retail trade.....	6.0	5.5	11.5	12.0
Miscellaneous metal products...	6.8	7.8	26.5	25.3
Furniture and millwork.....	—	—	20.8	25.5
Machinery	6.8	9.0	13.8	13.3
Chemical industries	10.0	8.8	24.8	21.0
Automobile and parts.....	13.0	13.5	19.3	19.0
Leather and rubber goods.....	13.3	11.2	20.0	20.5
Slaughtering and meat packing..	21.3	20.0	21.3	18.3

⁹ See pp. 59-60 and Appendix Table V.

¹⁰ Brissenden and Frankel, *op. cit.*, p. 47.

¹¹ Brissenden and Frankel, "Mobility of Labor in American Industry," *Monthly Labor Review*, June 1920, p. 44.

LABOR TURNOVER BY SKILL, SEX, AGE, AND WORKING
CONDITIONS

The labor turnover statistics of 1913-14 and 1917-18 showed that in all industries the turnover rate of unskilled laborers was considerably higher than that of skilled workers.¹² In ten industries the turnover of male workers in 1917-18 was larger than that of female workers, while the reverse relationship was characteristic of three industries. In the few factories which reported labor turnover rates classified by the ages of workers, the turnover of boys, young men, and girls was decidedly larger than that of the rest of the working force.¹³

The influence of labor conditions is evidenced by the striking contrast between the turnover rates for the day and night force employed by the same firms. In all establishments which supplied separate reports for the two groups of workers, the turnover of the night force was several times as large as that of the day force.¹⁴ Besides this, there were indications that the largest turnover was among the less attractive jobs where the workers were exposed to great heat or dirt or were underpaid.¹⁵

Turnover rates varied also by race and nationality of workers, their occupational background and the like.¹⁶

"STABLE" AND "UNSTABLE" WORKING FORCE

The problem of stable and unstable workers in industrial establishments was formulated by Brissenden as follows:

"What kinds of jobs are most frequently abandoned? What kinds of employees most frequently abandon them? Obviously it is the unskilled job. And just as obviously it is the newly hired employee rather than the veteran in the shop. Heavy labor turn-over is a fact because the 10-day man is a fact—and the 1-day man. But what are the exact proportions of a shop's aggregate turn-over chargeable to

¹² Cf. Slichter, *op. cit.*, pp. 57-74.

¹³ Slichter, *op. cit.*, pp. 76-84. Cf. P. Sargant Florence, *Economics of Fatigue and Unrest and the Efficiency of Labour in English and American Industry* (New York: H. Holt and Co., 1924), pp. 174-75.

¹⁴ Brissenden and Frankel, *Labor Turnover in Industry*, pp. 71, 107.

¹⁵ Slichter, *op. cit.*, pp. 74-76.

¹⁶ A typical example is quoted by Florence (*op. cit.*, p. 174). A Philadelphia firm reported an annual turnover rate of 215 per cent for its native-born workers, 180 per cent for Italians, and 310 per cent for Negroes. Italians quit in the spring and migrated West, while Negroes quit in the autumn and went South for the cotton picking.

the 10-day men and the 1-day men respectively? And what proportion of the standard number of positions in any establishment are infested by 10-day men and what proportion by 1-day men, and so on?"¹⁷

After twenty years of progress, labor turnover statistics have not yet provided a basis for definite answers to these questions. But some light has been cast on the relative importance of the stable and unstable groups in the working force of establishments and their respective turnover rates.

In 1913-14, 34 concerns with 86,400 employees, and in 1917-18, 53 firms with 71,800 employees furnished figures on the length of service of workers who had left their employ during the 12-month period, and of those who were on their payrolls at the end of this period.¹⁸ Their reports are summarized in Table 2.¹⁹

The canvassed firms reported a total of 54,600 separations in 1913-14 and 93,100 separations in 1917-18. In 1914, 47.9 per cent and in 1918, 36.6 per cent of the personnel on the payrolls of reporting firms were continuously employed by the same establishments for 3 years or more, while the proportion of separated employees with this length of service in the two observation periods was only 6.7 and 6.2 per cent. On the other hand, the newly hired workers, with service of not more than 3 months, constituted 13.1 per cent of the whole personnel in 1913-14, and 18.7 per cent in 1917-18, while their part in separations in the same periods was 52.0 per cent and 60.8 per cent.²⁰

In interpreting the computed data, the Bureau of Labor Statistics assumed that during the whole year the personnel of the reporting establishments was distributed by length-of-service groups in approximately the same proportion as at the end of the year. Although the differential turnover rates calculated on this assumption are very rough (especially with regard to the newly hired workers), they reveal clearly enough the general tendency for

¹⁷ *Monthly Labor Review*, February 1919, p. 45.

¹⁸ There is obviously a methodological inconsistency in comparing the distribution by length of service of the workers separated during a year with a similar distribution of the working force at a given date. Since the latter distribution might vary considerably during the year, the *average* distribution of the employees by length of service would serve the purpose better. In retrospective studies, however, there is no other choice than to use the available data in spite of their methodological shortcomings.

¹⁹ It should be kept in mind that this table is based on very small samples and that the representativeness of the reporting firms may be questioned.

²⁰ See Table 2.

TABLE 2. LENGTH-OF-SERVICE DISTRIBUTION OF ACTIVE AND SEPARATED EMPLOYEES, 1913-14 AND 1917-18

Length of service	1913-14		1917-18	
	On payroll	Separations	On payroll	Separations
TOTAL.....	100.0	100.0	100.0	100.0
1 year or less.....	28.8	81.3	39.7	83.9
1 month or less.....	5.4	29.0	8.9	40.5
Over 1 to 2 months.....	4.2	15.0	5.8	13.5
Over 2 to 3 months.....	3.5	8.0	4.0	6.8
Over 3 to 4 months.....	2.9	6.0	3.2	5.2
Over 4 to 5 months.....	2.4	5.0	2.7	4.0
Over 5 to 6 months.....	2.1	4.6	2.5	3.4
Over 6 to 7 months.....	1.8	3.5	2.4	2.9
Over 7 to 8 months.....	1.6	2.9	2.3	2.4
Over 8 to 9 months.....	1.4	2.4	2.2	1.9
Over 9 to 10 months.....	1.25	2.0	2.1	1.4
Over 10 to 11 months.....	1.15	1.6	1.9	1.1
Over 11 months to 1 year.....	1.1	1.3	1.7	0.8
Over 1 to 2 years.....	12.1	8.1	14.6	7.1
Over 2 to 3 years.....	11.1	4.0	9.2	2.7
Over 3 to 4 years.....	8.5	2.2	5.2	1.8
Over 4 to 5 years.....	6.5	1.2	3.6	1.2
5 years or more.....	32.9	3.3	27.8	3.2

Source: Brissenden and Frankel, "Mobility of Labor in American Industry," *Monthly Labor Review*, June 1920, p. 51. The original data have been interpolated in this table.

separation rates to decline as length of service increases, as shown below:²¹

Among employees with continuous service of	Monthly separation rates in per cent	
	1913-14	1917-18
1 year or less.....	15.0	23.0
1 but less than 2 years.....	3.5	5.2
2 but less than 3 years.....	2.0	3.1
3 but less than 4 years.....	1.3	3.5
4 but less than 5 years.....	0.8	3.0
5 years or more.....	0.5	1.1
AVERAGE, ALL GROUPS.....	5.3	10.8

The statistics of the length-of-service distribution of active and separated employees can be used for the purpose of segregating the working force of reporting concerns into two groups—stable and unstable. It should be recognized, however, that each group of workers is stable when compared to groups with greater turnover, and unstable when compared to workers who are less inclined to change jobs. If the turnover rates of the *more* stable

²¹ A more refined method of measuring turnover in different length-of-service groups has been worked out by English investigators. See P. Sargant Florence, *op. cit.*, pp. 171-74.

and the *less* stable sections of the working force varied gradually and smoothly with length of service, there would be no point in making a distinction between the two groups. But because there is a sharp contrast in the turnover of the newly hired and other workers, it is important to distinguish between them.

The Bureau of Labor Statistics proposed that the borderline between stable and unstable workers be drawn at 12 months of continuous service. This suggestion can be accepted with one reservation. If all workers who are continuously employed by the same firm for at least a year are considered as stable, this should not mean that all persons on payroll less than a year belong to the unstable group. Among the latter are workers who, while hired less than a year before, may have remained with their new employer and are therefore potentially stable workers although their short record of service would, according to the proposed classification, imply that they belong to the unstable group.

If there were no considerable changes in the number of workers on the payroll of the reporting concern, and if the newly hired stable employees had the same turnover rate as those with continuous service of 1 to 2 and of 2 to 3 years, the number of individuals in these three consecutive length-of-service classes would diminish, approximately by the rule of geometric progression. For example, 100 persons in the first class would correspond to 90 persons in the second and 81 in the third class. Therefore, if an establishment reports 250 persons with less than 1 year of service, 90 with 1 to 2 years and 81 with 2 to 3 years of continuous service, the unstable group would not include all of the 250 workers hired during the last 12 months, but only 150 of them (the difference between the 250 hired and the 100 potentially stable workers). The probable size of the unstable group would be further diminished if there is evidence that the group of less-than-1-year men includes workers newly hired because of an increasing demand for labor by the reporting firm. The unstable or floating part of the working force being determined in this way, the terminations of employment accounted for by the potentially stable group should be subtracted from the total number of separations, and thus the turnover of the unstable group will be found.

The described procedure has been applied to the data of the 1913-14 and 1917-18 surveys in the following pages.

Among the employees of the reporting concerns, there were at the end of the surveyed 12-month period: ²²

Length of service	1913-14	1917-18
1 year or less.....	28.8 per cent	39.7 per cent
1 to 2 years.....	12.1 per cent	14.6 per cent

The group of stable employees among those with less than 1 year of continuous service may be tentatively estimated from Table 2 by using the rule of geometric progression and smoothing the irregularities in the reported figures. It is found that this group amounted to 17 or 18 per cent of the working force in 1913-14 and to 24 or 25 per cent in 1917-18. Furthermore, account should be taken of the fact that employment was increasing in the 12-month period 1917-18, while it remained fairly steady in 1913-14. After excluding the potentially stable workers from the number hired during the preceding 12 months (28.8 per cent in 1913-14 and 39.7 per cent in 1917-18), it will be found that the unstable group in both years constituted probably from 11 to 12 per cent of the working force, or 9,500 workers in 1913-14 and about 8,000 in 1917-18.²³

In this way the following tentative distribution of employees in the reporting establishments by stable and unstable groups is found:

	1913-14	1917-18
Working force at the end of the 12-month period...	86,400	71,800
Unstable group	9,500	8,000
Stable group	76,900	63,800
Separations in the 12-month period.....	54,600	93,100
Unstable group	38,200	67,100
Stable group	16,400	26,000
Monthly separation rate, in per cent		
All workers	5.3	10.8
Unstable group	33.5	70.0
Stable group	1.8	3.4

The situation varied from industry to industry. In 1913-14 no floating group could be disclosed in the clothing and textile factories, printing and publishing, street railways and telephone service, while in leather and rubber goods factories the unstable group constituted about 10 per cent of the manpower; in automobile pro-

²² See Table 2.

²³ It should be emphasized once more that the two surveys differed considerably in the industrial distribution of the reporting firms, their size, and the like. There is no evidence of their representativeness for all manufacturing industries.

duction, machinery, miscellaneous metal products, and wholesale and retail trade it amounted to 20 to 25 per cent; and in the chemical industry (one reporting concern), to more than 40 per cent. In 1917-18 the floating group could be observed in all industries except clothing and textiles, printing and publishing, and telephone service. In most cases this group was not much larger than in 1913-14, and in machinery manufacturing it was decidedly smaller. As in the earlier survey, the largest floating group of workers in 1917-18 was found in chemical industries.

It appears that at that time there was a very large number of floaters on the payrolls of industrial establishments in both surveys. It is not quite clear whether these floaters constituted a distinct group within the working population or whether the same individuals belonged intermittently to the stable group and the unstable group. In any case, if there was a more or less definite group of floaters among workers, their total number in the working population would certainly be larger than the length-of-service statistics reveal. Indeed, only a part of the floaters are employed by industrial establishments at any one time, while the rest of them are moving from job to job. If in 1914 and 1918 more than 10 per cent of the persons on the payrolls of reporting establishments were unstable workers with respective turnover rates of 33.5 and 70 per cent per month, and if these establishments were more or less typical, the absolute number of floaters employed by all industries might have reached 2 or 3 millions, and the total number of separations and replacements in this group might have been about 1 million per month in 1913-14 and twice as much in 1917-18. Obviously such a large turnover suggests that at any time during these years many floaters were in the process of changing jobs. While there was no indication of their actual number, it might have run into hundreds of thousands, with considerable variations from month to month.

CHAPTER IV

TURNOVER IN A PERIOD OF INCREASING LABOR MARKET RIGIDITY (1919-1929)

IN THE 1920's the rates of labor turnover dropped to less than half of the pre-war level. The flow of the working force was still dominated by separations initiated by employees, but there were fewer floaters in establishments, their turnover rate was considerably reduced, and there were indications of an increasing reluctance on the part of workers to quit their jobs. Yet the number of quits was sufficient to permit employers to adjust their working force to minor fluctuations in business conditions without layoffs and discharges. In type and extent of labor turnover, the 1920's constituted a transition between the preceding and following decades.

EXTENT OF LABOR TURNOVER BY YEARS

Information on labor turnover was collected in the 1920's by the Metropolitan Life Insurance Company through its Policyholders Service Bureau, with the assistance of several universities and other agencies.¹ The number of reporting firms was 175 at the beginning of 1927, about 300 at the end of the same year, and 600 in 1929. In contrast with previous investigations, the survey was restricted to manufacturing industries.

The figures published by the Metropolitan Life Insurance Company as "average" turnover rates were calculated as follows: For each reporting concern the rates of accession, quit, discharge, and layoff were computed in accordance with the Rochester method.² Each of the resulting sets of rates was then arrayed in order

¹ By 1929 the following agencies were cooperating: Brown University, Indiana University, Ohio State University, Rutgers University, University of Denver, University of Michigan, Connecticut Industrial Council, Illinois Industrial Commission, Brooklyn Chamber of Commerce, Associated Industries of Massachusetts, Employers' Association of New Haven, Manufacturers' Association of the City of Bridgeport, and Manufacturers' Association of Meriden. (See W. A. Berridge, "Labor Turnover in American Factories," *Monthly Labor Review*, July, 1929, p. 63.)

² See page 7.

of magnitude, and the median item of each set was regarded as characteristic of the month. The total separation rate was calculated as the sum of the median quit, discharge, and layoff rates for each month.

The median rates were supposed to be "the most reliable and significant form of average for the purpose at hand." It was found also that "the median rate successfully controls the influence of extremely high or low rates, and that of companies having unusually large work forces; it tends to approximate the mode or normal; it is easily determined; and it seems to avoid some of the difficulties arising from a changing size of sample."³ However, these arguments are not conclusive. It seems unreasonable to give equal weight to a concern with 10,000 workers and a shop with 10 employees. And since the extent of labor turnover varies very widely from establishment to establishment,⁴ there is no evidence that the median rates in most cases would be representative for the industry as a whole. If there are many small firms with larger than average turnover, the median would be higher than the weighted average; and if the turnover in small firms is comparatively low, the median would be lower. It is possible also that separation and accession rates would not be identically affected by the method of computing the averages.

It seems, however, that in the beginning the disparity between the median and the weighted average rates was not very large. For the year 1919 the Bureau of Labor Statistics established, on the basis of a very small sampling, an average accession rate of 7.5 per cent and an average separation rate of 7.0 per cent per month. (See Table 1.) The median rates computed for the same year by the Metropolitan Life Insurance Company were 10.1 and 7.5 per cent. (See Table 3.)

The extent of labor turnover from 1919 to 1929, according to the reports of the Metropolitan Life Insurance Company, is shown in Table 3. Even a cursory examination of the reported figures shows that they are not exactly representative of all manufacturing industries in the nation. Indeed, a comparison of the rates of

³ W. A. Berridge, "Factory Labor Turnover—Two New Monthly Indexes," *Monthly Labor Review*, March 1927, p. 9.

⁴ See page 20, footnote 7.

TABLE 3. EXTENT OF LABOR TURNOVER FROM 1919 TO 1929
(Median monthly rates per 100 workers)

Year	Accessions	Separations			
		Total	Quits	Discharges	Layoffs
1919	10.1	7.5	5.8	1.1	0.6
1920	10.1	10.3	8.4	1.1	0.8
1921	2.7	4.4	2.2	0.4	1.8
1922	8.0	5.3	4.2	0.7	0.4
1923	9.0	7.5	6.2	1.0	0.3
1924	3.3	3.8	2.7	0.5	0.6
1925	5.2	4.0	3.1	0.5	0.4
1926	4.6	3.9	2.9	0.5	0.5
1927	3.3	3.3	2.1	0.5	0.7
1928	3.7	3.1	2.2	0.4	0.5
1929	4.4	3.8	2.7	0.5	0.6

Source: *Monthly Labor Review*, July 1929, pp. 64, 65; February 1931, p. 105.

(See Diagram III.)

separation and accession indicates the following net changes in the working force of the reporting factories in each year (in per cent of the number of workers at the beginning of the year) :

1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
+31.0	-1.8	-19.5	+32.6	+18.3	-5.6	+13.8	+7.3	+0.4	+7.4	+7.1

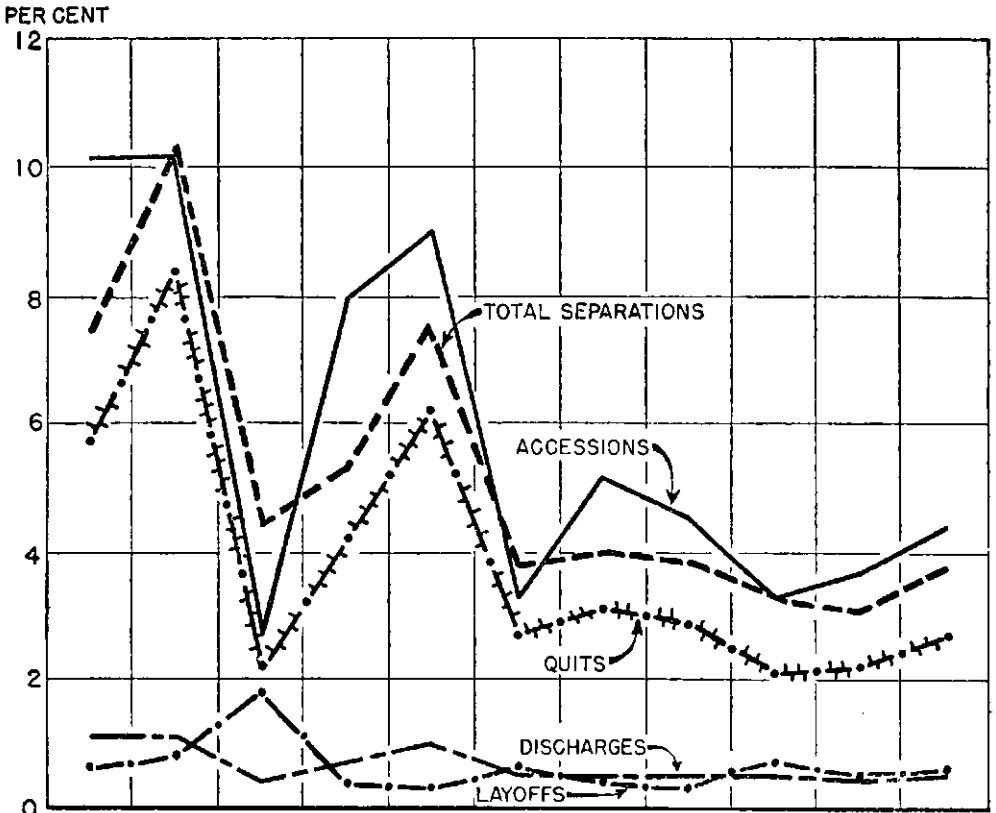
A derived index of employment, computed in accordance with these rates of net change in the number of persons on the payrolls of reporting firms, shows that these firms more than doubled their working force between January 1919 and December 1929, yet all factory employment in the United States at the end of this period was approximately the same as at the beginning. Unless there were some fundamental errors in the reports, this expansion in working force may have been due to the fact that the reporting concerns had greater business success than other American firms. Except for this possibility, it is likely that the short-time ups and downs in labor turnover in the reporting concerns were determined by the same factors which dominated the whole labor market.

The accession and total separation curves on Diagram III-A are closely tied to each other. Except for minor deviations, the turnover rates ascend and descend simultaneously, reflecting the variations in factory employment (Diagram III-B). This correlation becomes particularly striking if the main movement of acces-

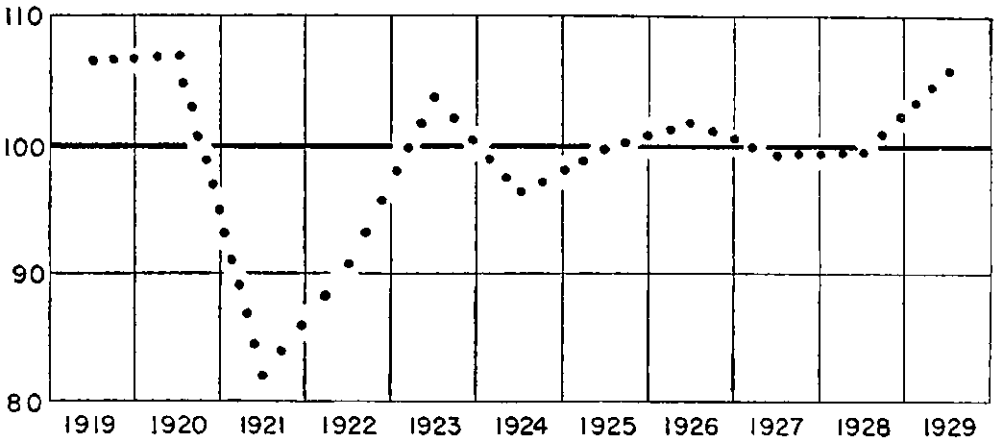
DIAGRAM III

TURNOVER OF LABOR IN MANUFACTURING INDUSTRIES FROM 1919 TO 1929, BY YEARS

(A) AVERAGE MONTHLY TURNOVER RATES



(B) FACTORY EMPLOYMENT (AVERAGE 1923-1925 = 100)



sion and separation rates is segregated from their short-time variations, as on Diagram IV.⁵

The downward trend in labor turnover rates in the 1920's is explained by the well known state of the labor market. The demand for labor by industries did not decline in this period, but neither did it grow sufficiently to absorb the growth in the working population. Thus unemployment continuously grew, and this tended to decrease the turnover of labor.

The annual deviations of accession and separation rates from the respective trends, shown on Diagram IV-B, followed closely the variations in factory employment.

EXTENT OF LABOR TURNOVER BY MONTHS

Variations in the extent of labor turnover from month to month in manufacturing industries are shown in Appendix Table II and on Diagram V. Chart B (1) of Diagram V reveals a lag between the upward and downward turns in the main movement of monthly accession and separation rates, the separation rate trailing similar variations of the accession rate.⁶ There is no lag between the short-time variations of the two series.

The lowest panel of Diagram V shows that with declining labor turnover, the magnitude of the short-time variations in turnover rates also diminished. In the period 1925-28 factory employment was comparatively steady and separations were fairly well counter-balanced by accessions both in their main movement and short-time variations. The extent of factory labor turnover from the fall of 1923 was moderate (in comparison with past times) and did not vary much from year to year or from month to month.

⁵ The trend of both series is not straight-linear and the series are not long enough to apply the moving average method. In Diagram IV the trend of the two curves is represented by second degree parabolas fitted according to the rule of the least squares. The equations of the regression lines representing the trends from 1919 to 1929 are:

$$Y = 11.240 - 1.472 X + 0.075 X^2 \text{ (for accession rates) and}$$

$$Y = 9.700 - 1.178 X + 0.055 X^2 \text{ (for separation rates)}$$

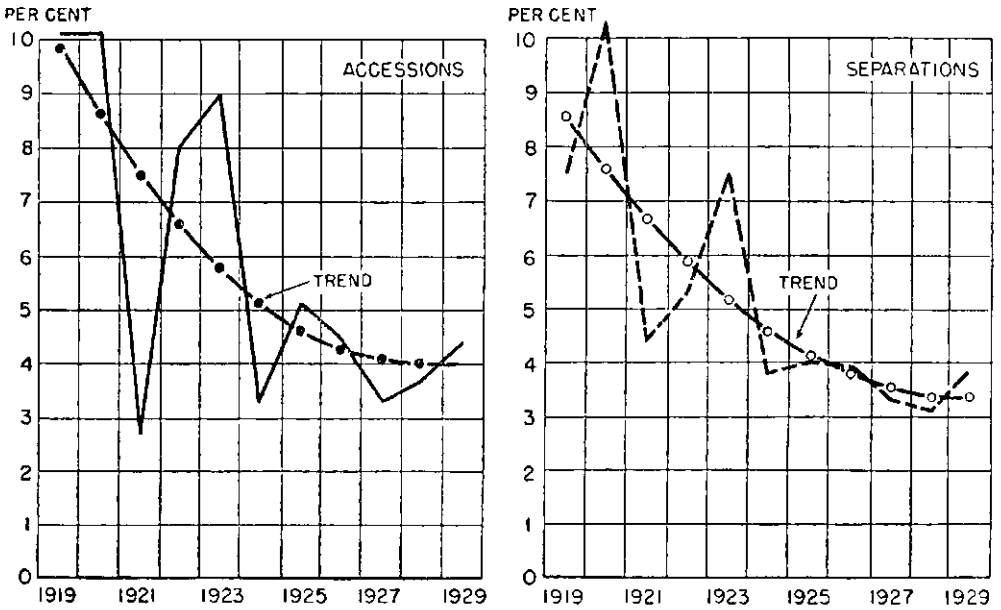
where X represents the order of the years, beginning with 1919 as 1, 1920 as 2, etc.

⁶ This relationship is observed in the main movements of the two series at the beginning of 1920, in the summer of 1921, in the spring of 1923, the summer of 1924, the winter of 1925-26, the winter of 1927-28, and in 1929.

DIAGRAM IV

TREND AND YEARLY VARIATIONS IN ACCESSION AND SEPARATION RATES IN MANUFACTURING INDUSTRIES, 1919 TO 1929

(A) AVERAGE MONTHLY TURNOVER RATES AND THEIR TRENDS



(B) ANALYSIS OF MONTHLY TURNOVER RATES

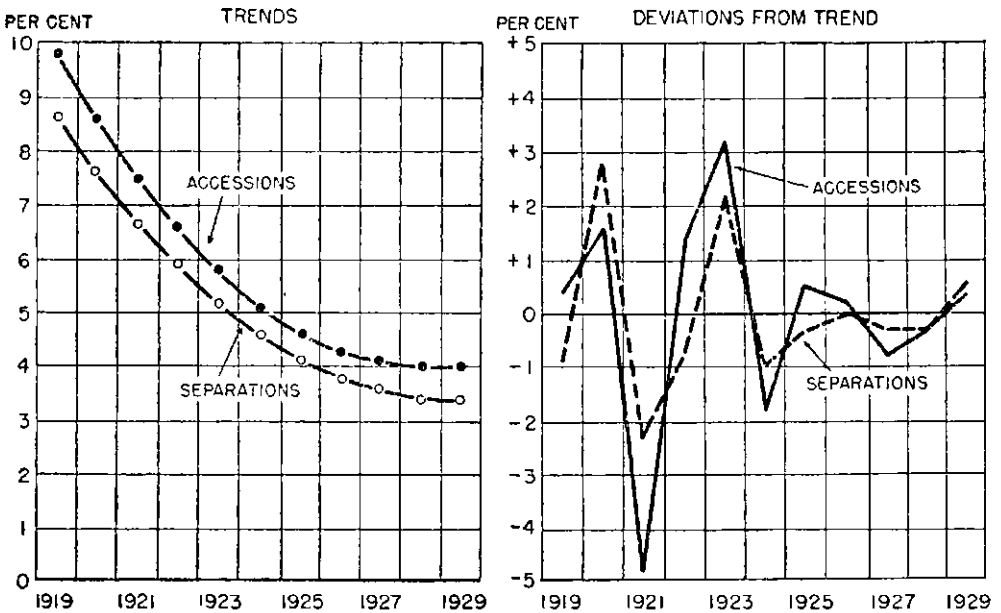


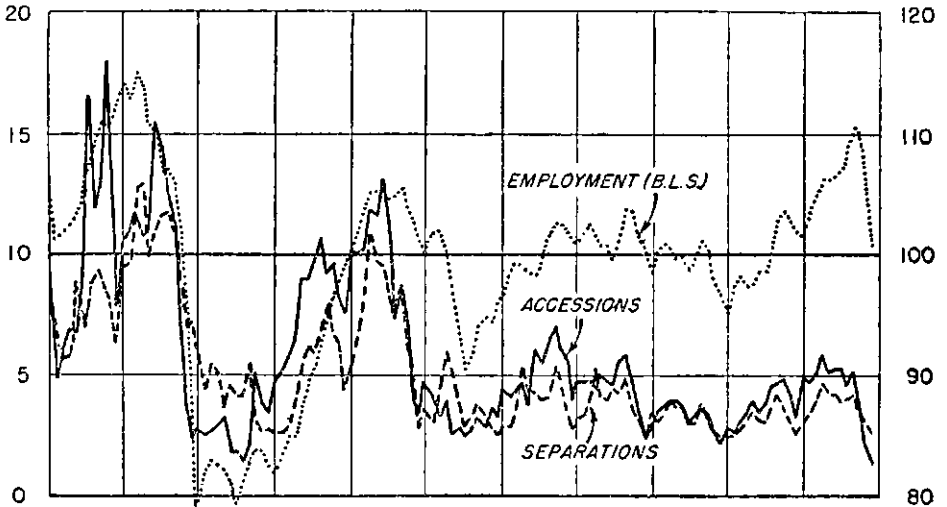
DIAGRAM V

TURNOVER OF LABOR IN MANUFACTURING INDUSTRIES FROM 1919 TO 1929, BY MONTHS

(A.) LABOR TURNOVER RATES AND FACTORY EMPLOYMENT

ACCESSION AND SEPARATION RATES IN PER CENT

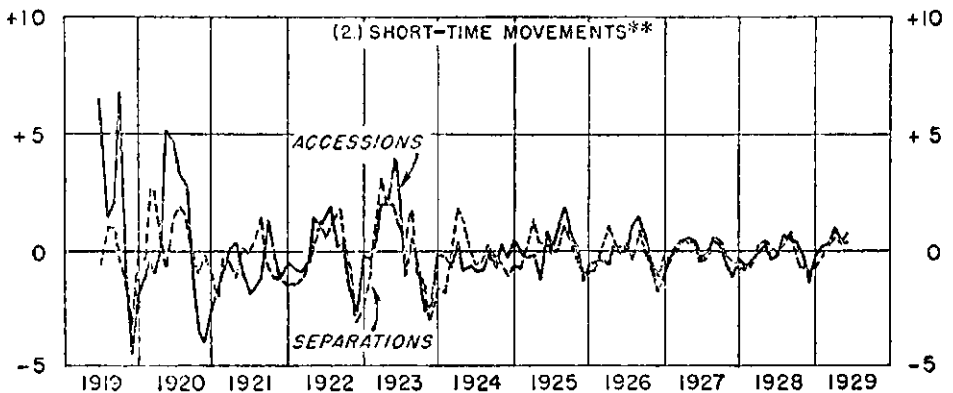
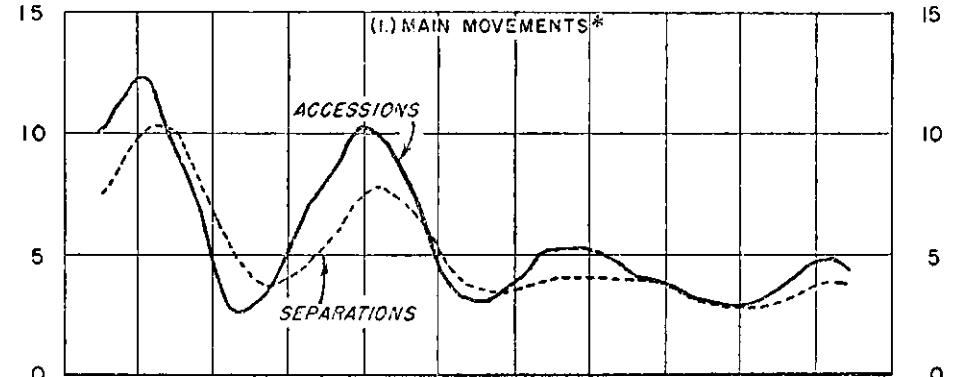
EMPLOYMENT (AVERAGE FROM 1923 TO 1925=100)



PER CENT

(B.) ANALYSIS OF LABOR TURNOVER RATES

PER CENT



* 12-month moving averages of the reported data.

** Deviations from the 12-month moving averages.

DISTRIBUTION OF SEPARATIONS

If the 11 years from 1919 to 1929 are segregated into three partly overlapping 5-year periods, the following percentage distribution of reported separations by type in each of these periods is observed: ⁷

Type of separation	1919-23	1922-26	1925-29
TOTAL	100.0	100.0	100.0
Quits	76.6	78.0	71.8
Discharges	12.3	13.1	13.3
Layoffs	11.1	9.0	14.9

As quits constituted about three-quarters of all the terminations of employment, the total separation rate followed the number of quits. However, the layoff rate was relatively more variable than that of quits. The variability of the three types of separations may be measured by the deviation of the respective rates from their 12-month moving averages: ⁸

Type of separation	Average monthly rate in per cent of the working force	Average deviation from the 12-month moving average	Average deviation in per cent of the average monthly rate
Quits	3.88	0.85	22
Discharges	0.64	0.09	14
Layoffs	0.65	0.20	32

SEASONAL VARIATIONS

As shown by the data on page 37, seasonal variations in the extent of labor turnover in the period from 1919 to 1929 were similar in conformation to those in the preceding decade, but of minor magnitude. Turnover rates were larger in summer than in winter, the magnitude of variation being about 2.5 per cent of the working force, both for accessions and separations.

⁷ See Table 3.

⁸ See Appendix Table II.

Typical Seasonal Variations in the Extent of Labor Turn-over in Factories, 1919 to 1929^a

(Accession and separation rates in each month were larger (+) or smaller (-) than they would have been without seasonal influences, in per cent of the working force.)

Month	Accessions (a)	Separations (s)	Net change (a-s)
January	-0.40	-0.80	+0.40
February	-0.40	-0.90	+0.50
March	-0.20	0	-0.20
April	0	+0.70	-0.70
May	+0.30	+0.40	-0.10
June	+0.30	+0.35	-0.05
July	+0.60	+0.25	+0.35
August	+0.90	+0.50	+0.40
September	+0.90	+1.20	-0.30
October	+0.40	+0.05	+0.35
November	-0.70	-0.60	-0.10
December	-1.70	-1.15	-0.55

^a The seasonal indexes are computed by averaging the differences between the reported data and the 12-month moving averages of 2-item averages from 1919 to 1929, except for the period from July 1919 to June 1920 and the calendar year 1923.

(See Diagram VI.)

The seasonal variation in factory employment which corresponds to this rhythm in accession and separation rates is expressed by the following set of figures (in per cent of the working force):

January	-0.10	July	+0.15
February	+0.45	August	+0.40
March	+0.15	September	+0.05
April	-0.45	October	0
May	-0.40	November	+0.10
June	-0.10	December	-0.35

The movement was small in amplitude (not more than 1 per cent of the working force) but remarkable in regularity, and its general rhythm agreed well with the seasonal rhythm of the factory employment index of the Bureau of Labor Statistics.⁹

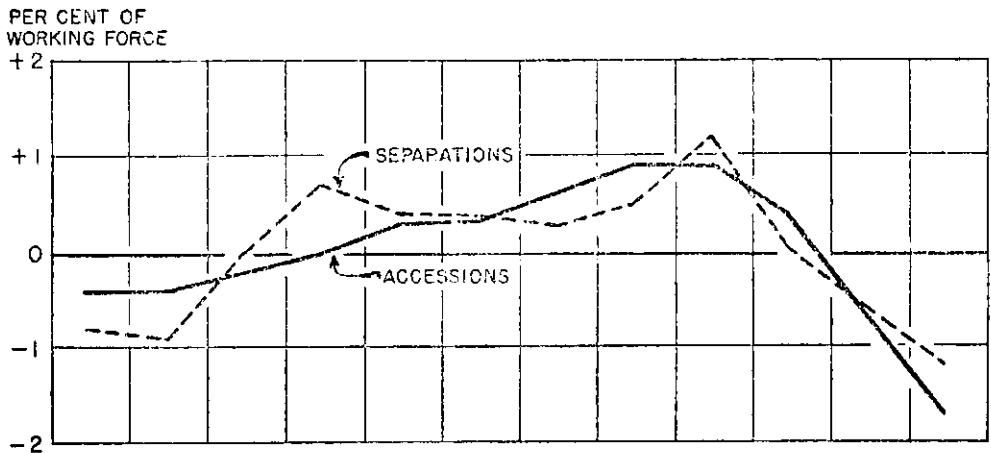
The seasonal ups and downs in the total separation rate were accounted for mainly by the changing extent of voluntary quits. The seasonal index of the quit rate constitutes a rather regular curve with a valley in winter and two peaks, the main one in autumn and the secondary one in spring. A similar rhythm of a minor magnitude is characteristic of the variation in the discharge

⁹ See Woytinsky, *Seasonal Variations in Employment*, pp. 50 ff.

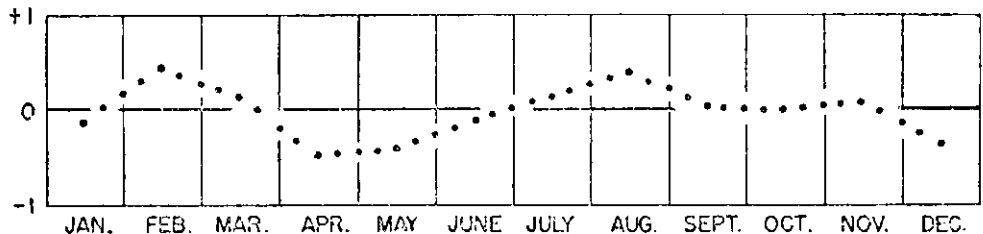
DIAGRAM VI

TYPICAL SEASONAL VARIATIONS IN ACCESSION AND SEPARATION RATES IN MANUFACTURING INDUSTRIES, 1919 TO 1929

(A) DEVIATIONS FROM THE NON-SEASONAL LEVEL



(B) VARIATION IN EMPLOYMENT RESULTING FROM SEASONAL VARIATIONS IN THE NET BALANCE OF LABOR TURNOVER



rate, while the seasonal peak of layoffs occurs in winter and their valley in summer.¹⁰

¹⁰ The indexes of typical seasonal variations in quit, discharge, and layoff rates in the period from 1919 to 1929, presented below, are computed in the same way as those of seasonal variations in accession and total separation rates given on page 37, and show to what extent the quit, discharge, and layoff rates in each month are larger (+) or smaller (-) than they would have been without seasonal influence. They are expressed in per cent of the working force.

Month	Quit	Discharge	Layoff
January	-0.95	-0.05	+0.20
February	-0.85	-0.05	0
March	-0.10	+0.05	+0.05
April	+0.65	+0.10	-0.05
May	+0.50	0	-0.10
June	+0.40	0	-0.05
July	+0.45	0	-0.20
August	+0.65	0	-0.15
September	+1.20	+0.05	-0.05
October	+0.10	+0.05	-0.10
November	-0.75	-0.05	+0.20
December	-1.30	-0.10	+0.25

“STABLE” AND “UNSTABLE” WORKING FORCE

After the war a question on the length-of-service distribution of active and separated employees was no longer included in labor turnover inquiries, but in the summer of 1928 a special survey was made by the Metropolitan Life Insurance Company with the cooperation of the Bridgeport (Connecticut) Manufacturers' Association, Associated Industries of Massachusetts, Bureau of Business Research of the University of Michigan, New Jersey State Department of Labor, and Wisconsin Industrial Commission.

The results of this survey were briefly summarized in the *Monthly Labor Review*.¹¹ A more detailed breakdown of these figures is presented in Table 4, which classifies the reporting firms according to the participating agencies.

The group of workers with less than 6 months of service constituted 12.6 per cent of the working force in the summer of 1928, while in 1918 it represented 27.1 per cent of all workers and 20.5 per cent in 1914.¹² The declining proportion of new workers does not show that the unstable group, with an abnormally large turnover, had disappeared completely from factories in the summer of 1928, but very likely it was drastically reduced.

If the turnover of the newly hired workers had been exactly the same as that of the rest of the working force, the employee group with less than 1 year of service would be larger than the group with 1-2 years of employment by about the same proportion that the 1-2 year group was larger than the 2-3 year group. In other words, the group of workers with less than 1 year of service would constitute about 19.0 per cent $\left(14.4 \times \frac{14.4}{10.9} \right)$ of the

¹¹ October 1928, pp. 53-54.

¹² The proportion of other length-of-service groups in the summer of 1928 was about the same as in 1914 and differed but slightly from the distribution reported in the summer of 1918 (see Tables 2 and 4) :

Length of service	1914	1918		1928
		<i>In per cent</i>		
6 MONTHS OR MORE.....	100.0	100.0		100.0
6 months to 1 year.....	10.4	17.3		12.4
1 but less than 2 years.....	15.2	20.0		16.5
2 but less than 3 years.....	14.0	12.6		12.5
3 but less than 5 years.....	18.9	12.1		18.1
5 years or more.....	41.4	38.1		40.6

TABLE 4. LENGTH-OF-SERVICE DISTRIBUTION OF EMPLOYEES IN THE SUMMER OF 1928

(In per cent of the working force)

Reporting agency	Less than 6 months	6 but less than 12 months	1 but less than 2 years	2 but less than 3 years	3 but less than 4 years	4 but less than 5 years	5 but less than 10 years	10 years or more
TOTAL (weighted).....	12.6	10.8	14.4	10.9	8.0	7.8	19.9	15.7
New Jersey Dept. of Labor:								
Northern New Jersey....	12.7	10.2	14.0	11.0	8.1	8.3	17.9	17.8
Southern New Jersey....	10.2	9.4	13.5	10.7	10.9	9.3	17.5	18.4
Bureau of Business								
Research, University of Michigan.....	25.4		18.1	12.8	7.4	9.2	18.1	9.0
Wisconsin Industrial Commission.....	16.1	10.7	14.2	10.0	6.9	7.6	18.7	15.8
Bridgeport Manufacturers' Association.....	12.6	11.7	15.7	11.2	6.7	9.4	17.7	15.2
Metropolitan Life Insurance Company.....	11.4	10.1	14.4	10.8	7.9	7.6	21.8	16.2

Source: Data made available to the Committee on Social Security by courtesy of the Metropolitan Life Insurance Company.

working force. But, as 23.4 per cent of all employees were reported in this group, it would seem that the number of new employees was inflated by temporary and seasonal workers and floaters. Obviously, however, this group could not be much larger than the difference between 23.4 and 19.0 per cent, i.e., 4.4 per cent of all workers on payrolls.

The turnover of the floating working force at this time may be estimated on the assumption that the turnover rates in establishments covered by the special length-of-service survey in 1928 were close to the rates currently reported by the Metropolitan Life Insurance Company, as shown in Appendix Table II.

At the date of the survey, 12.6 per cent of the workers on the payrolls of the reporting firms had been hired during the preceding 6 months. On the other hand, the total number of accessions during the same period was equal to 19.0 per cent of the working force. Accordingly, the number of workers who had been hired during this period, but were no longer on the payroll when the survey was taken, was 6.4 per cent (19.0—12.6) of all workers. Since the total number of separations during these 6 months was 17.3 per cent, the number of separated workers with 6 or more months of service must amount to 10.9 per cent (17.3—6.4) of the working force. Hence the turnover rate of this section of

the personnel of the reporting establishments is determined. It amounted to 12.5 per cent ($10.9 \div 0.874$) in 6 months or to 2.1 per cent per month.

As pointed out in the previous chapter, separations in the employee group with less than 6 months of service are of two kinds: (a) separations of potentially stable workers who quit within 6 months, and (b) separations of the floating, temporary and seasonal workers. Assuming that the rate of separations of potentially stable workers with less than 6 months of service was the same as that of workers of longer standing (2.1 per cent per month or 12.5 per cent in 6 months), the number of separations for which this group (representing 8.1 per cent [12.5—4.4] of the working force) was responsible in this period would be 1.0 per cent (0.126×8.1) of the working force. The rest of the separations among newly hired workers is accounted for by the floating group. Thus it is found that a group of employees which constituted 4.4 per cent of the working force was responsible in a period of 6 months for separations of 4.5 per cent ($10.9 - 6.4$) of the working force. This shows that the group had a turnover rate of 102.3 per cent in 6 months, or about 17 per cent per month.

Bearing in mind all the reservations necessary for estimates of this kind, the changes in the composition of the working force from 1914 to 1928 may be summarized as follows:

	1914	1918	1928
Unstable workers, in per cent of the working force.	11-12	11-12	4.2
Monthly separation rate, in per cent of the working force			
All workers	5.3	10.8	2.9
Stable group	1.8	3.4	2.1
Unstable group	33.5	70.0	17.0

The turnover rate of stable workers in 1928 seems to have been approximately the same as in 1914.¹³ But the unstable group was cut to one-third its former size, and its turnover rate, to one-half.

¹³ The great similarity in the distribution by length-of-service classes of workers with more than 6 months of service at the two dates confirms this supposition. Cf. footnote 12.

CHAPTER V
TURNOVER IN A PERIOD OF HEAVY
UNEMPLOYMENT (1930-1940)

LABOR TURNOVER STATISTICS show that during the depression of the 1930's workers very seldom quit their jobs voluntarily; they tended rather to hold on until they were laid off. Voluntary quits became so infrequent that layoff was the principal method employers used for adjusting their working force to business fluctuations. To some extent the increased demand for labor in connection with the defense program has resulted in a return to voluntary quitting, but up to the spring of 1941 the highest monthly quit rate was less than the lowest quit rate in any month before the collapse in the fall of 1929.

LABOR TURNOVER REPORTS OF THE BUREAU OF LABOR
STATISTICS

The official labor turnover statistics of today are based on a very wide sampling which includes practically all important branches of manufacturing. For each industry weighted average rates of turnover are computed; they in turn are weighted according to the working force employed by each industry, and thus average rates for manufacturing as a whole are calculated.¹ This procedure has been applied since January 1931, but the 1930 turnover rates were also recalculated. Thus the new series actually begin with January 1930, a date close to the beginning of the depression.² The lack of continuous statistical series covering a longer period is a serious obstacle to an analysis of recent changes in the structure of the labor market which requires a comparison of labor turnover before and after the economic collapse in the fall of 1929.

¹ *Monthly Labor Review*, April 1931, p. 137.

² Herman B. Byer and John Anker, "A Review of Factory Labor Turn-Over, 1930 to 1936," *Monthly Labor Review*, July 1937, pp. 154 ff.

COMPARABILITY WITH LABOR TURNOVER STATISTICS OF THE
PRECEDING DECADE

The year 1930, the first year of the new series of labor turnover statistics, is the last year of the old series established by the Metropolitan Life Insurance Company. For this year two sets of turnover rates are available, the median rates in the old series and the weighted arithmetic means in the new series, and as Table 5 shows, all rates in the new series are considerably larger than in the old. Since the two sets of figures refer to the same establishments, the disparity between them is due solely to the different methods of computation.

The disparity between the median and arithmetic mean rate indicates a definite correlation between the extent of labor turnover and the size of reporting concerns: in small firms the labor turnover in 1930 was considerably lower than in large firms, which is exactly the opposite of the previous observation that labor turnover tends to decline with the increasing size of establishment.³ There is also a contradiction between the figures in Table 5 and the reports of the censuses of manufactures. The net balance of accessions and separations in the reporting establishments was — 0.8 per cent per month (or — 9.6 per cent for the whole year) according to the median rates, and — 1.9 per cent per month (or — 22.8 per cent during the year) according to the weighted means. This would indicate that the working force of all reporting firms was reduced by more than 20 per cent during 1930, mainly as a result of layoffs in large firms, while the smaller establishments in most cases dismissed less than 10 per cent of their personnel. However, the censuses of manufactures taken in 1929 and 1931 do not report any appreciable difference in the decline in employment in factories of different size.⁴

The contradiction between Table 5 and the censuses of manufactures might have been caused by a disparity in the timing of layoffs in large and small firms. Large companies, especially in the automobile, rubber, and iron and steel industries, might have been the first to adjust their working force to the declining busi-

³ See p. 21. Cf. p. 59.

⁴ See W. S. Woytinsky, *Labor in the United States* (Washington: Committee on Social Security of the Social Science Research Council, 1938), pp. 281-86.

TABLE 5. MEDIAN AND WEIGHTED AVERAGE RATES OF
LABOR TURNOVER IN 1930
(Monthly rates per 100 workers)

Turnover rates	All manu- factur- ing in- dus- tries	Auto- mobiles & bod- ies	Auto- mobile parts and equip- ment	Boots and shoes	Cotton manu- factur- ing	Iron and steel	Saw mills	Slaugh- tering & meat pack- ing
	<i>Old series—Median</i>							
ACCESSIONS.....	1.6	3.1	—	2.3	1.9	1.8	3.0	4.4
SEPARATIONS:								
Total.....	2.4	4.1	—	2.4	1.7	2.1	3.4	3.9
Quits.....	1.1	1.1	—	1.2	1.1	1.1	1.1	1.6
Discharges...	0.2	0.2	—	0.3	0.1	0.1	0.2	0.4
Layoffs.....	1.2	2.7	—	0.9	0.5	0.9	2.0	1.9
	<i>New series—Weighted arithmetic mean</i>							
ACCESSIONS.....	3.1	4.8	6.4	3.5	3.5	2.9	7.5	7.7
SEPARATIONS:								
Total.....	5.0	5.9	9.7	4.8	4.7	3.8	10.1	8.4
Quits.....	1.6	1.4	1.9	1.9	1.8	1.6	3.0	2.2
Discharges...	0.4	0.3	0.6	0.6	0.5	0.3	1.1	0.8
Layoffs.....	3.0	4.1	7.2	2.4	2.4	1.8	6.0	5.4

Sources: *Monthly Labor Review*, February 1931, pp. 105-09; July 1937, pp. 159-75.

ness activity. On the other hand, consumer goods industries, such as food and clothing, in which small firms prevail might have reacted to the depression somewhat later and have reduced their personnel during 1930 and 1931. Such a sequence of layoffs would result in the median rates of labor turnover being lower than the weighted mean rates, but available statistics fail to corroborate the hypothesis that this was actually the cause of the disparity between the two sets of figures.

In any case, the striking disparity between the average labor turnover rates for 1930 ascertained by the two methods is likely to have been a result of the exceptional conditions and is not evidence that under any conditions the two methods would show widely divergent results. More specifically, there is no evidence that the weighted average rates before 1930 would have been appreciably higher than the median rates, or that the median rates after 1930 would have been appreciably lower than the weighted averages. Under the circumstances, the old and new turnover statistics cannot be combined in a continuous series running from 1919 to the present time. However, a rough comparison between them is admissible provided the differences between the two series are explicitly stated.

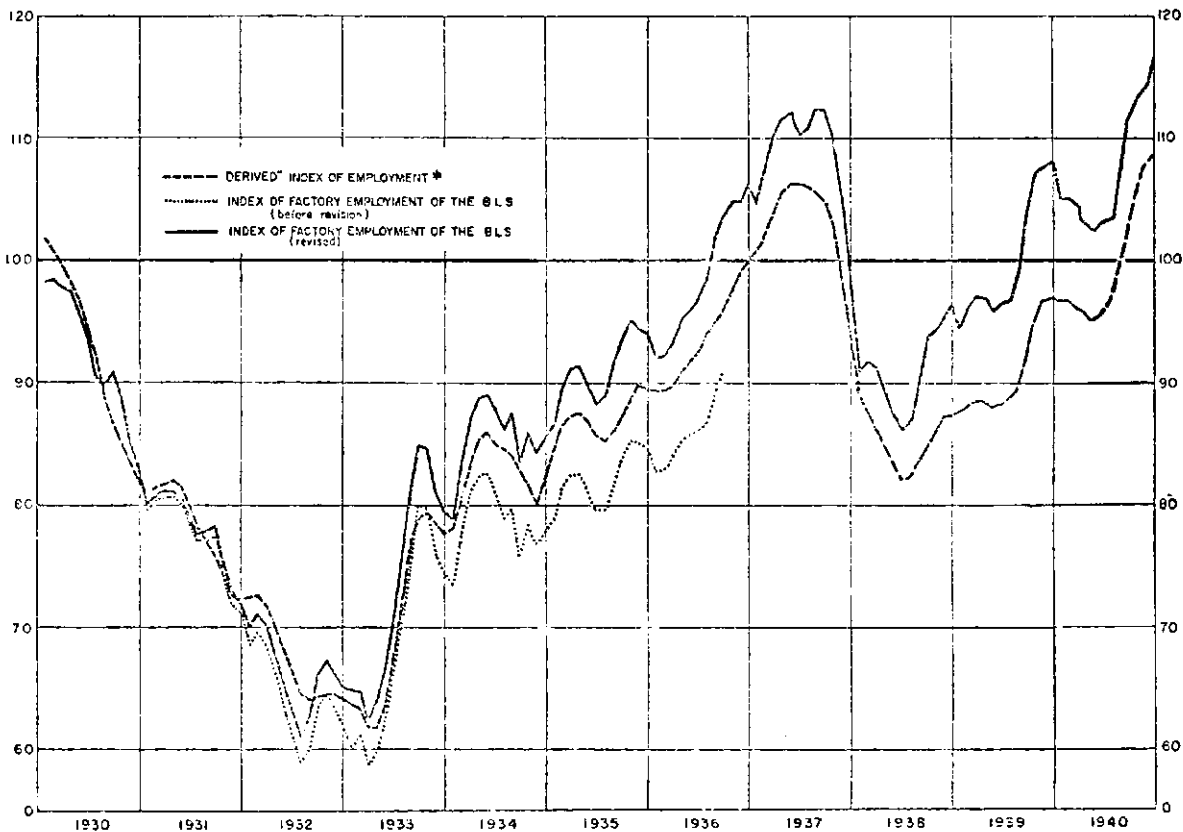
REPRESENTATIVENESS OF THE NEW SERIES

In order to check the representativeness of the new labor turnover series, the net changes in factory employment as indicated by the balance of accession and separation rates (the "derived" employment index explained in Chapter II) should be compared with the employment index of the Bureau of Labor Statistics and the figures supplied by the censuses of manufactures.

The employment index of the Bureau of Labor Statistics, reproduced in Appendix Table III-B, is its revised index, i.e., the index adjusted by the Bureau to the industrial census returns of 1935, 1937 and 1939.⁵ In Diagram VII the "derived" index is compared both with the revised and unrevised employment index, and it is found that, while the index deduced from labor turnover rates deviated considerably upward from the Bureau's unrevised index, up to 1938 it agreed fairly well with the revised index. This seems to indicate that the trend in factory employment from 1930 to 1938 was more correctly reflected in the labor turnover statistics of the Bureau of Labor Statistics than in its direct employment reports. However, the agreement between the derived index and the revised BLS index was restricted to their main movements, while there was a striking difference in their monthly ups and downs, the derived index being smoother than the BLS index of factory

⁵ The Bureau used the returns of the 1935 Census of Manufactures to check the representativeness of the firms currently reporting variations in their employment and payrolls. Although the 1935 Census of Manufactures was not so complete as the decennial census of 1929, it was found that most of the current employment indexes deviated downward. The bias was explained by the fact that "the industrial birth rate far exceeded the death rate during the life span of the Bureau's employment series." (Bureau of Labor Statistics, *Revised Indexes of Factory Employment and Payrolls, 1919 to 1933*, Bulletin No. 610, 1935, p. 11.) It seems, however, that even if the industrial birth rates were not higher than the death rates, a downward bias may develop in an employment index of the usual type because of the uneven recording of the turnover of industrial firms. An employment index based on a carefully selected sample tends as a rule to record the termination of activity of old firms more completely than the entrance of new firms into business. This tendency is inherent in the method and it is extremely difficult to eliminate it by selecting more representative firms. Unless all (or almost all) firms in an industry are currently reporting their employment, each index should be checked periodically with other employment data, and there is a high probability that each successive checking will reveal that a downward bias has developed since the preceding revision. Since the upward revision on the basis of the 1935 Census of Manufactures, the BLS indexes have been twice revised in the same direction.

DIAGRAM VII
 REPRESENTATIVENESS OF LABOR TURNOVER STATISTICS, 1930 TO 1940
 (Employment indexes—Average 1923-1925 = 100)



* Based on the labor turnover statistics of the Bureau of Labor Statistics.

employment.⁶ After the summer of 1938 a considerable disparity developed also between the main movements of the two indexes.

A similar relationship is found between the variations in employment according to the labor turnover statistics and those reported by censuses of manufactures, as shown in Diagram VIII.⁷ Application of the same test to statistics for individual industries and industrial groups, however, does not produce uniform results. In several cases the labor turnover statistics indicate steadier employment in an industry than the industrial employment index. In other cases there was a considerable discrepancy between the derived and the BLS series at the beginning of the observation period but it disappeared later.

EXTENT OF LABOR TURNOVER BY YEARS

The average monthly rates of labor turnover from 1930 to 1940 are shown in Table 6. They are compared with the median rates in 1929 and 1930.

The average accession rate in the 11 years from the beginning of 1930 to the end of 1940 was 4.0 per cent per month, and the average separation rate was exactly the same. This is approximately the level around which the median accession and separation rates fluctuated before the depression. (See Table 3.)

The relationship between the accession and separation rates reflects changing business conditions; there was a surplus of separations from 1930 to 1932, in 1937, and in 1938, and a surplus of accessions from 1933 to 1936 and again in 1939 and

⁶ The comparative smoothness of the derived index may be accounted for by its method of calculation. On the assumption that the same factories are reporting their labor turnover and variation in their employment, and that both reports are completely accurate, they will show the same net changes in employment. But these net changes will be expressed in per cent of average employment during the month in the derived index, and in per cent of persons on payroll in a specified pay period in the Bureau's employment index. The reported rates reflect variations not only in nominators but also in the two series of divisors, and it is likely that the averages used in turnover statistics form a smoother series than the data for individual pay periods on which employment indexes are based.

⁷ In computing the derived employment index for 1929, data of the Metropolitan Life Insurance Company are used. (See Appendix Table II, B-1.) They are tied to the derived index based on the BLS labor turnover series in Appendix Table III, B-1. The two series have been combined in accordance with the change in factory employment from December 15, 1929 to February 15, 1930 as reported by the BLS employment index. The 1933 Census of Manufactures reported the employment of wage earners in March, June, September and December only.

DIAGRAM VIII
FACTORY EMPLOYMENT ACCORDING TO LABOR TURNOVER STATISTICS AND CENSUSES
OF MANUFACTURES FROM 1929 TO 1937

(Average 1929=100)

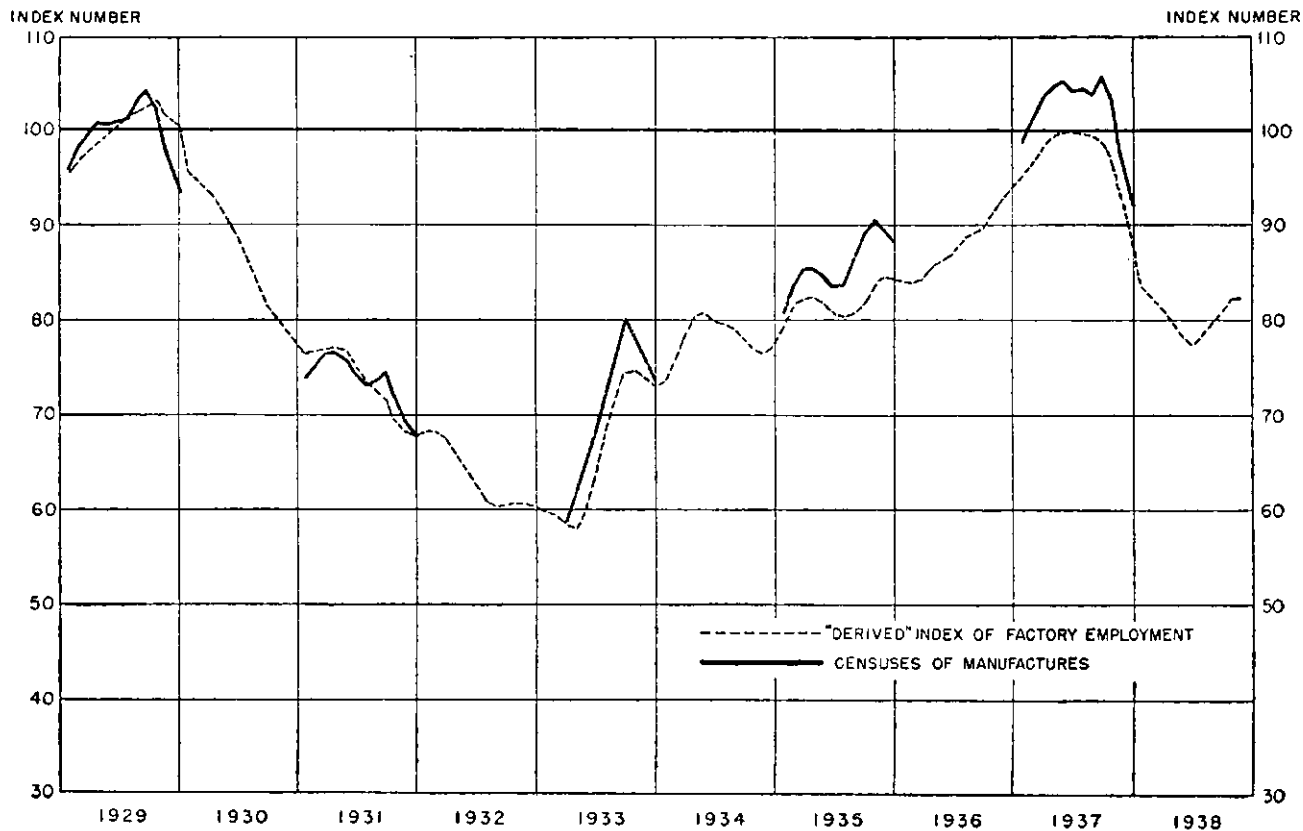


TABLE 6. EXTENT OF LABOR TURNOVER FROM 1930 TO 1940, BY YEARS
(Average monthly rates per 100 workers)

Year	Accessions	Separations			
		Total	Quits ^a	Discharges	Layoffs
<i>Median rates</i>					
1929	4.4	3.8	2.7	0.5	0.6
1930	1.6	2.4	1.1	0.2	1.2
<i>Weighted average rates</i>					
1930	3.1	5.0	1.6	0.4	3.0
1931	3.1	4.1	1.0	0.2	2.9
1932	3.4	4.3	0.7	0.2	3.4
1933	5.4	3.8	0.9	0.2	2.7
1934	4.7	4.1	0.9	0.2	3.0
1935	4.2	3.6	0.9	0.2	2.5
1936	4.3	3.4	1.1	0.2	2.1
1937	3.5	4.4	1.2	0.2	3.0
1938	3.8	4.1	0.6	0.1	3.4
1939	4.1	3.1	0.8	0.1	2.2
1940	4.4	3.35	1.0	0.15	2.2

^a Including miscellaneous separations because of death, retirement on pension, etc., reported separately since January 1940.

Source: *Monthly Labor Review*, 1930 to 1941. For a summary of labor turnover from 1931 to 1939, see *ibid.*, September 1940, pp. 696-704.

1940. (See Diagram IX.) While the correlation between the annual average accession and separation rates and the level of employment is somewhat confused, the correlation between the respective monthly rates is much clearer.

EXTENT OF LABOR TURNOVER BY MONTHS

The main movement of accession and total separation rates from 1930 to 1941 was fairly smooth in comparison with the movement in the 1920's, and there is no positive correlation between the two rate curves on Diagram X.

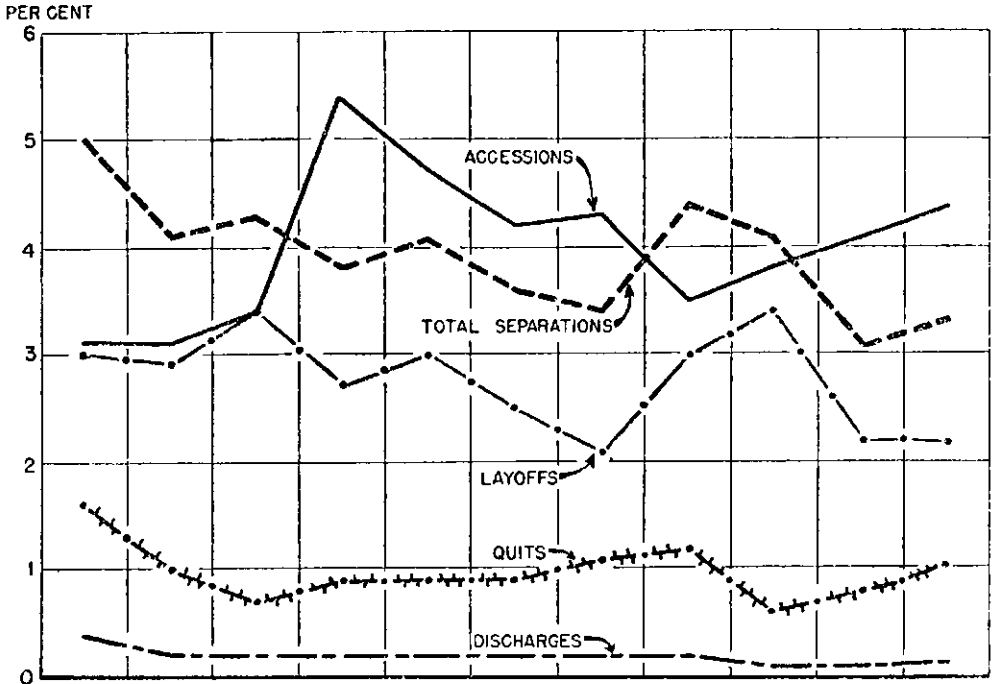
(See Appendix Table III and Diagram X; cf. Appendix Table II and Diagram V.)

In contrast with the preceding decades, the number of separations tended to grow when the number of accessions declined and vice versa. This was true of the short-time variations of the separation and accession rates as well as their main movements, and may be regarded as evidence that in the 1930's the replacement of workers who had quit was of minor importance in comparison with the hiring and layoffs with which the varying demand for labor was met.

DIAGRAM IX

TURNOVER OF LABOR IN MANUFACTURING INDUSTRIES FROM 1930 TO 1940, BY YEARS

(A) AVERAGE MONTHLY TURNOVER RATES



(B) FACTORY EMPLOYMENT (AVERAGE 1923-1925 = 100)

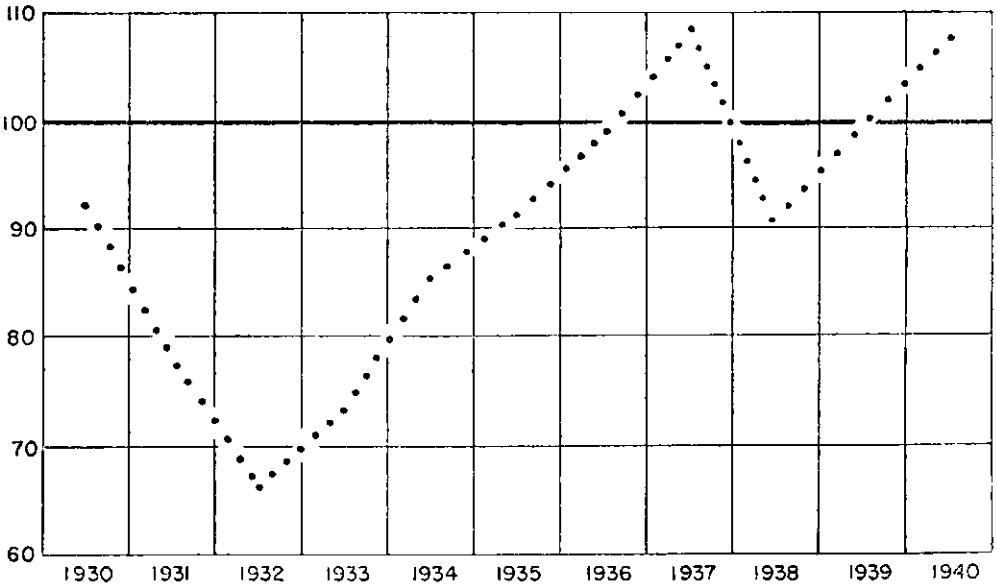
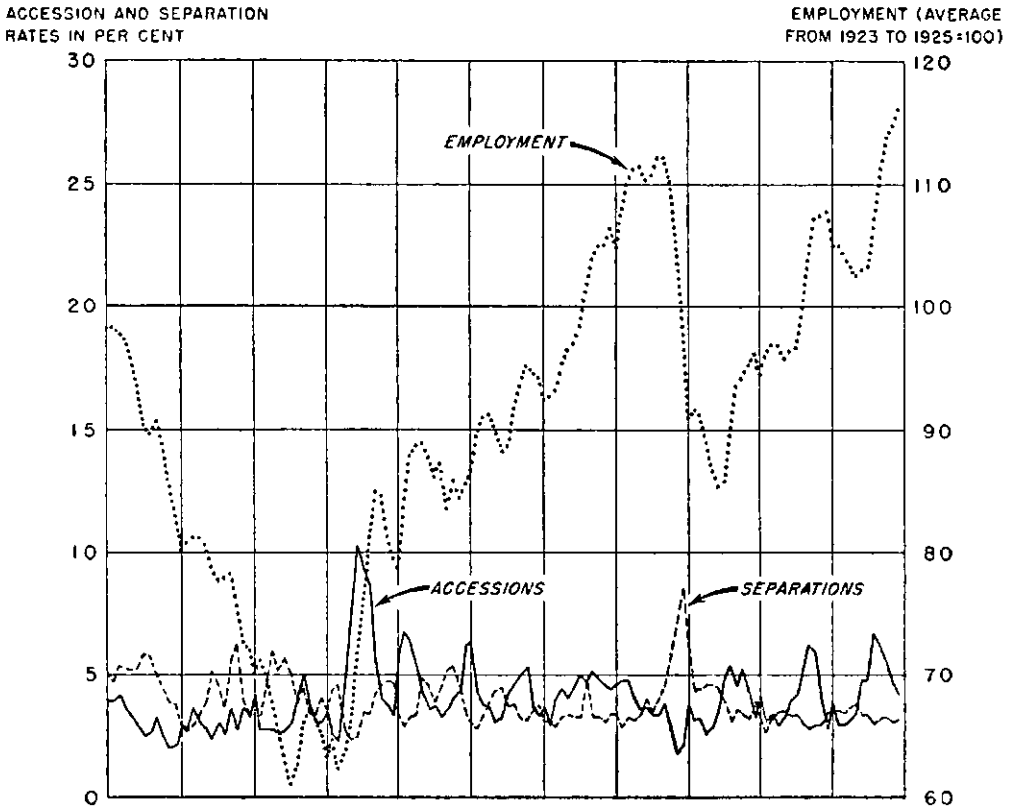


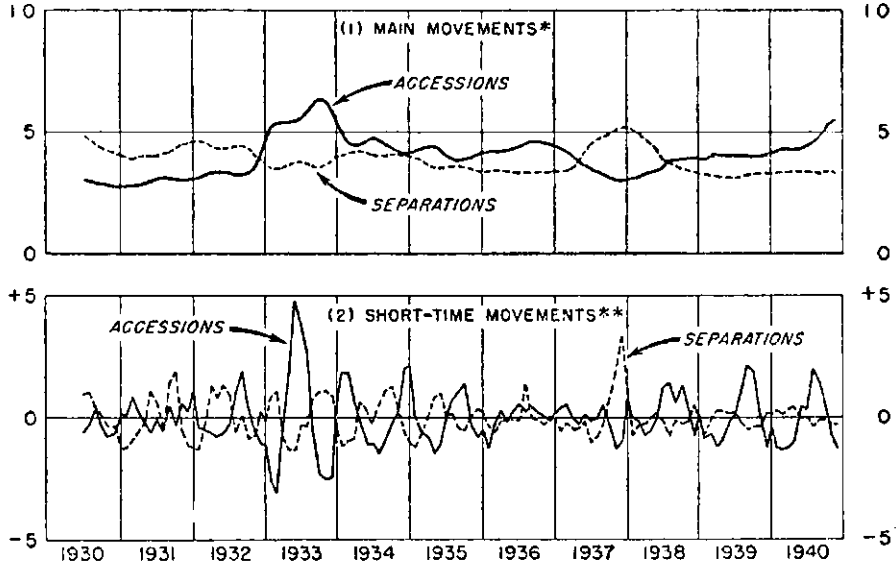
DIAGRAM X

TURNOVER OF LABOR IN MANUFACTURING INDUSTRIES FROM 1930 TO 1940, BY MONTHS

(A) LABOR TURNOVER RATES AND FACTORY EMPLOYMENT



(B) ANALYSIS OF LABOR TURNOVER RATES



* 12-month moving averages of the reported data.

** Deviations from the 12-month moving averages.

DISTRIBUTION OF SEPARATIONS

The outstanding feature of labor turnover up to the end of 1940 was that there were very few voluntary quits and many layoffs. On the average, layoffs constituted 70 per cent of all separations, voluntary quits 25 per cent, and discharges 5 per cent.

The proportion of quits declined gradually during the first phase of the depression. From 36 per cent in the first quarter of 1930 it dropped to 25 per cent in 1931, was between 15 and 20 per cent in 1932, and touched bottom at about 11 per cent in February 1933. In the second phase of the depression, the proportion of quits varied rapidly and irregularly in 1933, and increased steadily from the autumn of 1934 to the spring of 1937. With the beginning of the secondary recession in the fall of the same year, the proportion of quits dropped to less than 10 per cent. It increased again after 1938, particularly since the middle of 1940. It reached 50 per cent in February 1941 and has varied at a level above 60 per cent since March of 1941.⁸

The ratio of quits to total separations constitutes one of the most sensitive indexes of the labor market. It registers not only variations in the demand for labor by industry, but also the changes in the psychological pressure of unemployment on workers.

(See Diagram XI.)

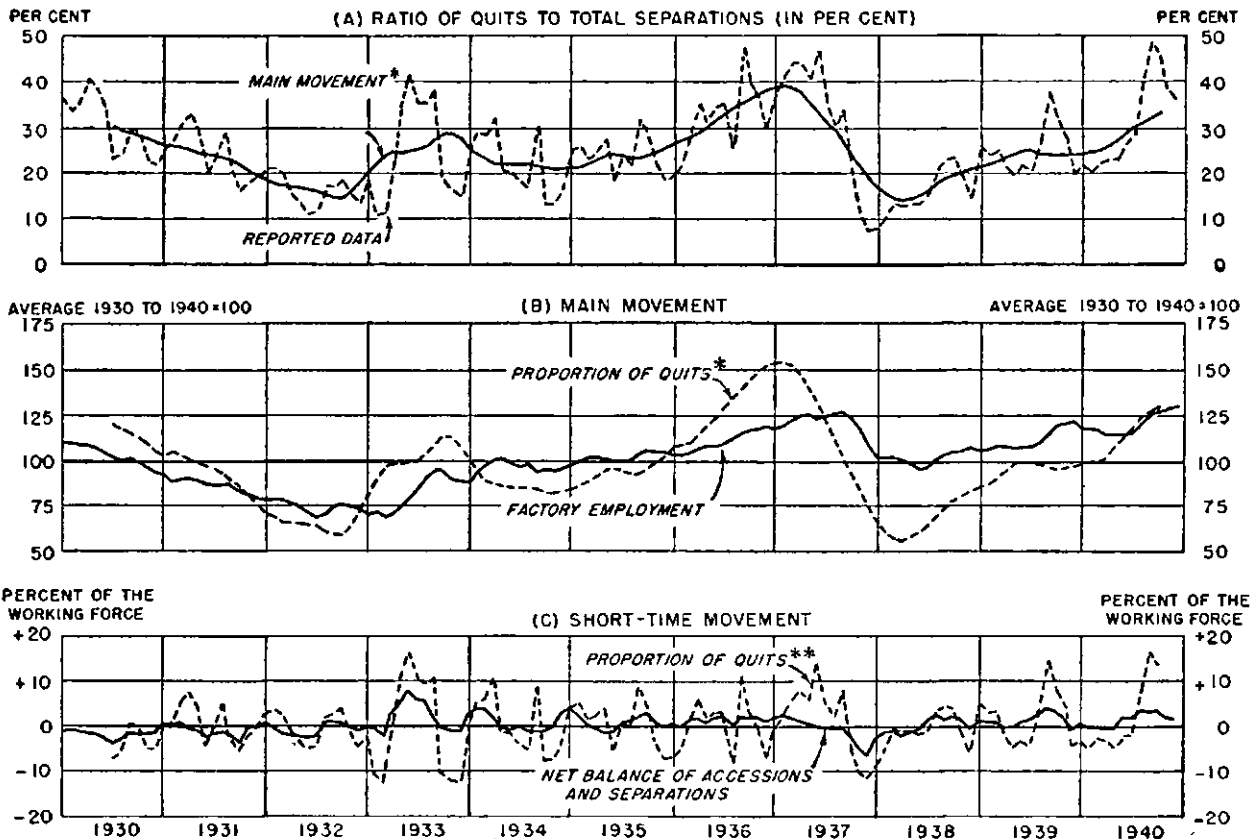
Variations in the proportion of quits reflect the ups and downs in factory employment: a downward trend until the summer of 1932; then a short recovery followed by a decline and a sudden upturn in the spring of 1933; a drop in the fall of the same year, and an upswing thereafter until the summer of 1937. At the end of that year there was a drop, followed by gradual recovery in 1938 to 1940 and especially in 1941.

The main movement of the ratio of quits is overlapped by the sharp short-time variations shown in Chart C of Diagram XI. It will be noticed how closely these variations reflect the changing net balance of accessions and separations. Even on a depressed

⁸ For comparison with data of the 1920's, the term "quits" includes "miscellaneous separations" which the Bureau of Labor Statistics has reported separate from voluntary quits since January 1940. The rate of "miscellaneous separations" (including workers leaving to enter the armed forces) was 0.31 per cent in January 1941, 0.43 per cent in February and March, 0.37 per cent in April, 0.34 per cent in May, 0.36 per cent in June, and 0.30 per cent in July.

DIAGRAM XI

PROPORTION OF QUILTS AMONG SEPARATIONS IN MANUFACTURING INDUSTRIES FROM 1930 TO 1940, BY MONTHS



* 12-month moving averages of the reported data.

** Deviations from the 12-month moving averages.

labor market the proportion of quits increases whenever the increased number of openings offers opportunities of reemployment. On the other hand, the proportion of quits drops, in spite of a comparatively high employment level, whenever new openings become more scarce. Except for these variations, the quit rate from the beginning of the depression up to the second half of 1940 remained at a very low level in comparison with the 1920's.

It should be kept in mind that the quit rate includes, in addition to voluntary quits in the exact sense of this term, miscellaneous separations caused by death, superannuation or sickness, shifts from an employee to an independent status, or withdrawals of married women from the labor market. The number of separations accounted for by death, superannuation and withdrawals from gainful work amounts probably to 3 or 4 per cent of the working force per year, or 0.25 to 0.33 per cent per month. Together with separations caused by sickness, family conditions, etc., the total monthly rate of "miscellaneous" separations may be conservatively estimated at from 0.5 to 0.6 per cent of the working force.⁹ Therefore, the free flow of the manpower in establishments, i.e., the voluntary quit rate in the narrow sense, is roughly measured by the excess of the reported monthly quit rate over 0.5 to 0.6 per cent. This means that there was practically no voluntary turnover of labor in 1932 and only a feeble trace of it in 1931 and from 1933 to 1935.

And yet there is no evidence of an appreciable decline in the extent of the labor turnover in the 1930's in comparison with the 1920's. It appears that the former voluntary flow of the working force was replaced by layoffs. As long as there was a continuous flow of the working force, with an average quit rate of 2 to 3 per cent per month, employment managers could to a certain extent adjust personnel to their requirements by manipulating the number of workers newly hired during each month and,

⁹ It may be smaller in some industries and in some months and larger in others, but this is the probable average level. The rate of miscellaneous separations in the BLS labor turnover statistics for 1940 was very low (with the peak of 0.21 per cent in September). It increased considerably in 1941, and reached 0.43 per cent in February and March. Its further increase may be anticipated with the improvement in classification. It should be kept in mind that this classification is based on reports of employment managers who are not always informed by their employees of the reasons for termination of employment.

if necessary, by postponing the replacement of separated workers. But when voluntary quitting almost ceased to occur, management had recourse to layoffs when manpower had to be reduced.

This change in the distribution of separations by quits and layoffs was of considerable importance for the labor market. Before the depression, workers available for employment were mainly persons who had quit of their own free will, and it is likely that among them were not only the unstable (and marginal) employees but also some of the most efficient workers. In the 1930's, on the contrary, almost all workers whose employment was terminated were laid off, and very probably a selection was made by the management to assure that the most efficient workers were retained. This created a prejudice against the separated workers.

It is obvious that a person out of a job because of layoff has not the same psychological outlook as a worker who has quit of his own accord. The first immediately regards himself as unemployed; the latter is simply midway from one job to another, and if the interval between jobs is not too long, he neither feels unemployed nor expects to be treated as such by society.

With the free flow of labor barred, the working force did not become much more stable than it had been in the 1920's and the number of separations did not decline. But the loss of jobs was more of a hardship for the separated workers and the contrast between employed and unemployed workers became striking.

SEASONAL VARIATIONS

The seasonal ups and downs of the labor market in the period 1930 to 1940 were so overlapped by rapidly changing business conditions that the seasonal rhythm in turnover rates may be measured only roughly.

It seems that the seasonal rhythm of separations in the 1930's was not in sharp contrast to that seen in the preceding decade.¹⁰ There were more separations in summer than in winter, with the seasonal peak in June and the valley in February, the magnitude of variation being about 1.4 per cent of the working force. On

¹⁰ See page 37.

Typical Seasonal Variations in the Extent of Labor Turnover in Factories, 1930 to 1940^a

(Accession and separation rates in each month were larger (+) or smaller (—) than they would have been without seasonal influences, in per cent of the working force.)

Month	Accessions (a)	Separations (s)	Net change (a - s)
January	+0.50	-0.30	+0.80
February	+0.10	-0.90	+1.00
March	-0.10	-0.40	+0.30
April	-0.30	0	-0.30
May	-0.60	+0.30	-0.90
June	-0.50	+0.50	-1.00
July	0	+0.40	-0.40
August	+0.20	+0.30	-0.10
September	+0.70	+0.20	+0.50
October	+0.50	+0.10	+0.40
November	-0.10	-0.05	-0.05
December	-0.40	-0.15	-0.25

^a The indexes of typical seasonal variations in accession and separation rates have been computed by averaging the differences between the reported rates and the 12-month moving averages for the whole period, except for the particularly erratic years 1933 and 1937. The obtained average rates have been slightly smoothed by the freehand method.

(See Diagram XII.)

the contrary, seasonal variations in the number of accessions in the 1930's differed considerably from those of the preceding decades. They had two seasonal peaks in the 1930's (in January and September) and two troughs (in May-June and December).

The net change in employment, as determined by the balance of accessions and separations in the reporting factories, showed a fairly clear seasonal rhythm. There was a surplus of accessions in the first calendar quarter and in September-October, and a surplus of separations from April to July and in December. Thus, there was a seasonal increase in employment from December to March, a decrease from March to August, and a secondary peak in the last quarter of the year. This seasonal rhythm is very similar to that of the factory employment index of the Bureau of Labor Statistics.¹¹

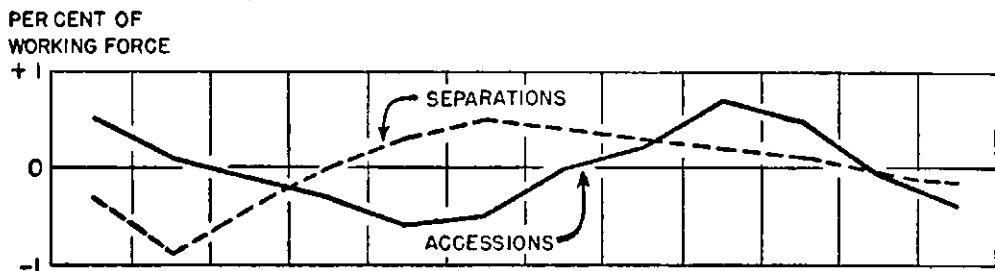
The outstanding feature in the seasonal rhythm of the separation rates from 1930 to 1940 is that the rhythm was determined by the variation in the rate of layoffs rather than in the rate of quits.

¹¹ Cf. Woytinsky, *Seasonal Variations in Employment in the United States*, p. 50.

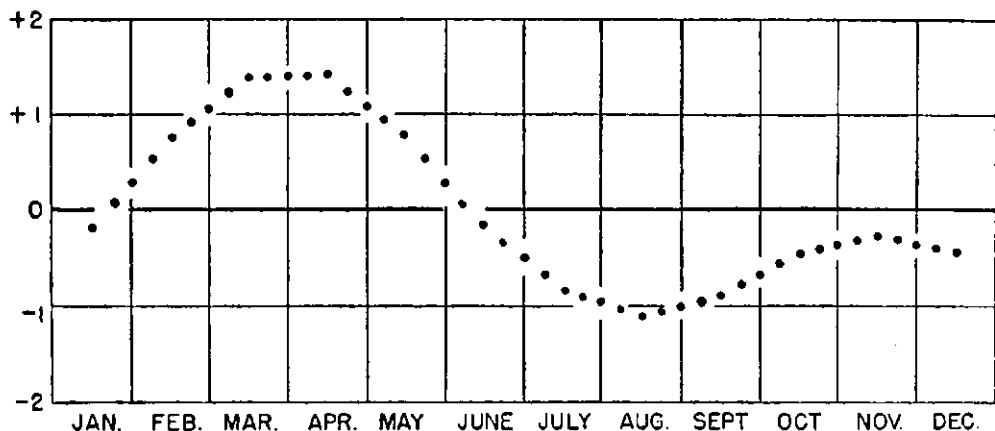
DIAGRAM XII

TYPICAL SEASONAL VARIATIONS IN ACCESSION AND SEPARATION RATES IN MANUFACTURING INDUSTRIES, 1930 TO 1940

(A) DEVIATIONS FROM THE NON-SEASONAL LEVEL



(B) VARIATION IN EMPLOYMENT RESULTING FROM SEASONAL VARIATIONS IN THE NET-BALANCE OF LABOR TURNOVER



Typical Seasonal Variations in the Rates of Quits and Layoffs, 1930 to 1940^a

(Quit and layoff rates in each month were larger (+) or smaller (-) than they would have been without seasonal influences, in per cent of the working force.)

Month	Quits	Layoffs
January	-0.10	-0.30
February	-0.10	-0.60
March	+0.10	-0.40
April	-0.10	-0.20
May	+0.10	0
June	0	+0.60
July	0	+0.40
August	0	+0.20
September	+0.30	+0.15
October	+0.10	+0.05
November	-0.10	-0.10
December	-0.20	+0.20

^a Slightly smoothed by the freehand method.

LABOR TURNOVER BY INDUSTRIES

In addition to labor turnover rates for all factories (in 135 industries), the Bureau of Labor Statistics is now computing separate rates for 39 industries. Data for 28 selected industries are presented in Appendix Table IV, and 16 of them which cover not less than 9 years each are briefly summarized in Table 7.

The largest accession and separation rates are characteristic of industries with strong seasonal variations in the demand for labor—bricks, tile and terra cotta; slaughtering and meat packing; automobiles, parts and equipment; automobiles and bodies; and sawmills.

During the period from 1930 to 1940, there was little change in the ranking of industries by extent of labor turnover. It will be noticed also that the ranking of industries in Table 7 is in alignment with that returned by the early surveys of labor turnover in 1913-14 and 1917-18. At that time there was the same contrast between moderate turnover rates in the clothing and machinery industries and intensive turnover in automobile factories, and slaughtering and meat packing.

TABLE 7. AVERAGE EXTENT OF LABOR TURNOVER FROM
1930 TO 1940 BY INDUSTRIES
(Average monthly rates per 100 workers)

Industry ^a	Year	Accessions	Separations			
			Total	Quits	Discharges	Layoffs
Rubber tires.....	1931-1940	2.41	2.36	0.59	0.08	1.69
Iron and steel.....	1930-1940	2.67	2.53	0.90	0.10	1.53
Petroleum refining.....	1932-1940	2.62	2.47	0.47	0.09	1.91
Hardware.....	1932-1940	2.96	2.71	0.79	0.15	1.76
Electrical machinery.....	1932-1940	3.30	3.01	0.69	0.12	2.20
Boots and shoes.....	1930-1940	3.49	3.54	1.01	0.23	2.29
Cigars and cigarettes.....	1932-1940	3.77	3.69	1.44	0.20	2.04
Foundries and machine shops	1931-1940	3.83	3.51	0.73	0.19	2.59
Men's clothing.....	1932-1940	4.20	4.23	0.84	0.10	3.29
Cotton manufacturing.....	1930-1940	4.45	4.39	1.43	0.30	2.66
Furniture.....	1931-1940	4.94	4.75	0.92	0.25	3.58
Sawmills.....	1930-1940	6.96	7.10	1.72	0.39	4.98
Automobiles and bodies.....	1930-1940	7.36	7.24	1.12	0.23	5.88
Bricks, tile and terra cotta...	1932-1940	7.44	7.33	0.91	0.19	6.23
Automobiles, parts and equipment.....	1930-1940	7.75	7.54	1.21	0.31	6.01
Slaughtering and meat packing.....	1930-1940	7.86	7.71	1.03	0.32	6.36

^a Industries are arrayed by increasing accession rates.

Source: Appendix Table IV.

LABOR TURNOVER BY SIZE OF ESTABLISHMENT

The Bureau of Labor Statistics now computes separate turnover rates for establishments of different sizes in several industries. For this purpose all reporting factories in each of these industries are divided into two groups according to number of workers.¹² Up to the end of 1940 data for 11 industries were made available, and for most of them information is given for several different years. Statistics for each industry in each single year may be considered as a sample measurement of the correlation between the extent of labor turnover and the size of establishment. Forty-four samples are presented in Appendix Table V, each sample showing the rates for accessions and separations, one set for the small, and another for the large establishments.

In almost all industries there was a considerable contrast between the turnover rates in large and small factories. Accession and separation rates increased with the size of establishments in 9 instances and decreased in 35 cases, which is in line with the common observation that there is a negative correlation between the extent of labor turnover and size of establishment. A closer analysis, however, shows that this correlation has little to do with the supposed attachment of employees to large enterprises. If this supposition were valid, there would be a surplus of voluntary quits in small firms, and in fact the opposite is true. In 28 instances the quit rate was higher in the large firms than in the small ones, while the inverse relationship was reported in only 15 cases.¹³ The lower turnover rate in large firms is due entirely to the rate of layoffs, which in 36 instances was lower in large concerns than in small establishments.

The available data seem to indicate that employees of large concerns quit their jobs at least as frequently as employees of small factories, while the tendency toward a lower rate of layoff in large firms is plausibly explained by interdepartmental shifts of workers in these firms. The same factor explains also why the accession rates reported by large firms are not as high as those characteristic of small enterprises.

¹² The borderline between the two groups is chosen according to the character of the industry, varying from 75 employees for furniture factories to 1,000 for the iron and steel industry.

¹³ In one case the rates were equal.

LABOR TURNOVER AND LENGTH OF SERVICE

There are no comprehensive statistics on the distribution of accessions and separations in the 1930's by length of service. The Bureau of Labor Statistics, however, has made available data regarding the length of service of employees who were separated during 1930 from the payrolls of 93 plants in 10 industrial groups. During this year the covered firms had an average of 194,042 employees and reported a total of 102,703 separations, distributed by length of service as follows: ¹⁴

Length of service	Number	Per cent
Under 3 months.....	34,033	33.1
3 but less than 6 months.....	14,519	14.1
6 months but less than 1 year.....	17,492	17.0
1 but less than 2 years.....	15,571	15.2
2 but less than 5 years.....	12,943	12.6
5 years and over.....	8,145	8.0

In comparison with the data for the years 1913-14 and 1917-18,¹⁵ the proportion of newly hired workers among the separations was unexpectedly low and that of employees of long standing surprisingly high. It should be kept in mind, however, that steadily declining employment, with wholesale layoffs, was characteristic of 1930 (of all separations reported by the covered firms, 61,050 were layoffs, 7,624 were discharges, and 34,029 were quits including miscellaneous separations). The composition of separations was naturally determined by these conditions.

It is fairly probable that in the 1930's when the proportion of voluntary quits among all separations was low, the contrast between the stable and unstable employees was no longer so striking as it was 20 years before, but there are no statistical data which might definitely corroborate this supposition.

¹⁴ U. S. Bureau of Labor Statistics, *Handbook of Labor Statistics*, 1936, p. 460.

¹⁵ Cf. Table 2 in Chapter III.

CHAPTER VI

OBJECTIVES AND FINDINGS

PERSONS IN THE GROUP who have been looking for work for 6 months are likely to differ from those who have not been regularly employed for 6 years, and from those who became unemployed only 6 days before an enumeration. People in these three groups cannot be handled identically by employment offices, and each group presents specific problems for unemployment compensation and public assistance agencies. For these reasons, and still more because of the fact that the pressure of idleness on an individual unemployed worker increases as time goes on, proper interpretation of unemployment at a given date requires a classification of the unemployed by duration of idleness. Without this classification, the data on the volume of unemployment alone are not conclusive.

This explains the increasing interest in an analysis of the unemployed in terms of their frequency distribution by period of idleness. Data on this subject provided by censuses, local enumerations, and sample surveys, however, are very inadequate. There are too many marginal cases of partial employment and unemployment, and it is a question of judgment whether the last terminated job was or was not a regular one. Even if it were possible to define in detail all related concepts in instructions to enumerators and interviewers, one could not be sure that these instructions were followed uniformly, and that the terms of the schedule were interpreted alike during depression and prosperity. There might also be appreciable differences in answering the same unemployment schedule in various regions, in communities of different types and size, and in different occupational and socio-economic groups of workers. Some of the unemployed might overstate the duration of their unemployment, while others would understate it.

In these respects the returns of intensive, small-scale sample surveys are more reliable than the data of nation-wide enumera-

tions. Unfortunately, however, when dealing with local surveys one can never be sure of their representativeness. Whether a sample is typical of its universe with respect to unemployment cannot be answered by a comparison of other characteristics of the sample with those of its universe, for even if the sample is representative as to sex, race, age and industrial affiliation, this does not necessarily mean that it is representative as to the pattern of employment and unemployment. The only means of testing the extent to which generalizations can be drawn from sample studies is rather to check them with each other, as a doctor would compare his experience with different individual cases in a clinic. By scrutinizing the returns of unemployment enumerations taken in different localities and under varying business conditions during the last 20 or 25 years, and by examining all unemployment statistics classifying the unemployed by duration of idleness, an attempt may be made to deduce the general patterns.

When each sample is studied as an individual case it is of no particular consequence whether it refers to Buffalo, Columbus, or Philadelphia. The information sought is the main characteristic of the structure of unemployment which appears supposedly in *each* sample. This method is familiar to students of the natural sciences; only by experiment can it be determined whether the same method may be applied to labor market problems.

This explains the selection of data examined in the following chapters. The intention has been to check all more or less suitable sources, rather than to choose those that would answer any specific methodological requirements.

The examination of these data is based on the concept of the "turnover of the unemployed," which is in some respects analogous to that of "labor turnover." At any time the labor force is segregated into two groups: persons with jobs and those without jobs. Part-time workers are classified with the fully employed; new job-seekers (without previous work experience) are counted with the unemployed. The shifting of workers between employment and unemployment is the origin of the turnover of labor in industrial establishments on the one hand, and the turnover of the unemployed on the other. The separation of an individual from his job means his exit from the ranks of the employed, and (unless he

withdraws from the labor force) his entry into the ranks of the unemployed. Likewise, an accession in labor turnover terminology is a cessation of idleness from the viewpoint of turnover of the unemployed. The two concepts are analogous also in their implications. The distribution of the unemployed by duration of idleness is determined by the pattern of turnover of the unemployed, just as the distribution of the working force by length of service is determined by the extent and pattern of the labor turnover. And, similar to the distinction between the stable and unstable groups in the working force is the distinction between the unemployed who have at least a moderate chance of reemployment in the near future and those who have practically no chance unless business conditions improve.

The objective of this part of the study is to cast light on the prevailing patterns of the distribution of the unemployed by duration of idleness, and on the turnover of the unemployed. Particular attention is paid to the distinction between short-time and hard-core unemployment.

The findings briefly summarized in this chapter serve as an illustration of how the turnover of the unemployed has moulded their distribution by duration of idleness. Because of the fragmentary character of the available data, these findings are of course tentative. They serve only to suggest a possible explanation of the observed phenomena, and do not pretend to establish any laws controlling the labor market under varying business conditions.

The methods used in interpreting the data on the distribution of the unemployed by duration of idleness are presented in Chapter VII. This chapter indicates the probable distribution of the unemployed by duration of idleness under conditions of constant rates of labor turnover, and suggests conclusions that might be drawn when the census returns show a deviation from this theoretical distribution pattern.

The selected data on duration of unemployment under different business conditions are examined in Chapters VIII and IX. The former deals with the pre-depression period; the latter with the 1930's.

FINDINGS IN BRIEF

Turnover of the Unemployed and Business Conditions

The labor turnover reports of the Bureau of Labor Statistics provide no evidence of a substantial change in the monthly rates for total separations in manufacturing industries in the 1930's in comparison with the preceding decade, but they show conclusively that there was a shift in the relative prevalence of voluntary and involuntary separations. The decline in the rate of voluntary separations from the 1920's to the 1930's was approximately offset by the increase in the rate of layoffs. Assuming that most of the separated employees became jobseekers, the monthly influx of newly unemployed was approximately the same in prosperity and depression. The total volume of unemployment rose rapidly in the early 1930's, because of the increase in the duration of unemployment rather than in the number of separations; it dropped during the late 1930's, chiefly as a result of the increasing speed of reemployment. This correlation between the duration of unemployment and business conditions appears clearly in variations in the rate of turnover of the unemployed which increases with recovery and decreases with depression. Data on the distribution of the unemployed by duration of idleness provide a basis for estimating the completeness of the enumeration of newly separated workers and for segregating the hard-core group from the turnover group at different phases of the business cycle.

Newly Separated Workers

The unemployment censuses taken before the World War and in the 1920's suggest that many workers who had voluntarily quit shortly before the enumerations did not report themselves as unemployed. On the basis of the local enumerations taken in 1915, it seems likely that if a nation-wide unemployment census had been taken in that year, approximately 1,000,000 newly separated workers would not have reported themselves as unemployed. This group would apparently have been somewhat smaller in the 1920's, and lower still after the collapse in the autumn of 1929. It seems likely that about 150,000 to 200,000 newly separated workers

failed to report as unemployed in the 1930 census. No evidence of this kind of under-enumeration, however, can be discerned in the returns of the special census of unemployment taken in selected urban areas in January 1931, nor in more recent local enumerations.

Generally speaking, in most of the unemployment censuses taken during the depression of the 1930's, newly separated workers seem to have been inclined to report as unemployed immediately after the cessation of employment. Personal observation of employment managers during the early phases of the depression, and later the records of employment offices, indicate that the number of jobseekers was larger than the number of unemployed, because many workers still on payroll but expecting a layoff in the near future began the search for new jobs in advance.

The 1940 census introduced a new procedure in the enumeration of newly separated workers. The census schedule asked whether the worker had *worked for pay or gain during the week* preceding the enumeration, and only those whose answer was "no" were requested to report whether or not they were seeking work. Thus, workers separated less than one week before the enumeration were excluded from the count of the unemployed.

This was an important departure from the procedure of the 1930 census when each person who *usually* worked at a gainful occupation, but did not work on the last regular work day before the visit of the enumerator, was asked whether he had a job, was able to work and was looking for a job. In view of the vagueness of the concept of "usual gainful worker," it is not yet clear whether the comparability of the 1930 and 1940 censuses has been appreciably affected by this change in terminology and procedure. Nevertheless, the under-enumeration of newly separated workers in 1940 could not have been larger than the number of persons separated during the week preceding the enumeration who were still out of work at the end of that week. Since employment in the nation was steadily increasing and the separation rates were comparatively low at the time of the census, it seems unlikely that the number of unreported, newly separated workers was very large. It is estimated at 300,000 to 350,000.

Hard-core Unemployment

In most of the surveys made before the depression, there was a tendency to use the terms "unemployed" and "idle" in a broader sense than they are used now. Old age (superannuation) and sickness, for instance, were tabulated as specific reasons for "idleness," and no distinction was made between persons able and willing to work who were out of jobs because of a lack of work opportunities, and individuals who were "idle" because they had retired from gainful work or were unable to work. In several cases where the "reasons for idleness" were cross-tabulated with the duration of unemployment, it was found that the idleness of persons tabulated as sick or aged tended to last much longer than the average for persons idle because of slack work. If, however, only those persons are counted who are able and willing to work and are "idle because of slack work," it will be found that, in general, continuous unemployment for more than 6 months was fairly unusual before the depression of the 1930's. In striking contrast with the returns of the earlier enumerations, all surveys taken after 1930 revealed among the unemployed a considerable proportion of individuals who had had no regular employment for a number of years.

Another relatively new characteristic of unemployment in the 1930's was an extensive differentiation of the unemployed by duration of idleness, with a sharp contrast in the rates of turnover of the short-time and long-time unemployed. There is no trace of similar differentiation in the unemployment censuses prior to 1930 when long-time idleness due to lack of work opportunities was seldom observed.

Aside from the influence of general business conditions, a separated worker's chance of reemployment depends to a large extent on his personal ability, occupational and industrial affiliation, age, sex, and other personal characteristics. It may vary also from state to state and from city to city. However, the *average* chance that the members of any specified group of the unemployed had for reemployment may be determined in somewhat the same way as the probability of death is computed for specified groups of the population. Computations on this basis seem to indicate that, for unemployed workers of any given statistical description

(by age, sex, occupation, etc.), the chance for reemployment tends to decrease with the duration of idleness. As a rule, the chances are highest in the first weeks after separation. Unless business conditions should markedly improve, the chance the individual has for being rehired during a week or a month diminishes slightly and then levels off for a period of several months, and after that drops rapidly until it becomes negligible.

This statement is based on the analysis of data on duration of unemployment. Most of them suggest the existence of two contrasting groups among the unemployed: persons who have a fair chance of reemployment in the near future, and those who remain out of jobs for considerable periods of time with practically no chance of being hired unless business conditions become decidedly better. The first group may be defined as the "turnover group" of the unemployed; the second is comparatively rigid and constitutes the "hard core" of unemployment.¹

The two concepts are correlated; each can be defined by contrast with the other. It is a question of judgment as to where the borderline between the two groups should be drawn and whether the classification of the unemployed by duration of idleness should be restricted to the segregation of these two groups, or whether they should be further subdivided. It may be argued, for example, that in the turnover group of the unemployed, individuals with a particularly high or particularly low chance of being hired during a specified period should be classified separately; and that in the hard-core group, those with practically no chances be distinguished from those who still have some chance. The point is that, in a depression labor market, one part of the unemployed is practically excluded from the possibility of reemployment, and that its magnitude may be estimated from statistics on the duration of idleness.

To some extent the hard core may result from a gradual negative selection. The more able of the separated workers may find new positions fairly soon, while the others shift, with each month, into the next higher duration-of-unemployment interval. Accidental factors and fortuitous circumstances also have their influ-

¹ The term "hard core" as used here should be clearly distinguished from the concept of "unemployability." The hard-core group does not necessarily consist of submarginal workers; at any one time the term is applied rather to those who have been long unemployed regardless of the reason, and who have little or no chance for reemployment under the then existing conditions.

ence, but as a general rule workers in the highest duration groups have little chance of being reemployed, unless an increasing demand for labor should provide new work opportunities. Thus, the turnover of the unemployed may result in sifting workers very roughly by their efficiency, adaptability, etc., and in segregating the least able workers in the group of the long-time unemployed.

On the other hand, if the supply of labor greatly exceeds demand, even complete equality in the personal qualifications of workers would not prevent the formation of a hard core of unemployment. The distribution of available jobs among competitors without regard to individual qualifications would still leave some workers without jobs longer than others, and their chance of being hired would constantly diminish, partly because of the destructive influence of unemployment, and partly because of the prejudice on the part of employers against men who have been out of work for a long time. Some of the available duration-distribution statistics (especially the Philadelphia surveys) seem to indicate that during a long, severe depression, most of the workers laid off in the early stages of the decline, although probably as able on the average as those subsequently dismissed, are likely to become a part of the hard core.

The formation of a hard core of unemployment was prevented prior to 1930 because periods of abnormally low labor demand were never of very long duration and because the prevalence of voluntary quits as against layoffs improved the employment possibilities for the unemployed. During the 1930's, on the other hand, most separations resulted from a decline in the number of jobs, and the labor market was dominated by continuous unemployment. The hard core of unemployment that developed during that decade has diminished appreciably under the impact of recovery and may become inconspicuous if the demand for labor increases further and the proportion of voluntary quits remains at the comparatively high level prevailing in the summer of 1941.

CHAPTER VII

INTERPRETATION OF THE DISTRIBUTION OF THE UNEMPLOYED BY DURATION OF IDLENESS

IN UNEMPLOYMENT STATISTICS classified by duration of idleness the two extreme duration intervals deserve particular attention. The group of newly separated workers requires analysis because of possible errors in its enumeration, and the group of long-time unemployed merits close examination in connection with the problems of hard-core unemployment.

The number of newly separated workers may be overstated if part-time workers who were not at work on the day of the enumeration are counted as idle, or understated if some of the recently separated workers do not report as unemployed. The hard-core group cannot be identified with any specific duration of idleness interval, as the borderline between this and the turnover group varies with business conditions. The objective of this chapter is to develop a method by which the distribution of the unemployed by duration of idleness, as reported by a census or sample enumeration, may be appraised with a view to determining roughly whether it is accurate in the lowest duration interval and to interpreting the probable meaning of the figures reported in the higher duration intervals.

Assuming that all cases of unemployment are recorded accurately, the number of unemployed workers in each duration of idleness interval is necessarily determined by the number and timing of separations in the period before the enumeration on the one hand, and the number and distribution of accessions on the other. If, for example, an enumeration is taken on April 1, the number of persons unemployed less than one month will equal the number of individuals separated during the preceding March, minus those among them who became employed during the same month; and the number unemployed one but less than two months will equal the number laid off in February, minus those among them who were hired either in February or March. Generally each duration interval of one month includes persons whose last

jobs were terminated in a specified month minus those who have since been reemployed. The number of terminations during the month may vary with business conditions or remain relatively stable. The cumulative number of persons reemployed tends to increase as time goes on, the proportion rehired being larger, as a rule, within two months after separation than within one month, still larger within three months, etc. Therefore, if the number of separations remains steady, or varies only slightly from month to month, the number of persons unemployed one but less than two months is almost certain to be smaller than the number unemployed less than one month, the number with two but less than three months of idleness is likely to be still smaller, etc.

In other words, if the distribution of the unemployed by duration of idleness is represented by a set of horizontal bars, the one at the bottom representing the number of individuals unemployed not more than one month, the next above it those idle from one to under two months, etc., it is likely that the graph will have roughly the shape of a pyramid, similar to a pyramid of population classified by age.

The similarity between the two graphs is accounted for by the similarity in the observed phenomena. In a population pyramid, each bar represents the number of persons born in a specified year (or any other period of time) minus those among them who died before the date of the enumeration. As in the case of separations, the number of births may vary from year to year or remain steady, while the cumulative proportion of those who have died before the enumeration increases from the lowest age interval upward, determining the pyramidal shape of the graph. Separations (the beginning of unemployment) in the unemployment pyramid correspond to the births in the population pyramid; and the rates of hiring in the specified duration-of-idleness intervals are analogous to the mortality rates in the specified age classes. The same reservations are made in both cases for the variations in the separation rate and in the birth rate, and for the instability of the hiring and mortality rates.

A mathematically perfect shape of the duration of unemployment pyramid is no more likely than a perfectly shaped population pyramid, and may be visualized only on the basis of a system of assumptions, as in the following example.

Suppose that in an economic system with 1,000,000 wage earners there were throughout a certain period of time 900,000 persons at work and 100,000 unemployed, the number of separations being constantly counterbalanced by an equal number of accessions. Suppose further that during this time the monthly accession and separation rates remained constant at 5 per cent of the working force. Under these conditions, how would the unemployed workers be distributed by duration of idleness?

Each month 45,000 workers were separated and an equal number of unemployed were hired. The 45,000 vacancies opened by the separations were distributed each month among 145,000 applicants (100,000 unemployed at the end of the preceding month and 45,000 separated during the current month). Assuming that the proportion of persons finding employment during any one month was the same for the 45,000 who were separated during that month and for the 100,000 who had been longer unemployed¹ and assuming further that duration of idleness did not affect chances for reemployment after the first month of unemployment, 31.03 per cent ($45,000 \div 145,000$) of the persons in each duration interval obtained reemployment during any particular month. Therefore, by the end of a month 13,963 of the 45,000 separated during that month would be reemployed. During the following month 31.03 per cent of the remaining 31,037 would be rehired. Thus 21,399 were still unemployed at the end of the first month after the month of their separation; 14,759 at the end of the second month; 10,179 at the end of the third month, etc.

Under the assumptions of a stable volume of unemployment and equal turnover rates, the distribution of the unemployed by duration of idleness would follow the rule of geometric progression, as would the age distribution of the population in a country which had constant and equal birth and death rates with equal mortality in all age classes.

The changing flow of separations and accessions affects the unemployment pyramid in the same way that variations in birth

¹ Since, for workers separated during a particular month, the average duration of idleness up to the end of that month is half a month, this assumption means that persons separated during any one month had twice as good a chance of being hired on any subsequent day of that month as did the unemployed who had lost their jobs earlier. The assumption thus takes into account the fact that persons newly separated often have another job already in view.

and death rates affect the age pyramid. The slopes of the empirical pyramid are not so smooth as in a theoretical example; certain duration groups may be larger, and the others smaller than they should be according to the formula of geometric progression.

If the chances of being rehired are not equal for different groups of workers, there will be a selection among the jobseekers. Those with the best chances will find new positions first, and in each month the percentage of those in the same group who become reemployed will be smaller than in the preceding month. Accordingly, the rate of decrease in consecutive duration-of-unemployment classes may diminish with the growing duration of unemployment, which implies that the slopes of the duration pyramid may be gentle at the bottom and steep at the top.

It is conceivable, for example, that there will be practically no rehiring of men separated for more than (n) months. In this case, there will be about the same number of individuals in the duration intervals from (n) to $(n + 1)$ months, from $(n + 1)$ to $(n + 2)$ months, etc., and this section of the pyramid will rather resemble an obelisk.

The chance an unemployed worker has of being reemployed during a month depends not only on the absolute number of vacancies (accessions) but also on the number of competitors (unemployment at the beginning of the month, plus separations). Therefore, assuming that labor turnover rates remain steady, the slope of the duration pyramid becomes steeper with growing unemployment. During a heavy depression the whole pyramid of unemployment resembles an obelisk, while in prosperous years its slopes are characteristically gentle.

A sharp turn in business conditions leaves traces on the conformation of the duration pyramid in somewhat the same way as the age distribution pyramid of a nation bears traces of great epidemics, wars, and other events which affected birth and death rates in the previous decades. At the beginning of a severe depression, the lower duration classes among the unemployed are particularly large, and the opposite is true early in a recovery.²

² In the actual population pyramid of the United States the lowest age classes (approximately up to 14 years) are conspicuously small because of the low birth rate since the middle 1920's. A similar conformation of the unemployment pyramid might result from a gradual decline in the number of separations.

For the purpose of graphic analysis, the given distribution of the unemployed by duration of idleness may be more conveniently represented by a cumulative ogive with duration of unemployment marked on the horizontal axis, while the vertical ordinate shows the per cent of unemployed workers idle not longer than the time indicated by the horizontal ordinate. The difference between two vertical ordinates indicates the proportion of unemployed who were separated during the specified lapse of time prior to the enumeration.

An extensive analysis of unemployment statistics for different dates and different areas shows that in most cases the duration distribution ogives are fairly smooth in their middle section, approximately for the duration intervals from 2 or 3 months to 1 year. Therefore, within these limits they may be fitted satisfactorily by mathematical curves derived from the formula of geometric progression. On the other hand, these ogives often deviate characteristically from this pattern in the lower or the higher duration intervals, or in both.

MEASURING THE NUMBER OF NEWLY SEPARATED WORKERS

Almost all unemployment statistics for the period before the 1930's show a remarkably small number of newly separated workers, although all workers not at work on the specified day were supposedly counted as unemployed. A similar conformation in the age distribution of the population is characteristic of regions with a heavy immigration of mature persons with a comparatively small number of children. If unemployment censuses report more persons idle from 2 to 4 weeks than for less than 2 weeks, or more persons in the interval of 1 to 2 months than in that of less than 1 month, and if there is no evidence of a change in separation rates at about this time, this suggests the conclusion that some of the newly separated workers were not counted as unemployed.

The probable minimum magnitude of this reported group may be estimated as follows. The number of persons out of jobs 3-4, 4-5, and 5-6 months are compared with each other and the average rate of decline from one group to the next is determined. Then the probable minimum numbers of persons in the duration classes of 0-1, 1-2, and 2-3 months are calculated on the assumption that the respective numbers declined at least at the same rate as those

in the higher duration classes. The difference between the estimated numbers and those returned by the census in the lowest duration groups will indicate roughly the probable minimum number of individuals who were separated from their jobs shortly before the enumeration but did not report as unemployed.

MEASURING THE "HARD CORE" OF UNEMPLOYMENT

If each separated worker had the same chance of finding a job during a month, regardless of the duration of his unemployment, the numbers of persons in the consecutive equal duration intervals would decline by the rule of geometric progression, and there would be slight probability of the same man remaining out of work continuously for a long period.

The distribution of the unemployed by duration of idleness, as reported by censuses and local enumerations, deviates decidedly from this pattern in the upper duration classes. Especially in the enumerations taken during the depression of the 1930's, a considerable excess was reported in the proportion of persons out of work for a comparatively long period of time. This was true with regard to all the unemployed in a specified area as well as to the unemployed classified by industries, occupations, sex or age of workers. The observed distribution of the unemployed indicates that the chances of separated workers for reemployment diminished after the first several months of idleness and later might even have dropped to zero.

Although it is not very clear when and how an unemployed individual ceases to belong to the turnover group and becomes part of the hard-core group, the following procedure may be used as a rough measurement of the probable minimum size of the latter group.

In the given cumulative frequency distribution of the unemployed by duration of idleness, select the middle section which best fits the rule of geometric progression. If necessary smooth the corresponding section of the ogive by the freehand method. Compute for this series the average rate of decline from interval to interval. If A is the first item and R the average ratio of each item to the preceding one, the sum of all items of the declining

series prolonged to infinity as a geometric progression must be $\frac{A}{1-R}$. This would be the aggregate number of workers out of work longer than a specified length of time, if in all duration intervals the chance of reemployment remained steady. The excess of the reported number of persons with more than the specified length of unemployment over $\frac{A}{1-R}$, represents the approximate size of the hard-core group.³

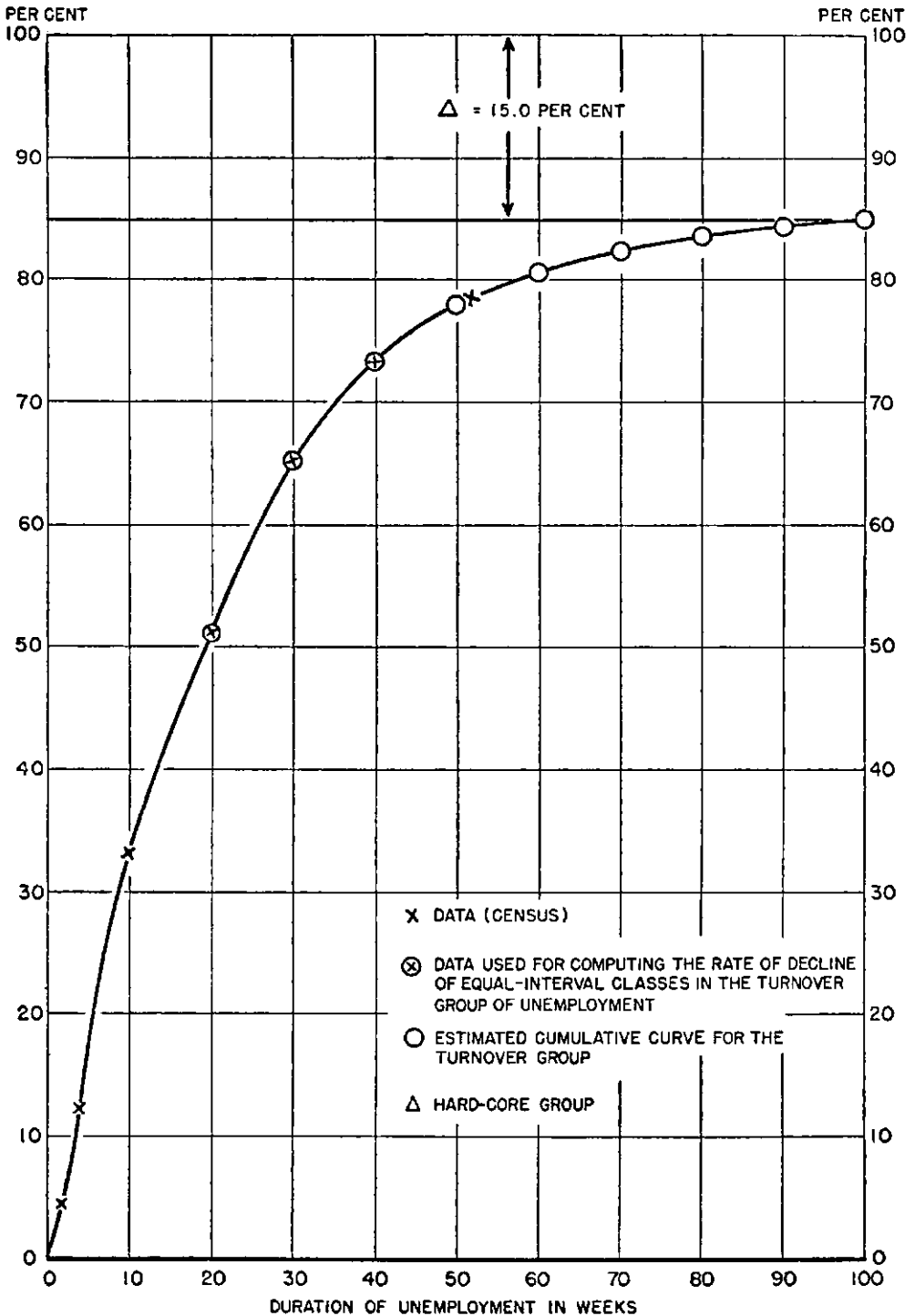
The estimate obtained by this method is conservative. Persons with little or no chance of reemployment, under the given labor market conditions, may be spread over all duration intervals, even among the newly separated workers, and it may be argued that these persons belong to the hard-core group. According to the formula of geometric progression, they are all classified in the turnover group. Furthermore, the method gives an additional chance of reemployment to persons who have been unemployed for several years and whose reemployment in the near future may be rather dubious.

Segregation of the hard-core group within a given distribution of unemployed workers is illustrated by Diagram XIII, which represents the duration distribution of the unemployed in Buffalo, New York, in November 1930. The conformation of the ogive indicates that the number of persons in the consecutive equal duration intervals decreased steadily, amounting to 14.3 per cent in the group unemployed from 20 to 29 weeks and 7.9 per cent in that from 30 to 39 weeks. If the decline had continued at about the same rate, the ogive would have followed the direction of the chain curve in the chart, and the number of persons idle for 20

³ The suggested method is not rigid, but should be adjusted in each instance to the available data. It is a question of judgment as to which intervals should be taken as characteristic for the "normal" monthly decline. It should be kept in mind that the reasoning is based on the assumption of a constant volume of unemployment and equal accession and separation rates for several months before the enumeration. Another method of measuring the hard core of unemployment has been developed by Harry J. Winslow. His method is based on a concept of the turnover of the unemployed as a continuous process, and uses calculus to interpret turnover statistics. In spite of certain technical and theoretical advantages of this method, the simple rule of geometric progression seems to meet the purpose of the present study better. (Harry Winslow, "A Dynamic Analysis of Unemployment Statistics" [Washington: Social Security Board, November 5, 1935], mimeographed.)

DIAGRAM XIII

ESTIMATING THE HARD CORE FROM THE DISTRIBUTION OF THE UNEMPLOYED BY DURATION OF IDLENESS, IN BUFFALO, NEW YORK, NOVEMBER 1930



weeks or more would be the sum of the members of a declining geometric progression, in which the first item (A) is 14.3 per cent and the ratio (R) of each item to the preceding one is 0.57.⁴ This means that, according to the rule of geometric progression, 33.25 per cent $\left(\frac{14.3}{1 - .57}\right)$ of all the reported unemployed would be out of work 20 weeks or longer. The enumeration shows, however, that approximately 48.25 per cent were in this duration interval. The conclusion may be drawn, therefore, that the unemployed in Buffalo at the time of the enumeration might be roughly segregated into two groups. Approximately 15 per cent (48.25—33.25) might be described as the hard-core group with very small chances of being hired under existing conditions, while the rest, about 85 per cent, had fairly good chances for reemployment.

The suggested methods for measuring the probable number of recently separated workers and the hard-core group among the unemployed are applied in the next two chapters to unemployment statistics collected in different parts of the country both before and during the recent depression. Of course, these statistics are not equally reliable and inclusive. Except for the unemployment statistics provided by the 1930 Census of Population and by the special unemployment census taken in January 1931, all are based on sample surveys carried out in individual cities and are not representative of the United States as a whole. They are presented as illustrative examples, and it is left to the reader and to further research to determine to what extent the following observations may be generalized.

⁴ While the ratio $7.9 \div 14.3$ amounts to 0.55, it appears advisable to inflate (R) slightly, so that it will fit better the point of the ogive which shows the proportion of the unemployed with not more than 52 weeks of idleness.

CHAPTER VIII

TURNOVER OF THE UNEMPLOYED BEFORE THE DEPRESSION OF THE 1930's

UNEMPLOYMENT OF CONSIDERABLE SEVERITY has developed time and again in the United States during the last 50 years, but with the one exception of the deep depression in the second half of the 1890's, it was usually of short duration prior to 1930. The three decades from 1900 to 1929 were characterized by intermittent upswings and downswings in the demand for labor; months of widespread unemployment were usually followed by years of prosperity. This rhythm favored a rapid and practically complete turnover of the unemployed and hindered the formation of a hard core.

The prevailing type of unemployment from 1890 to 1926 is illustrated by the unemployment index developed by Paul H. Douglas and L. D. Stinebower. By interpolating the occupational statistics provided by the decennial censuses, they established a series showing the "normal" labor supply for manufacturing, handicraft work, construction and transportation in the middle of each year from 1889 to 1920. Then by extrapolating the fragmentary information available, they computed probable employment in the respective industrial divisions. The excess of the estimated labor supply over employment was supposed to indicate the average volume of unemployment in each year. The results obtained by these authors are shown below:¹

Relative Unemployment Calculated as the Excess of "Normal" Labor Supply
over Employment in Manufacturing and Transportation

(in per cent)

1889.....	5.6	1897.....	14.5	1905.....	0.7	1913.....	5.4
1890.....	5.1	1898.....	13.9	1906.....	-1.4	1914.....	12.9
1891.....	5.6	1899.....	7.7	1907.....	-0.3	1915.....	12.4
1892.....	3.7	1900.....	6.3	1908.....	12.0	1916.....	0.7
1893.....	9.6	1901.....	4.5	1909.....	5.1	1917.....	-3.5
1894.....	16.7	1902.....	-0.1	1910.....	3.7	1918.....	-4.1
1895.....	11.9	1903.....	-0.2	1911.....	5.6	1919.....	0.4
1896.....	15.3	1904.....	7.1	1912.....	4.0	1920.....	1.0

¹ Paul H. Douglas, *Real Wages in the United States, 1890-1926* (Boston: Houghton Mifflin Company, 1930), p. 440.

Thus, in 6 out of the 20 years from 1901 to 1920, the computation showed a negative unemployment. The authors commented on their series as follows: "The immediate conclusion which is likely to be drawn from this apparent paradox is that the result is nonsensical and that the whole series is therefore unreliable. This apparent contradiction is caused by the fact that the estimates of the labor supply which we have thus far made cover merely the *normal* long-time rates of growth or change. During periods of great business prosperity, when the discrepancy appears, there is undoubtedly an abnormal rate of increase in the labor supply for urban industries. This influx comes from two main sources, namely, from the farms and from the reserve labor within working-class families. . . . During the period of the War, when the discrepancy was most marked, many members of working- and middle-class families, who otherwise would have remained at home, entered industry. . . ." ²

Accordingly Douglas and Stinebower revised their labor supply estimate upward for the years in which the original series showed unemployment of less than 3.5 per cent. Combining the revised unemployment rates up to 1920 with the unemployment index developed by Meredith B. Givens and Leo Wolman for 1920 to 1927, they arrived at the following estimate of unemployment in manufacturing and transportation from 1901 to 1927 (in per cent) : ³

1901.....	4.5	1908.....	12.0	1915.....	12.4	1922.....	15.4
1902.....	3.5	1909.....	5.1	1916.....	3.5	1923.....	4.4
1903.....	3.5	1910.....	3.7	1917.....	3.5	1924.....	8.3
1904.....	7.1	1911.....	5.6	1918.....	3.5	1925.....	5.1
1905.....	4.0	1912.....	4.0	1919.....	4.0	1926.....	4.5
1906.....	3.5	1913.....	5.4	1920.....	4.3	1927.....	5.6
1907.....	3.5	1914.....	12.9	1921.....	21.2		

Since these figures are supposed to take into account unemployment due to seasonal factors and the normal turnover of the working force, it is obvious that the turnover of the unemployed was very rapid during the whole period, except in the 1890's. Present knowledge of the mechanism of the labor market points to the probability that hard-core unemployment of considerable size ex-

² *Ibid.*, pp. 440-41.

³ *Ibid.*, p. 445. Unemployment rates for the period from 1889 to 1900 were not revised.

isted between 1895 and 1898, but there are no statistical data to check this supposition.

Two other periods which merit closer examination with regard to the structure of unemployment are the years 1914-15 and the early 1920's. No data are available for 1914, but several local unemployment censuses were made in 1915. For the 1920's only fragmentary data are available, and those collected in Columbus, Ohio, are the most inclusive and best known. These surveys are analyzed in the following pages.

UNEMPLOYMENT IN 1915

During the winter of 1914-15 there was much discussion of the unemployment existing throughout the country, and it was commonly believed that the amount was abnormal.⁴ In order to meet the demand for information on the subject, 30 local censuses of unemployment were taken by the Bureau of Labor Statistics in cooperation with the Metropolitan Life Insurance Company. The statistics provided by these surveys on the distribution of the unemployed by duration of idleness are briefly summarized in Table 8.

It will at once be noticed that the proportion of persons reported as unemployed for 13 days or less was surprisingly small in comparison with the group unemployed from 14 to 30 days. Likewise, the group unemployed 30 days or less was not in most cases as large as might have been expected in view of the proportion unemployed for 31 to 60 days.⁵ Furthermore, the decline between the 31-60 day group and the 61-90 day group probably should have been greater in view of the drop between the 61-90 and the 91-120 day groups. Since the rate of separations for the country as a whole was fairly steady in the second half of 1914 and up to August 1915,⁶ it would seem that not all of the newly separated

⁴ U. S. Bureau of Labor Statistics, *Unemployment in the United States*, Bulletin No. 195, July 1916.

⁵ In New York City in September, the proportions were as might have been expected, 26.5 per cent in the interval of 30 days or less and 16.5 per cent in the 31-60 day interval. In the eastern and middle western cities, however, the proportions were higher in the longer duration interval (14.0 per cent) than in the shorter interval (12.9 per cent). Differences were less noticeable in the February survey in New York City (23.1 per cent in the lower and 20.7 per cent in the higher intervals) and in the western survey (19.9 and 15.1 per cent).

⁶ See Appendix Table I.

TABLE 8. DISTRIBUTION OF THE UNEMPLOYED BY DURATION OF IDLENESS, IN 30 CITIES, 1915

Item	New York City		16 cities in the east, and middle west, ^a March-April	12 cities in Mountain and Pacific Coast states ^b June-July
	February	September		
ENUMERATED WORKERS, TOTAL.....	95,443	97,741	647,394	49,333
UNEMPLOYED:				
Absolute number.....	15,417	6,529	74,218	6,373
In per cent.....	16.2	6.7	11.5	12.9
NUMBER OF UNEMPLOYED FOR WHOM DURATION DISTRIBUTION WAS COMPUTED.....	14,916	6,256	64,880	5,830
<i>Duration of Idleness</i>				
			<i>Percentage distribution</i>	
ALL DURATION CLASSES.....	100.0	100.0	100.0	100.0
1 to 7 days.....	6.6	6.7	2.4	2.9
8 to 13 days.....	4.4	5.5	1.7	0.3
14 to 30 days.....	12.1	14.3	8.8	16.7
31 to 60 days.....	20.7	16.5	14.0	15.1
61 to 90 days.....	16.6	14.1	17.1	13.6
91 to 120 days.....	13.0	9.3	15.4	7.3
121 to 180 days.....	15.4	9.5	20.3	19.6
181 days and over.....	11.1	24.1	20.4	24.4

^a Boston, Mass.; Bridgeport, Conn.; Chicago, Ill.; Cleveland, Ohio; Duluth, Minn.; Kansas City, Mo.; Louisville, Ky.; Milwaukee, Wis.; Minneapolis, Minn.; Philadelphia and Pittsburgh, Pa.; St. Louis, Mo.; St. Paul, Minn.; Springfield, Mo.; Toledo, Ohio; Wilkes Barre, Pa.

^b Butte, Mont.; Los Angeles, Cal.; Oakland, Cal.; Ogden, Utah; Portland, Ore.; Sacramento, Cal.; Salt Lake City, Utah; San Diego, Cal.; San Francisco, Cal.; Seattle, Wash.; Spokane, Wash.; Tacoma, Wash.

Source: U. S. Bureau of Labor Statistics, *Unemployment in the United States*, Bulletin No. 195, July 1916, pp. 6, 57-65, 93, 96, 99, 100.

workers were reported as unemployed in the first weeks of their unemployment.

In the Rocky Mountain and Pacific Coast states, this under-enumeration is apparent, but the sample was too small and the reported figures too irregular for its measurement by means of the method described in Chapter VII. Besides a very considerable under-enumeration of unemployed persons with 1-14 days of idleness, there seems to be some understatement also in the next higher duration group. The total number of persons who had recently lost their jobs and did not report themselves as unemployed may have been as high as 25 or 30 per cent of the number who registered as jobless. The unemployment rate in the 12 surveyed cities would then be increased from the reported 12.9 per cent to about 16 or 17 per cent.

The method described in Chapter VII is more applicable to the statistics for New York City and the 16 eastern and middle

western cities. It is found that, in the 16 cities, the number of newly separated workers who did not report as unemployed probably amounted to about 25 per cent of those who were counted as out of jobs, while in New York the probable proportion was 12 to 15 per cent.

The group of persons with more than 180 days of continuous unemployment was comparatively small in New York in February 1915 (11.1 per cent). It was twice as large in most of the cities canvassed between March and July, and by September amounted to 24.1 per cent in New York. There is no evidence, however, that this group included hard-core unemployment (a term which was not used at that time). Besides, the unemployment surveys of 1915 failed to segregate the jobless persons able and willing to work from those idle because of illness, disability or advanced age, and it is fairly probable that the latter were particularly numerous in the upper duration intervals.

UNEMPLOYMENT IN COLUMBUS, OHIO, 1921-1925

The first of the unemployment surveys in Columbus was taken in 1921, following the suggestion of the President's Conference on Unemployment which met in the autumn of that year.⁷ As the collected data could not be properly interpreted for lack of comparable figures for more prosperous times, it was suggested that the survey be made in several years and this was done by Ohio State University.

The Columbus surveys covered approximately 10 per cent of the working population in the city. Persons reported as idle were classified by "reason for idleness." Only those idle because of "slack work" were unemployed in the sense in which this term is used in more recent surveys, and their distribution by length of unemployment is shown in Table 9.

For the proper interpretation of these figures, the business conditions during the surveyed period should be kept in mind. The post-war depression, which brought the unemployment figures for 1921 to a high point, had started in December 1920 and had practically disappeared by the end of 1922. The timing of the successive phases of the depression was not precisely the same in

⁷ Frederic E. Croxton, *Unemployment in Columbus, Ohio, 1921 to 1925*, U. S. Bureau of Labor Statistics Bulletin No. 409, June 1926.

TABLE 9. DISTRIBUTION OF THE UNEMPLOYED BY DURATION OF IDLENESS, IN COLUMBUS, OHIO, 1921-1925

Item	1921	1922	1923	1924	1925
ENUMERATED WORKERS, TOTAL	11,086	12,121	12,299	10,834	12,151
UNEMPLOYED BECAUSE OF					
SLACK WORK:					
Absolute number.....	1,079	238	282	491	403
In per cent.....	9.7	2.0	2.3	4.5	3.3
<i>Duration of Idleness</i>					
		<i>Percentage distribution</i>			
ALL DURATION CLASSES.....	100.0	100.0	100.0	100.0	100.0
Under 2 weeks.....	7.2	19.7	34.8	12.5	18.3
2 to 3 weeks.....	8.4	20.2	22.7	23.1	26.7
4 to 9 weeks.....	20.8	21.5	25.6	27.5	24.6
10 to 19 weeks.....	14.0	11.2	8.8	17.9	13.5
20 to 29 weeks.....	12.9	6.4	1.8	10.0	7.4
30 to 39 weeks.....	18.6	1.7	—	2.3	1.8
40 to 51 weeks.....	7.4	2.6	1.1	2.1	1.0
52 weeks and over.....	10.8	16.7	5.1	4.6	6.9

Source: Frederic E. Croxton, *Unemployment in Columbus, Ohio, 1921 to 1925*, U. S. Bureau of Labor Statistics, Bulletin No. 409 June 1926.

different parts of the country, but the Columbus survey in October 1921 shows the labor market approximately a year after the beginning of a heavy depression, the 1922 survey reflects a recovering labor market, while the later surveys are characteristic of a period of prosperity.

In all the surveys, except in 1923, fewer persons were reported out of jobs less than 2 weeks than were idle from 2 to 4 weeks. This could not have been accounted for by seasonal influences as the enumerations were all taken in October, the season of extensive labor turnover. A more plausible explanation is that the newly separated workers were underenumerated because some of them failed to report as unemployed.

Taking the 1921 survey as an example, the size of this underenumeration may be estimated as follows. This survey reported a heavy concentration of unemployment in the duration interval of 30-39 weeks. In this group were persons who had lost their jobs in the early phase of the depression, from the second half of December 1920 to February 1921, a period in which there was a large number of layoffs. On the other hand, between February and October 1921, there was no substantial variation in the volume of factory employment in the nation,⁸ and it is fairly probable that,

⁸ See the monthly indexes of employment issued by the U. S. Bureau of Labor Statistics.

apart from the seasonal ups and downs, unemployment in Columbus did not vary much during these months. Under these conditions, the distribution by duration intervals of persons unemployed less than 30 weeks should be in accordance with the rule of geometric progression. A comparison of the number of persons with 10-19 weeks of idleness (14.0 per cent) with that of persons idle 4-9 weeks (20.8 per cent) suggests that workers separated 3 or 4 months before the enumeration had fairly good chances of being reemployed. By means of freehand interpolation of the reported distribution of the unemployed in the 4-29 week intervals, it is found that on the average the number of persons in each successive 4-week interval was approximately 25 per cent less than in the preceding interval of equal length. This suggests that on the average 1 out of each 4 unemployed persons with less than 30 weeks of idleness was hired during a 4-week period.

Assuming that the hiring rates in the two lowest duration classes were identical, it appears that approximately 9.6 per cent of the unemployed should have been idle 2-3 weeks, and 10.6 per cent less than 2 weeks. Thus the two lowest duration classes together should have included 20.2 per cent of the unemployed rather than 15.6 per cent as reported in the survey. This suggests that 20 to 25 per cent of the persons out of jobs less than 4 weeks were not returned as idle.

In the fall of 1922, after unemployment had dropped to a very low level, a few workers laid off the year before still remained out of jobs, while those newly separated found other positions easily. A comparison of the proportion of individuals with less than 2 weeks of unemployment with that of persons out of work 2-3 weeks seems to indicate that the first group was considerably underenumerated. This was also the case in 1924 and 1925.

In the highest duration intervals, the Columbus surveys present no evidence of a considerable amount of hard-core unemployment. Most of the individuals with 52 or more weeks of unemployment in 1921 probably were part of the residual of a group of workers who had been laid off at the beginning of the depression and had found jobs only slowly. They still had a chance for reemployment in the near future, and by definition belonged to the turnover group of the unemployed. Very probably there were some hard-

core cases in 1922, but the total volume of unemployment at that time was so small that this cannot be substantiated. Sufficient evidence is also lacking for the years 1923-25 when the hard core, if it existed in Columbus at that time, could not have exceeded 2 or 3 per cent of the unemployed, or a small fraction of 1 per cent of all workers.

It is possible, of course, that some persons who would have been counted as hard-core unemployed in the 1930's were classified in the Columbus surveys as idle for reasons other than slack work and thus do not appear in Table 9.

CHAPTER IX

TURNOVER OF THE UNEMPLOYED DURING THE DEPRESSION OF THE 1930's

DEVELOPMENTS IN THE LABOR MARKET during the 12-year period from the fall of 1929 to the end of 1941 may be considered as one complete major cycle. Employment had reached a high point in the early autumn of 1929. In the winter following the crash, approximately 2 million workers lost their jobs, and during the next 12 months not less than 1.5 million more were laid off. The number of available jobs continued to decline at this rate until the early spring of 1933. Available statistics indicated that the volume of employment in March 1933 was approximately 12 millions below the mark of September 1929. Since the normal supply of labor had increased by approximately 2 millions during the same period, the total volume of unemployment in March 1933, according to these figures, would have been about 14 millions above the autumn 1929 level without allowing for the forced entry of "additional" workers.

There is no consensus of opinion on the exact number of job-seekers in the labor market prior to the collapse in the fall of 1929. Robert Nathan and the American Federation of Labor concluded there were practically none, while some estimators believed the number ran to several millions, and others assumed there was negative unemployment in terms of the normal labor supply. A total of 14 million unemployed workers, on the other hand, very probably brought a considerable number of "additional" jobseekers into the labor market.¹ Whether they succeeded in their search for work and replaced usual jobholders, or whether they remained in the ranks of the unemployed, it is fairly probable that their presence on the labor market greatly inflated the supply of labor in the early years of the depression. While the exact number of unemployed in the spring of 1933 is not known, estimates have ranged between 14 and somewhat over 16 millions, not including "additional" workers. Their inclusion would increase the unemployment estimates to between 15.5 and 19.0 millions, and the

¹ See Part III of this study.

range would be further widened if the possibility of negative unemployment in September 1929 is taken into account.

After March 1933, the volume of employment grew and, in spite of repeated setbacks, approximately 10 million workers had returned to regular work before the recession in the winter of 1937-38. Reabsorption of the unemployed during this period, however, was slowed down by the normal increase in the labor supply. Since more than 8 million new workers entered the labor market between March 1933 and September 1937 and probably only 6 millions retired from gainful work, primary unemployment would have been reduced only by 8 millions, approximately. It is possible, of course, that some of the additional workers who sought work at the deepest point of the depression had withdrawn from the labor market by the fall of 1937, so that the actual volume of unemployment might have dropped to about 8 millions. During the following winter it increased sharply, and then (apart from short-time fluctuations) declined, but very moderately, until the summer of 1940. Now, after a year and a half of recovery stimulated by armament orders and defense production, employment is considerably above the high mark of September 1929. At the same time the labor supply has been curtailed because of military service.

Although unemployment has not yet been completely reabsorbed, shortages of labor are developing in various industries all over the country. Consequently unemployment problems are viewed quite differently now than they were two or three years ago when many observers were inclined to think that, because of technological progress, a standing unemployment of 8 to 10 millions had become unavoidable. Attention now is focused on maladjustments in the utilization of human resources rather than on the problem of the replacement of labor by technical devices.

From the point of view of unemployment, the depression of the 1930's was the longest and most severe in the history of this country. After $3\frac{1}{2}$ years of continuously shrinking work opportunities, a newly separated worker had only a small chance for reemployment within a short time after discharge. Voluntary quitting, as shown in Part I of this report, had almost completely ceased, and this was accompanied by marked changes in the pattern of the turnover of the unemployed, with an increasing pro-

portion of the jobless concentrated in the highest duration-of-idleness interval. These had practically no chance for regular employment and appeared to be stranded in the hard-core group.

The unemployment statistics examined in this chapter are characteristic of the turnover of the unemployed in various phases of the recent depression, from the early spring of 1930 to the autumn of 1938. While the returns of the 1940 census (not yet available) will no doubt cast more light on related problems, it is not very probable that they will change the general conclusions suggested by the surveys carried out between 1933 and 1938; for definite recovery had only begun when the 1940 census was taken, and business conditions in the last week of March (the week surveyed by the census) were not very different from those prevailing in 1938.

In interpreting the experience of the last decade, it should be kept in mind that the available statistics refer to specific phases of a particular economic cycle. They do not show conclusively that, in comparison with the preceding decades, the structure of the labor market and the pattern of unemployment had undergone fundamental changes which mark a secular trend and permit projection into the future. They reveal rather the pattern of the turnover of the unemployed under specific conditions: lack of work opportunities and restricted labor turnover. If these conditions should return, very probably the phenomena characteristic of the labor market in the 1930's will also return.

UNEMPLOYMENT IN THE UNITED STATES ON APRIL 1, 1930

The 1930 census provided for the first time in the history of the United States an inclusive enumeration of the unemployed at a specific date. On the "Unemployment Schedule" used in connection with the population schedule, an entry was made for every gainful worker who was not at work on the day preceding the visit of the enumerator (or on the last previous work day in case that day was not a regular working day).² Gainful workers listed as not at work were asked whether they had "a job of any kind," and those who answered affirmatively were asked why they had not been at work yesterday and whether they had lost the day's

² Instructions to Enumerators, par. 243.

pay. Persons registered as not at work and having no job were asked whether they were able to work and were looking for a job. In this way seven classes of unemployed were determined, but only two of them were tabulated in the census report: ³

	Total	Male	Female
Class A—Persons out of jobs, able to work, and looking for jobs.....	2,429,062	2,058,738	370,324
Class B—Persons having jobs but on layoff without pay, excluding those sick or voluntarily idle	758,585	627,407	131,178

In the census report it was recognized that Class B included many persons who were working on a part-time basis,⁴ but there is no evidence that all of them were so classified. Indeed, a part-time worker was counted as Class B unemployed if he regarded the day on which he was laid off as a "regular working day" and reported that he lost a day's pay. On the other hand, one who did not consider the specified day as a "regular working day" would not be counted as unemployed.

Except for the 75,197 persons explicitly returned by the census as part-time workers, probably most of the rest of the Class B unemployed were actually no better off so far as jobs were concerned than those tabulated in Class A. The distribution of Classes A and B by duration of idleness reveals a close correlation between a worker's interpretation of his status and duration of unemployment. Conscientious belief in the employment manager's statement that he was only temporarily laid off would lead the worker to report himself in Class B. On the other hand, workers whose period of layoff had lasted a few weeks without a recall to work apparently realized they were without jobs and reported as Class A unemployed. For the purpose of the analysis in this section, therefore, both Class A and Class B, except workers specifically reported as part-timers, are regarded as unemployed. Their distribution by duration of idleness is shown in Table 10.

If these distributions are represented by cumulative ogives, it is seen that the decline in the number of persons in the lowest consecutive 1-week intervals is too slow compared with the drop between the groups with 3 or 4 and 5 or 6 weeks of idleness, or with the decline between the intervals of 5 or 6 and 7 or 8 weeks. This means that some of the recently separated workers were not

³ Fifteenth Census of the United States: 1930, Unemployment, vol. II, p. 2.

⁴ *Ibid.*

TABLE 10. DISTRIBUTION OF THE UNEMPLOYED BY DURATION OF IDLENESS, IN THE UNITED STATES ON APRIL 1, 1930

Duration of unemployment ^a	Unemployed (Classes A and B combined)			Having no jobs (Class A)			Having jobs (Class B) ^b		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
	<i>Number in thousands</i>								
ALL DURATION CLASSES	3,112	2,627	485	2,429	2,059	370	683	568	115
	<i>Percentage distribution</i>								
ALL DURATION CLASSES ^c	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Under 1 week	8.4	8.1	10.0	2.6	2.5	3.3	29.8	29.3	32.1
1 or 2 weeks	15.0	14.4	18.4	13.1	12.5	16.3	22.2	21.5	25.7
3 or 4 weeks	13.3	12.8	15.9	13.4	12.8	16.5	13.0	12.8	13.8
5 to 8 weeks	14.4	14.3	15.0	15.3	15.1	16.8	11.1	11.5	9.2
9 to 13 weeks	13.7	13.8	13.3	15.2	15.2	15.2	8.3	8.5	7.3
14 to 26 weeks	23.4	24.6	16.9	26.4	27.7	19.3	12.5	13.2	9.2
27 to 52 weeks	} 11.6	} 11.9	} 10.4	10.6	10.8	9.6	} 2.9	} 3.0	} 2.8
53 weeks and over				3.4	3.4	3.0			

^a "1 or 2 weeks" in this table means "1 but less than 3 weeks," "3 or 4 weeks" means "3 but less than 5 weeks," and so on. Therefore, the lowest duration group in this classification contains a little less than one 1-week interval, while the two next higher groups contain two 1-week intervals each, the fourth includes four such intervals, etc.

^b Excluding part-time workers and those sick or voluntarily idle.

^c Excluding persons for whom the period of idleness is not reported.

Source: Fifteenth Census of the United States: 1930, Unemployment, Vol. II, pp. 317-19. All percentages have been recomputed.

enumerated. Examination of the ogives suggests that the extent of the under-enumeration may be conservatively estimated at from 4 to 5 per cent of Classes A and B.

The surprisingly small proportion of persons out of work 53 weeks and over in Table 10 may be accounted for by the fact that the peak in the demand for labor which preceded the economic collapse fell in the third quarter of the year 1929. Marginal workers, who as a rule were more often unemployed than at work but had found jobs in that period, would report 14 to 26 weeks of idleness at the census of April 1, 1930.

UNEMPLOYMENT IN SELECTED URBAN AREAS IN JANUARY 1931

In January 1931 a special census of unemployment was taken in 21 selected urban areas, of which 18 were entire cities and 3 were boroughs of the City of New York. The methods of enumeration and classification were essentially the same as in the 1930 census. The results of the enumeration may be summarized as follows: ⁵

Unemployed	Special Census, January 1931			Census, April 1930 (the same areas)		
	Total	Male	Female	Total	Male	Female
A. Having no jobs	1,930,437	1,511,829	418,608	775,560	647,254	128,306
B. Having jobs	367,814	307,139	60,675	138,562	113,818	24,744

⁵ *Ibid.*, p. 366.

As in 1930, the Class B unemployed included: (1) part-time workers who were not at work on the day before the call of the enumerator, and (2) persons laid off for an indefinite period. Since the census of January 1931 did not specify part-time work as one of the reasons for idleness, it is not known how many part-time workers were counted as unemployed. However, the distribution of the unemployed by length of idleness indicates that those with less than 1 week of idleness were understated in Class A and overstated in Class B. The following numbers of unemployed were reported in January 1931:⁶

Duration of unemployment	Class A Having no jobs			Class B Having jobs		
	Total	Male	Female	Total	Male	Female
Under 1 week.....	6,480	4,601	1,879	246,126	205,512	40,614
1 or 2 weeks.....	88,141	63,120	25,021	35,990	29,702	6,288
3 or 4 weeks.....	156,110	109,137	46,973	19,562	15,942	3,620
5 to 8 weeks.....	255,258	189,849	65,409	17,357	14,299	3,058

As the census was taken at a time of rapidly declining employment, when labor turnover statistics showed an unusually low accession rate,⁷ separated workers had a comparatively small chance of being hired. Yet the ogive of the distribution of Class A unemployed by duration shows that the numbers of persons in equal duration intervals (e.g., 3 or 4, 5 or 6, 7 or 8 weeks) declined gradually at a rate of about 3 per cent per week (or 6 per cent in a 2-week period). Accordingly, the number of persons idle less than 1 week, in each sex and each class, should have been somewhat more than half of the respective numbers idle 1 or 2 weeks. On the assumption that the numbers in the second interval were reported correctly, there should have been approximately 31,900 men and 13,000 women idle less than 1 week in Class A, and 15,600 men and 3,700 women in the same interval in Class B. The figures reported for this duration interval in Class A are obviously understated, while they are much too high in Class B. Comparison of the two sets of figures suggests that about 38,400 Class A unemployed with less than 1 week of idleness (27,300 men and 11,100 women) were returned in Class B. After making this correction the figures for Class B still seem to be overstated by approximately 188,400 (162,600 men and 25,800 women). It is not unlikely that this was due mainly to the report-

⁶ *Ibid.*, pp. 596-99.

⁷ See Appendix Table III.

ing of part-time workers as Class B unemployed. In Table 11 the distribution of the unemployed with less than 1 week of idleness has been adjusted in accordance with these calculations.

There is no evidence that there were many recently separated workers in the surveyed urban areas in 1931 who were not returned either in Class A or Class B.

A comparison of Tables 10 and 11 shows considerable differences in the distribution of the unemployed in April 1930 and January 1931, the increase in the proportions of long-term unemployed being especially striking. In the 1930 census only 11.6 per cent of the unemployed were reported as idle more than 26 weeks, while the January 1931 census reported 30.2 per cent in this interval. More specifically, by 1931 the proportion of Class A unemployed with more than 1 year of idleness had increased from 3.4 to 8.0 per cent for men and from 3.0 to 5.0 per cent for women. A comparison of the totals reported by the two censuses for the same areas is, however, more instructive.

On April 1, 1930, in the 21 selected urban areas, the following numbers of workers with the specified duration of unemployment were found (Classes A and B combined, in thousands) :⁸

Duration of unemployment	Total	Male	Female
All duration classes.....	958	792	166
Under 1 week ⁹	86	64	22
1 or 2 weeks.....	105	81	24
3 or 4 weeks.....	112	88	24
5 to 8 weeks.....	137	111	26
9 to 13 weeks.....	135	113	22
14 to 26 weeks.....	230	203	27
27 to 39 weeks.....	56	50	6
40 to 52 weeks.....	47	40	7
53 to 104 weeks.....	21	18	3
105 weeks and over.....	9	8	1
Not reported.....	20	16	4

Since there was an interval of 9 months between the two enumerations, all persons who were returned as unemployed in April 1930 and had not been hired since would have reported 40 weeks or more of unemployment by January 1931. Similarly, those reporting 14 weeks or more of unemployment by the first date should have appeared in the group unemployed 53 weeks or more by

⁸ Computed from the Fifteenth Census of the United States: 1930, Unemployment, vol. I.

⁹ Augmented by 5 per cent of the returned number of Class A unemployed. See page 90.

TABLE 11. DISTRIBUTION OF THE UNEMPLOYED BY DURATION OF IDLENESS, IN SELECTED URBAN AREAS, JANUARY 1931

Duration of unemployment	Unemployed (Classes A and B combined)			Having no jobs (Class A)			Having jobs (Class B) ^a		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
ALL DURATION CLASSES ^b	2,109.8	1,656.3	453.5	1,968.8	1,539.1	429.7	141.0	117.2	23.8
	<i>Number in thousands</i>								
ALL DURATION CLASSES ^b	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	<i>Percentage distribution</i>								
Under 1 week.....	3.1	2.9	3.7	2.3	2.1	3.0	14.9	14.6	16.7
1 or 2 weeks.....	5.9	5.7	7.0	4.5	4.1	5.9	28.1	27.9	29.2
3 or 4 weeks.....	8.4	7.6	11.3	8.0	7.1	11.0	15.2	15.0	16.7
5 to 8 weeks.....	13.1	12.5	15.3	13.0	12.4	15.3	13.6	13.5	14.4
9 to 13 weeks.....	14.0	14.0	13.9	14.3	14.3	14.2	10.1	10.3	8.8
14 to 26 weeks.....	25.2	25.7	23.6	26.1	26.6	24.4	10.9	11.4	8.8
27 to 39 weeks.....	10.3	10.8	8.6	10.8	11.3	9.0	2.5	2.6	1.9
40 to 52 weeks.....	12.9	13.2	11.8	13.6	13.9	12.3	3.0	3.1	2.3
53 to 104 weeks.....	6.0	6.5	4.1	6.3	6.9	4.2	1.1	1.1	0.9
105 weeks or over.....	1.0	1.1	0.8	1.1	1.1	0.8	0.5	0.5	0.5

^a Excluding part-time workers and those sick or voluntarily idle.

^b Corrected as explained on page 91.

Source: Computed from the Fifteenth Census of the United States: 1930, Unemployment, Vol. II, pp. 596-99.

January 1931. Thus the proportion of persons who remained unemployed throughout the period between the two censuses can be calculated. Assuming the reliability of both enumerations, this proportion was about 54 per cent (for both classes of unemployed and both sexes), and the average chance of being hired was more than 7 per cent per month for persons reported as unemployed at the 1930 census. As the volume of unemployment was continuously increasing in the 9 months between the two censuses, the chance of reemployment was probably higher than 7 per cent in the early months and less than that in the later months.

In general, the distribution of the unemployed by length of idleness in the selected areas in 1931 was very smooth and in alignment with the assumption that separated workers were gradually reabsorbed at a more or less steady monthly rate.¹⁰ As Table 11 shows, the proportion of persons with more than 52 weeks of continuous unemployment was very small, suggesting that hard-core unemployment had not yet reached appreciable dimensions.

¹⁰ The only appreciable irregularity appeared in the interval of 40 to 52 weeks of idleness, where the number of persons was somewhat larger than expected in comparison with the preceding duration class. This might have the same origin as the often remarked unevenness in the frequency distribution of the population by age, where there is an overstatement in the age classes corresponding to the "round" numbers of years (20, 30, 40, etc.).

UNEMPLOYMENT IN BUFFALO, NEW YORK, 1929 TO 1933

Surveys carried out in Buffalo by the Buffalo Foundation, in cooperation with the State Department of Labor, the University of Buffalo, and the State Teachers' College at Buffalo, deserve attention as a sample indicating changes in the extent and composition of unemployment in an early phase of the depression.

Enumerations were taken annually from 1929 to 1933 at the same date (November) and in the same areas, so that the results of the five surveys are fairly comparable.¹¹ The schedule used in 1929 contained an inquiry on the reason for idleness, but did not ask whether the persons reported as idle were able to work and willing to work—two questions which were asked from 1930 on. Later, when the 1929 figures were compared with the more recent data, only persons idle because of slack work were classified as unemployed in the narrower sense of this term.

The following percentages of unemployed among usually employed persons able and willing to work were found:

	Male	Female
November 1929.....	6.2	3.5
November 1930.....	17.2	14.6
November 1931.....	24.3	21.1
November 1932.....	32.6	25.4
November 1933.....	28.7	26.1

The duration distribution was computed separately for unemployed men and women in 1929, 1930, and 1931, and for men only in 1932 and 1933. The available statistics for men are briefly summarized in Table 12 and are represented graphically by cumulative curves on Diagram XIV.

All five ogives on Diagram XIV are remarkably smooth and indicate that turnover of the unemployed continued throughout the period covered. There was no evidence of an understatement in the number of newly separated workers, and the proportion of unemployed in consecutive equal duration intervals declined steadily. For example, in all five surveys, the number of men out of jobs 30-39 weeks was from 50 to 55 per cent of the number of

¹¹ New York Department of Labor, "Unemployment in Buffalo," November 1929 (Special Bulletin No. 163), November 1930 (Special Bulletin No. 167), November 1931 (Special Bulletin No. 172); *Monthly Labor Review*, March 1934, pp. 524-26.

TABLE 12. DISTRIBUTION OF UNEMPLOYED MEN BY DURATION OF IDLENESS, IN BUFFALO, NEW YORK, 1929 TO 1933

Duration of unemployment	1929	1930	1931	1932	1933
ALL CLASSES.....	100.0	100.0	100.0	100.0	100.0
Under 2 weeks.....	15.8	4.3	2.6	1.4	2.7
2 to 3 weeks.....	22.2	7.9	5.0	2.7	5.2
4 to 9 weeks.....	30.4	21.0	12.7	6.3	10.1
10 to 19 weeks.....	12.3	17.9	13.4	7.8	5.7
20 to 29 weeks.....	6.2	14.3	11.7	10.7	4.4
30 to 39 weeks.....	3.1	7.9	6.4	5.9	2.3
40 to 51 weeks.....	0.7	5.6	5.2	5.1	1.4
52 weeks and over....	9.3	21.1	43.0	60.1	68.2

Source: *Monthly Labor Review*, March 1934, p. 526.

persons unemployed 20-29 weeks, which means a hiring chance of about 20 per cent per month. However, this chance declined rapidly in the higher duration intervals.

Analysis of the reported data according to the method developed in Chapter VII suggests that hard-core unemployment grew as the depression continued. Its extent may be estimated as follows:

	In per cent of the unemployed	In per cent of all male workers
November 1929.....	7.0	0.5
November 1930.....	17.0	2.0
November 1931.....	40.0	10.0
November 1932.....	60.0	20.0
November 1933.....	20.0	6.0

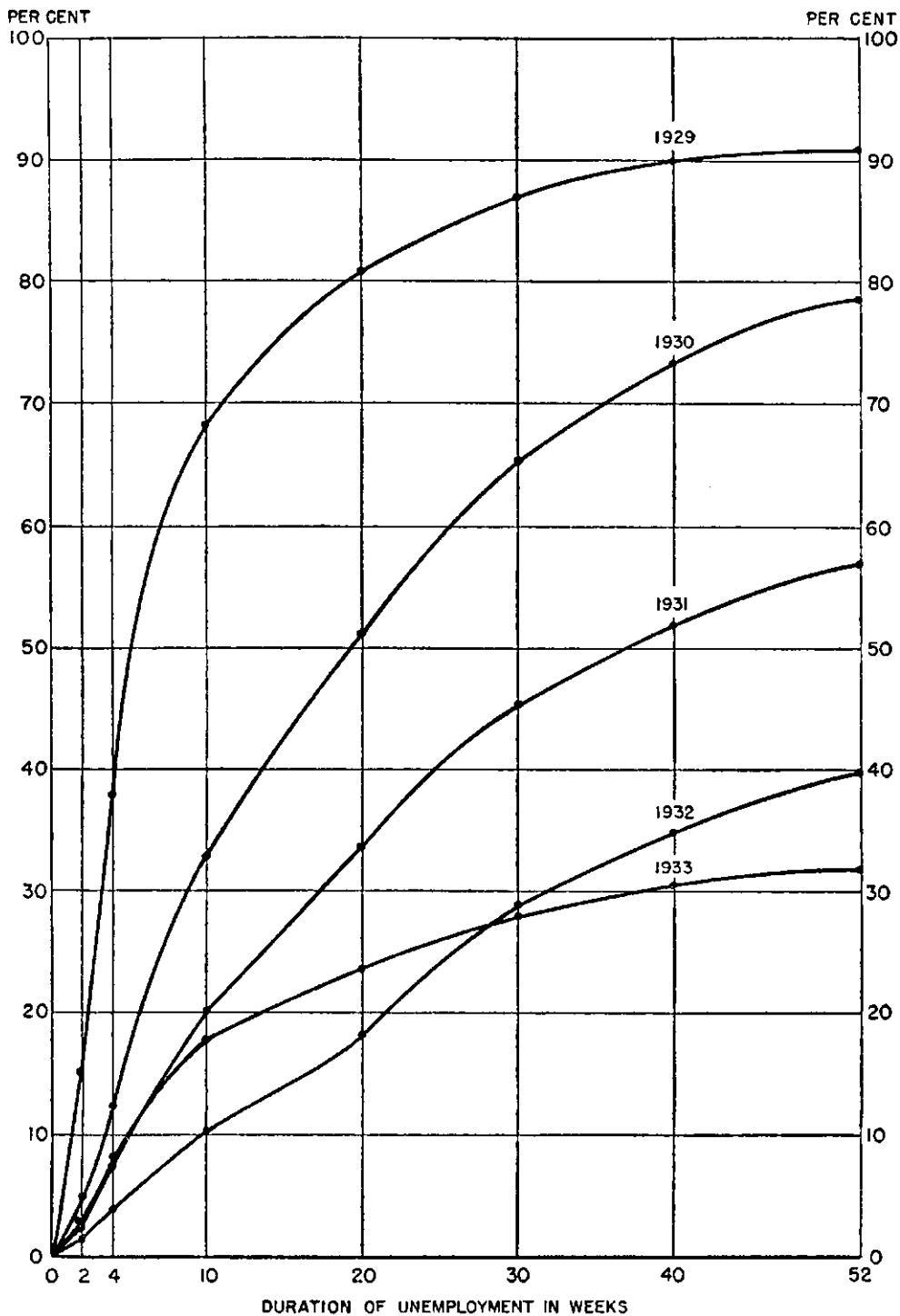
The conformation of the ogives for the years 1932 and 1933 on Diagram XIV appears to be typical of the labor market near the depth of the depression, showing the conditions before and after the upturn in business in March-April 1933.

Persons reporting as unemployed at one enumeration who had been unsuccessful in job-hunting necessarily appeared in the group with 52 weeks and over of idleness at the next enumeration. From the statistics shown in Table 12 and the unemployment rates on page 94, the rate of turnover of the unemployed in each year may be deduced. The following percentages of persons unemployed in November of the preceding year were hired before November of the specified year:

1930.....	41.6 per cent
1931.....	39.2 per cent
1932.....	19.2 per cent
1933.....	40.0 per cent

DIAGRAM XIV

DISTRIBUTION OF UNEMPLOYED MEN BY DURATION OF IDLENESS, IN BUFFALO, NEW YORK, 1929 TO 1933



In other words, the average chance of being hired was about 4.3 per cent per month in 1930, 4.0 per cent in 1931, only 1.7 per cent in 1932, and 4.1 per cent in 1933.

As all individuals with 52 or more weeks of unemployment were classified in the Buffalo surveys in one open interval, these statistics do not reveal whether the chance of reemployment declined as the period of idleness lengthened. The sample enumerations taken in Lincoln, Nebraska, and in Philadelphia, which are reviewed in the following pages, give this information.

UNEMPLOYMENT IN LINCOLN, NEBRASKA, 1932 AND 1933

Two unemployment enumerations were made in Lincoln by students of the state university, the first in November 1932 and the second in November 1933. These surveys, which were planned during the worst of the depression, provide a classification of the long-term unemployed.

(See Table 13.)

Persons returned in November 1933 as having been unemployed for a period of less than 52 weeks were those who lost their jobs or entered the labor market after the preceding enumeration. Persons who had been unemployed less than 52 weeks in November 1932 and had found no employment since would appear in the group unemployed from 52 to 103 weeks in November 1933, and those unemployed from 52 to 103 weeks at the first enumeration should have reported 104 to 155 weeks of idleness in the second enumeration. Therefore, a comparison of the magnitude of the respective unemployment duration groups in the two surveys casts light on the turnover in the different groups of unemployed in the intervening 12-month period.

It appears that the proportion of workers reported in November 1933 as unemployed for 3 years or more (20.6 per cent of 19.8 per cent, or about 4.1 per cent of all workers in the canvassed area) was slightly larger than the proportion of persons reported idle for 2 or more years in November 1932 (19.3 per cent of 17.9 per cent or about 3.5 per cent of the labor force). This obvious contradiction between the two reports might have been caused by minor changes in the composition of the working population, or

TABLE 13. DISTRIBUTION OF THE UNEMPLOYED BY DURATION OF IDLENESS, IN LINCOLN, NEBRASKA, NOVEMBER 1932 AND 1933

Duration of unemployment	1932			1933		
	Total	Male	Female	Total	Male	Female
UNEMPLOYMENT RATE	17.9	18.6	15.7	19.8	20.2	18.1
<i>Duration of Idleness</i>	<i>Percentage distribution</i>					
ALL DURATION CLASSES	100.0	100.0	100.0	100.0	100.0	100.0
Under 3 weeks	9.5	10.0	7.7	4.0	3.7	5.1
3 to 4 weeks	9.0	8.6	10.5	3.0	3.2	2.5
5 to 9 weeks	7.7	7.6	7.7	3.7	3.9	3.2
10 to 19 weeks	10.6	9.6	14.0	6.9	7.5	5.1
20 to 29 weeks	12.3	12.0	13.3	8.2	6.9	12.7
30 to 39 weeks	5.1	4.7	6.3	4.5	3.7	7.0
40 to 51 weeks	3.1	3.1	2.8	8.4	7.1	12.7
TOTAL, UNDER 52 WEEKS	57.1	55.5	62.2	38.7	36.0	48.3
52 to 103 weeks	23.6	24.1	21.7	18.7	18.6	18.9
104 to 155 weeks	19.3	20.4	16.1	21.9	23.5	16.4
156 weeks and over				20.6	21.8	16.4

Source: University of Nebraska, "Unemployment in Lincoln, Nebraska, November 1932," *ibid.*, November 1933. Percentages are computed.

by some inconsistency in classification.¹² Moreover, differences of this size are practically unavoidable in sample surveys. In any case, it is clear that most of the persons who had been out of work for 2 years before November 1932 were still idle one year later.

Likewise, the number of persons unemployed 2 to 3 years before November 1933 (18.7 per cent of 19.8 per cent, or 3.7 per cent) was very close to that of persons with 1 to 2 years of unemployment in November 1932 (23.6 per cent of 17.9 per cent, or 4.2 per cent). On the contrary, the number of persons with 1 to 2 years of idleness in November 1933 amounted to only 36 per cent of the number of persons idle less than 1 year at the previous enumeration.

This seems to indicate that while most of the persons reporting a comparatively short spell of unemployment in November 1932 had been reemployed during the following 12 months, there was no substantial movement back to regular jobs in the group of persons who reported a year or more of continuous unemployment

¹² Apart from other considerations, the vagueness of the demarcation line between the unemployed and the unemployable should be kept in mind; in marginal cases the term "unemployed" may have been more liberally interpreted in 1933 than in 1932.

in the 1932 survey. They formed part of the hard-core, which, of course, does not mean that they would not shift to the turnover group in an advanced phase of recovery.

UNEMPLOYMENT IN PHILADELPHIA, 1931 TO 1938

The unemployment censuses begun in Philadelphia in 1929 by the Industrial Research Department of the University of Pennsylvania, and continued after 1935 in cooperation with the National Research Project of the Works Progress Administration, report the extent and composition of unemployment in this industrial area.¹³ They refer to April and May of each year, except 1934 and 1938 when the surveys were made in February and July-August respectively. The duration distribution statistics, available for every year except 1934, are briefly summarized in Table 14.

According to this tabulation, the highest level of unemployment was reached in Philadelphia in 1933 (46.6 per cent among men and 44.2 per cent among women workers in canvassed families); it declined thereafter until 1937 and increased again in 1938. There were considerable variations in the distribution of the unemployed by duration of idleness groups. The proportions of newly separated workers declined from 1931 to 1935, increased the two following years and dropped slightly in 1938, while the highest proportion of unemployed with 4 or more years of continuous idleness was found in 1937.

The numbers of individuals unemployed less than 1 year, 1 but less than 2 years, 2 but less than 3 years, etc., as a per cent of all enumerated employable persons, varied as shown in the tabulation on page 101.¹⁴

Assuming that the canvassed families were representative of the whole labor market in Philadelphia, the percentages in this tabulation must be roughly proportionate to the absolute numbers

¹³ Gladys L. Palmer, *Recent Trends in Employment and Unemployment in Philadelphia* (Philadelphia: Works Progress Administration, December 1937).

¹⁴ The circles in each column indicate the duration-of-idleness intervals. The number in each circle shows the proportion of enumerated employable persons in the specified duration interval as returned by the enumeration. The arrows indicate the group to which the unemployed tabulated in the given interval would be transferred at the next enumeration if they remained unemployed. The figures for 1934 have been obtained by interpolating the data for 1933 and 1935.

TABLE 14. DISTRIBUTION OF THE UNEMPLOYED BY DURATION OF IDLENESS, IN PHILADELPHIA, 1931 TO 1938^a

Item	1931	1932	1933	1935	1936	1937	1938
MALE							
ENUMERATED EMPLOYABLE PERSONS...	48,641	48,526	48,320	55,775	54,989	55,848	54,005
Unemployed:							
Absolute number.....	12,839	20,681	22,539	18,332	15,915	13,018	16,834
In per cent.....	26.4	42.6	46.6	32.9	28.9	23.3	31.2
<i>Duration of Idleness</i>							
<i>Percentage distribution</i>							
ALL DURATION CLASSES...	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Under 2 months.....	22.1	15.7	9.7	5.8	13.1	18.7	17.5
3 to 5 months.....	26.9	16.2	8.4	10.0	10.1	9.6	14.4
6 to 8 months.....	15.9	10.5	7.9	7.4	7.0	5.8	12.5
9 to 11 months.....	13.8	18.1	14.4	7.6	7.0	4.2	7.2
TOTAL, UNDER 1 YEAR....	78.7	60.5	40.4	30.8	37.2	38.3	51.6
1 but less than 2 years..	15.5	28.7	34.0	18.3	16.3	13.7	14.1
2 but less than 3 years..	3.0	7.5	17.7	16.0	12.1	10.3	8.6
3 but less than 4 years..	1.3	1.8	5.0	14.1	10.6	8.3	6.5
4 but less than 5 years..	0.6	0.7	1.7	10.5	9.1	7.8	4.4
5 years and over.....	0.9	0.8	1.2	10.3	14.7	21.6	14.8
FEMALE							
ENUMERATED EMPLOYABLE PERSONS...	16,944	17,953	17,896	22,749	24,833	23,758	21,397
UNEMPLOYED:							
Absolute number.....	4,019	7,322	7,904	7,578	8,152	6,439	7,696
In per cent.....	23.7	40.8	44.2	33.3	32.8	27.1	36.0
<i>Duration of Idleness</i>							
<i>Percentage distribution</i>							
ALL DURATION CLASSES...	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Under 2 months.....	33.0	27.1	17.8	8.2	17.0	27.2	23.2
3 to 5 months.....	26.8	20.4	12.2	15.1	12.0	12.9	14.2
6 to 8 months.....	11.5	8.9	11.0	8.1	6.6	6.1	11.8
9 to 11 months.....	12.3	18.1	17.2	12.3	9.2	5.0	6.9
TOTAL, UNDER 1 YEAR....	83.6	74.5	58.2	43.7	44.8	51.2	56.1
1 but less than 2 years..	12.4	18.8	26.2	21.5	17.1	13.9	15.3
2 but less than 3 years..	2.2	4.5	10.7	15.2	10.8	8.8	9.1
3 but less than 4 years..	0.9	1.3	2.9	8.4	7.7	6.5	5.3
4 but less than 5 years..	0.3	0.5	1.1	5.4	5.8	5.4	3.9
5 years and over.....	0.6	0.4	0.9	5.8	13.8	14.2	10.3

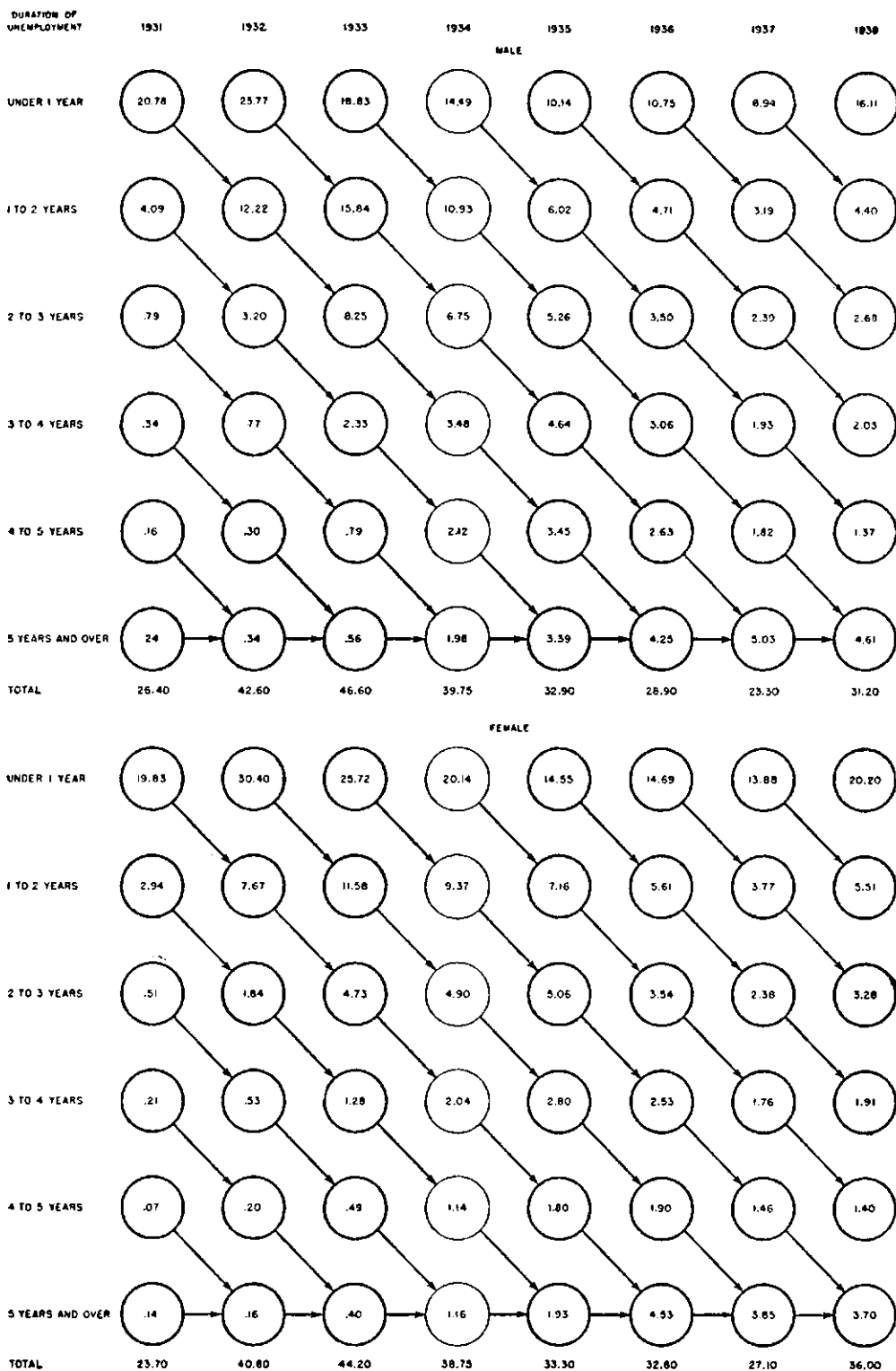
^a Data are for April-May of each year, except 1938 when the survey was made in July-August.

Sources: Gladys L. Palmer, *op. cit.*, pp. 47, 57; *Employment and Unemployment in Philadelphia in 1936 and 1937*, p. 26.

of individuals in each duration class at the date of the survey. Accordingly, by comparing an item in a given column with the item for the next higher duration class in the next following column, the proportion of persons with the given duration of idleness who have been reemployed between the two surveys may be determined. These proportions will show the chance of reemploy-

DISTRIBUTION OF THE UNEMPLOYED BY DURATION OF IDLENESS IN PHILADELPHIA

(in per cent of all workers canvassed)



ment during a year for different duration of idleness classes in different phases of the depression.¹⁵

In the spring of 1931 there were already workers in the labor market whose last jobs had terminated before May 1929. They constituted about 1.5 per cent of all male workers and less than 1.0 per cent of the female workers. As these persons had practically no chance of being hired in the period of rapidly declining demand for labor, they formed the first nucleus of the hard core. Most of them were probably found in the group with 3 years of unemployment in 1932, in the 4-year group in 1933, and in the group with 5 years or more of idleness in 1934.

Persons unemployed 1 to 2 years in the spring of 1931, i.e., those who had lost their jobs between May 1929 and May 1930, had a fair chance of being hired, but up to May 1934 only 50 per cent of the men and 70 per cent of the women in this group were reabsorbed by private employment.

On the other hand, about 40 per cent of the workers discharged between May 1930 and May 1931 (i.e., those who had been out of work less than 1 year when the 1931 enumeration was taken) found employment before May 1932, and an additional 20 per cent of the same group were hired between the 1932 and 1933 surveys. The chance of reemployment for this group of workers diminished considerably thereafter. By May 1933 about 15 per cent of the men and 10 per cent of the women in the same group were still seeking jobs.

The hiring chances for different duration of unemployment groups shown in the following tabulation are deduced from the tabulation on page 101 and Table 14. They suggest that during the depression, and especially in its advanced phase, the more recently discharged workers had a much better chance of finding jobs than those who had lost their jobs before the autumn of 1929 or soon thereafter.

¹⁵ Two reservations are necessary: first, the decrease in the individual duration groups could be accounted for not only by the reemployment of persons in these groups, but also by voluntary withdrawals from the labor market or by death; second, the size of the highest duration groups may vary because of an inconsistency in drawing the demarcation line between hard-core unemployed and unemployable persons.

Estimated Chance of Being Hired During a 12-Month Period After the Specified
Duration of Unemployment ¹⁶

Duration of unemployment	May 1932	May 1933	12-month period ending				
			May 1934 ¹⁷	May 1935 ¹⁷	May 1936	May 1937	August 1938
<i>Male</i>							
Under 1 year	0.41	0.39	0.48	0.48	0.54	0.70	0.40
1 but less than 2 years	0.22	0.23	0.46	0.46	0.42	0.50	0.13
2 but less than 3 years	0	0.28	0.44	0.46	0.42	0.46	0.12
3 but less than 4 years	0	0	0.20	0.25	0.43	0.41	0.23
4 years and over	0	0	0	0	0	0	0.26
<i>Female</i>							
Under 1 year	0.61	0.66	0.60	0.60	0.62	0.74	0.48
1 but less than 2 years	0.40	0.40	0.50	0.50	0.51	0.57	0.12
2 but less than 3 years	0	0.38	0.50	0.50	0.51	0.50	0.16
3 but less than 4 years	0	0	0.10	0.25	0.32	0.42	0.17
4 years and over	0	0	0	0	0.50	0.40	0.24

¹⁶ The zeros in this tabulation do not mean that there was absolutely no turn-over in the respective groups of the unemployed. They suggest only that the number of occasional hirings was so small that they failed to leave any trace in available statistics.

¹⁷ Based on interpolation.

PART III. ADDITIONAL WORKERS IN
DEPRESSIONS

CHAPTER X

OBJECTIVES, CONCEPTS AND FINDINGS

THE TERM "ADDITIONAL WORKER," in contrast to "usual worker," may be applied in its broadest sense to all persons who are not regularly engaged in gainful pursuits but appear on the labor market under certain business conditions. This study is confined to those "additional workers" who are in the labor force because the usual breadwinners in their families are unemployed and who, if this were not the case, would not seek work. They may be new workers, reentrants, or persons who have remained on the labor market beyond the age at which they otherwise might have retired.¹

"Additional workers" in both the broad and narrow sense of the term should be distinguished from those temporary workers whose entry into the labor market is governed by seasonal fluctuations. In summer, for example, the labor force is generally inflated by about 2 million high school and college students. Each spring the agricultural labor force is increased by at least 1 million members of farmers' families who withdraw from the labor market several months later, after the harvest. Most of the temporary workers employed in retail trade during the Christmas season are not part of the labor force during the rest of the year. The total number of persons who regularly enter and withdraw from the labor market in certain seasons may range between 3 and 4 millions. To a large extent this seasonal increment offsets certain seasonal variations in the demand for labor, and therefore in spite of the considerable volume of these variations, they may be eliminated from labor market analysis if the purely seasonal ser-

¹ The term "additional worker" as defined here should not be confused with "supplementary" or "secondary worker," which usually refers to all earners within the same family unit other than the principal breadwinner. In the present study the term "secondary" is reserved to describe that unemployment which results from the influx of additional workers into the labor market (which has sometimes been referred to as "derived" or "induced" unemployment). The concept of "additional worker" in the narrow sense is identical with the term "forced entrant" which is used in some labor market studies.

vices for which these temporary workers are usually hired are excluded from the picture.

It is hardly possible, however, to analyze the labor market under varying business conditions without reference to the cyclical changes in the labor force represented by the "additional workers" as defined above. In periods of exceptional demand for labor they are an important part of the reserve from which labor shortages are met;² in depressions their entry into the labor market intensifies the competition for available jobs and increases the number of jobseekers. Since the statistical characteristics of persons forced into gainful work or jobseeking by the unemployment of the usual workers in their families differ considerably from those of workers who enter the labor market when the supply of regular workers is less than the demand, different methods are required to measure the two groups.

The additional workers who are in the labor force because the usual earners in their families are unemployed may be described as "additional depression workers" provided that the term "depression" is not restricted to the lowest point of the business cycle. Local and partial slumps, as well as technological changes resulting in layoffs, are likely to add new jobseekers to the ranks of the unemployed even if the overall business conditions prevailing at the time are generally good. Consequently "additional depression workers" may be present on the labor market wherever and whenever some usual workers are out of work, but they are naturally most numerous during depressions.

Because of the influx of additional jobseekers in periods of declining demand for labor, the number of persons looking for work tends to outrun the number who have lost their jobs. On the other hand, with progressing recovery the reemployment of usual gainful workers is likely to bring about the gradual withdrawal of some of the additional jobseekers. Therefore the number of jobs necessary to reduce unemployment to the minimum amount required to permit normal turnover in the labor market may be appreciably less than the reported volume of unemployment would suggest.

² The presence of additional workers in the labor market in boom periods is evidenced by the fact that a comparison of the volume of employment with the "normal" supply of labor in these periods may indicate "negative unemployment." (Cf. Part II, Chapter VIII, pp. 78-79.)

A census of unemployment cannot segregate additional workers from persons usually engaged in gainful pursuits, and an attempt to distinguish between these two types of unemployment in the census schedule might be regarded as unjustifiable discrimination against certain groups of workers. But a realistic approach to unemployment problems requires a clear distinction between "primary" and "secondary" unemployment, i.e., between the deficit in the number of jobs compared with the number of usual gainful workers, and the increase in the number of jobseekers caused by this deficit.

The objective of Part III of this report is to cast light on the variations in the number of additional workers in different phases of the depression. Before proceeding with a presentation of the findings, the underlying concepts are elaborated.

ADDITIONAL WORKERS AND ESTIMATES OF UNEMPLOYMENT

The presence of additional workers in a depression labor market constitutes one of the main difficulties in estimating unemployment. In fact, their presence requires adjustments in order to check monthly estimates of unemployment directly with the returns of a census.

Several organizations have prepared such estimates in the past decade. The series of the National Industrial Conference Board, Alexander Hamilton Institute, American Federation of Labor, Robert R. Nathan, and the Cleveland Trust Company are among those most frequently quoted. The striking discrepancy between them is the more remarkable in view of the fact that they all used the same "subtraction method."³ On the basis of the 1930 Census of Population and other statistical sources, they established the probable number of unemployed individuals for a date selected as the base. Then the probable influence of the growth of the population on the number of gainful workers was computed. Further, with the aid of official employment indexes and other sources, they calculated the variations in employment after the base period, and obtained the volume of unemployment at a given date by subtracting the number of employed workers from the estimated

³ Cf. Woytinsky, "Controversial Aspects of Unemployment Estimates in the United States," *Review of Economic Statistics*, May 1941, pp. 68-77.

number of persons available for employment.⁴ In other words, in all of these series the number of unemployed (U) was determined from the equation

$$U = W - E \dots \dots \dots (1)$$

where (W) is the assumed number of gainful workers (without allowing for additional workers) and (E) is the estimated number of employed among them.

In this equation, (W) may be established with sufficient accuracy, but there is considerable probability of error in estimating (E). First, the available employment indexes do not cover all industries and occupations; second, they are based on samples which may or may not be representative for the specified industries; and third, even those which reflect adequately the short-time variations in employment, cannot show the long-time changes with equal accuracy. The third source of error is particularly important because almost all employment indexes tend to deviate downward as time goes on, and an accumulated 5 per cent underestimate of employment may result in a 30 or even 50 per cent overstatement of unemployment.

If the number of gainful workers were actually (W) and were not affected by the entry and withdrawal of additional workers, the estimated volume of employment and unemployment could be checked with the returns of a direct enumeration at a specified date. But the presence of additional workers in the labor market distorts the results of the checking. If the number of unemployed returned by an enumeration (U') appears larger than the estimated difference (W-E), the disparity may be accounted for by the entry of additional workers, and it is not known whether the estimate of employment was or was not correct. If the returned (U') is equal to or less than the difference (W-E), this may be interpreted as evidence that the enumeration was incomplete, but the importance of the error remains unknown. Besides, when the demand for labor is particularly large, the estimated employment may exceed the estimated number of gainful workers by millions, so that the theoretical unemployment is

⁴ See R. P. Falkner, "Estimating Employment and Unemployment," *Bulletin of the National Industrial Conference Board*, August 10, 1936; Leonard Kuvin, "Revised Estimates of Employment and Unemployment," *ibid.*, May 24, 1937; R. A. Nixon and P. A. Samuelson, "Estimates of Unemployment in the United States," *Review of Economic Statistics*, August 1940.

negative, and again it remains a question of guessing how to interpret this phenomenon. In fact, since there are persons out of jobs even at the peak of prosperity, the actual volume of unemployment never drops to zero, and it is certain that the influx of additional workers must be larger than the supposed negative unemployment, but one does not know how much larger it is.

A check of unemployment estimates with the returns of a direct enumeration would be comparatively easy if the probable number of additional workers (Δ) among the total gainful population were known. In case this number is known, equation (1) would be replaced by the formula

$$U = (W + \Delta) - E \dots \dots \dots (2)$$

where (W) and (E) have the meanings given above. Hence, if the numbers of usual and additional workers (W and Δ) are known, and the actual volume of unemployment (U') is established with sufficient accuracy, the estimate of employment (E) for the date of the enumeration may be checked, using the formula

$$E = W + \Delta - U' \dots \dots \dots (3)$$

Assuming that some multiplier (M) exists which expresses the relationship between the number of additional workers forced into the labor market because of the unemployment of usual earners in their families, and the number of usual workers who are unemployed because of slack business conditions, the increments in the number of unemployed after a specified date must be (M) times the difference between the increments in the "normal" labor force and in employment, so that

$$dU = (dW - dE) \cdot M \dots \dots \dots (4)$$

The excess of (M) over 1 in this formula represents the ratio of "additional depression workers" to usual gainful workers out of jobs. If the limits within which (M) is likely to vary are established—for example, if it ranges between 1.1 and 1.3 or between 1.15 and 1.25—this would be of great help in interpreting the returns of unemployment censuses, as well as in appraising monthly estimates of employment and unemployment.

It will be noticed that this method cannot be used to measure the probable entry of additional workers in prosperity, and this is why in the present study the attempt to measure the multiplier

(M) is restricted to the labor market in depressions. However, for a clearer presentation of the problem, brief prefatory observations on variations in the supply of labor and "primary" and "secondary" unemployment are necessary.

VARIATIONS IN THE SUPPLY OF LABOR

Variations in the supply of labor, both in depression and boom periods, result from three movements: (a) the *trend* in the volume and composition of the population as determined by the coming of age of new workers, the retirement or death of older workers, the withdrawal of married women from gainful occupations, and the like; (b) *seasonal* rhythm in the appearance on the labor market of temporary workers employed by certain seasonal industries and in the entry into gainful pursuits of young workers leaving school; and (c) *cyclical* changes in business conditions which result in the influx or withdrawal of additional jobseekers.

Only the general trend is usually taken into account in estimates of unemployment. Inasmuch as exact information is not available on the number of new additions to the labor supply who have reached working age, and of withdrawals because of retirement, death or disability, usually the net upward trend is calculated roughly by applying the proportion of gainful workers in each sex and age group of the population, as reported by the last census, to the changing number of individuals in each of these groups. This procedure is based on the assumption that the steadily increasing participation of married women in gainful work is approximately counterbalanced by the shrinkage in the number of children in the labor force. In monthly estimates of unemployment the supposed net increase in the number of gainful workers in each year is prorated over the 12 calendar months, so that the growth in the supply of labor during each year is represented by an ascending straight line.

When seasonal factors are taken into account, the straight line becomes a wavy one. If only the timing of the entry of young workers is taken into consideration, and because of the lack of information no correction is attempted for the other types of seasonal fluctuations, the line runs almost horizontally in the first half of the year and all of the rise is concentrated in the second half.

Cyclical changes in business conditions affect the number of gainful workers in many ways. The influx of additional jobseekers during a depression (forced entries) may be partly counterbalanced by the withdrawals of persons who realize they have no chance of employment (forced exits). On the other hand, as shown by the estimates of Paul Douglas referred to in Chapter VIII of Part II, the actual volume of employment in prosperity periods may outrun the normal supply of labor. There are indications that this was the case in the early autumn of 1929. If the number employed just before the collapse was inflated by additional workers, this might affect the returns of the census of April 1, 1930 and all the estimates of unemployment during the past decade.⁵

As pointed out earlier, the entry of additional workers into the labor market in periods of intense business activity does not necessarily mean that the reserves of regular gainful workers have been completely exhausted. There may be an acute shortage of labor in certain areas, industries and occupations, while in others hundreds of thousands of individuals may be unemployed. This situation has developed in the second half of 1941. The defense program has brought into the labor market hundreds of thousands of married women and has allowed many aged persons to return to gainful work, while at the same time other thousands have remained on the rolls of relief agencies.

Since in prosperity as in depression, additional workers enter the labor market from those population groups which under other business conditions are not engaged in gainful work, it is natural that women, and more specifically married women, prevail among

⁵ R. R. Nathan estimated that the number of employed persons in October 1929 was 3,731,000 larger than in April 1930, and that during the same period the number of gainful workers increased by 195,000. ("Estimates of Unemployment in the United States, 1929-1935," *International Labour Review*, January 1936, Table II.) Accordingly, unemployment should have increased by 3.9 million between October 1929 and April 1930. Since the 1930 census counted only 3.2 million unemployed (Classes A and B), this led Nathan to assume that the 1930 unemployment figures were understated. (This was confirmed in his opinion by the disparity between the 1930 and January 1931 unemployment figures.) He increased the 1930 figures to 4.4 million, which resulted in an estimate of 500,000 unemployed in October 1929. It is hardly possible, however, that at the peak of a business boom unemployment was less than 1.5 millions (5 per cent of the industrial wage and salary earners). If since then unemployment increased by 3.9 millions, on April 1, 1930 there should have been not 4.4 but 5.4 million unemployed workers, unless the labor force in 1929 included many additional workers who withdrew from the labor market after the collapse and were not reported by the 1930 census either as unemployed or as gainful workers.

them. This composition of additional workers does not facilitate an estimate of their probable number. The haziness of the concept of "gainful worker" or "employable person," as it is applied to married women, and the flexibility of this group with respect to potential expansion or contraction of the labor supply, have been pointed out by Samuel A. Stouffer and Paul F. Lazarfeld.⁶ However, they could not find statistical evidence of a large increase during the depression years in the proportion of married women among gainful workers. The 1937 Census of Partial Employment, Unemployment and Occupations suggested, on the contrary, that there had been a tremendous influx of married and single women into gainful employment since 1930.

Whether or not this influx was as large as it appears in this census, most students now agree that the supply of labor tends to increase with the severity of a depression.⁷ To put it in more general terms, at any time there are in the nation, besides persons regularly engaged in gainful pursuits, a large number of persons who sometimes are and sometimes are not part of the labor force; some of them enter the labor market in prosperity periods, others in times of depression.

Therefore, variations in the number of gainful workers should be represented, not by a smooth wavy line like the double curve on Diagram XV, but rather by a winding curve, such as the dotted line in the same chart. The scale of this diagram and the variations in employment and unemployment are fictitious, the purpose being to emphasize the types of movements rather than their dimensions.⁸

⁶ *Research Memorandum on the Family in the Depression* (New York: Social Science Research Council, 1937), Bulletin 29, p. 43.

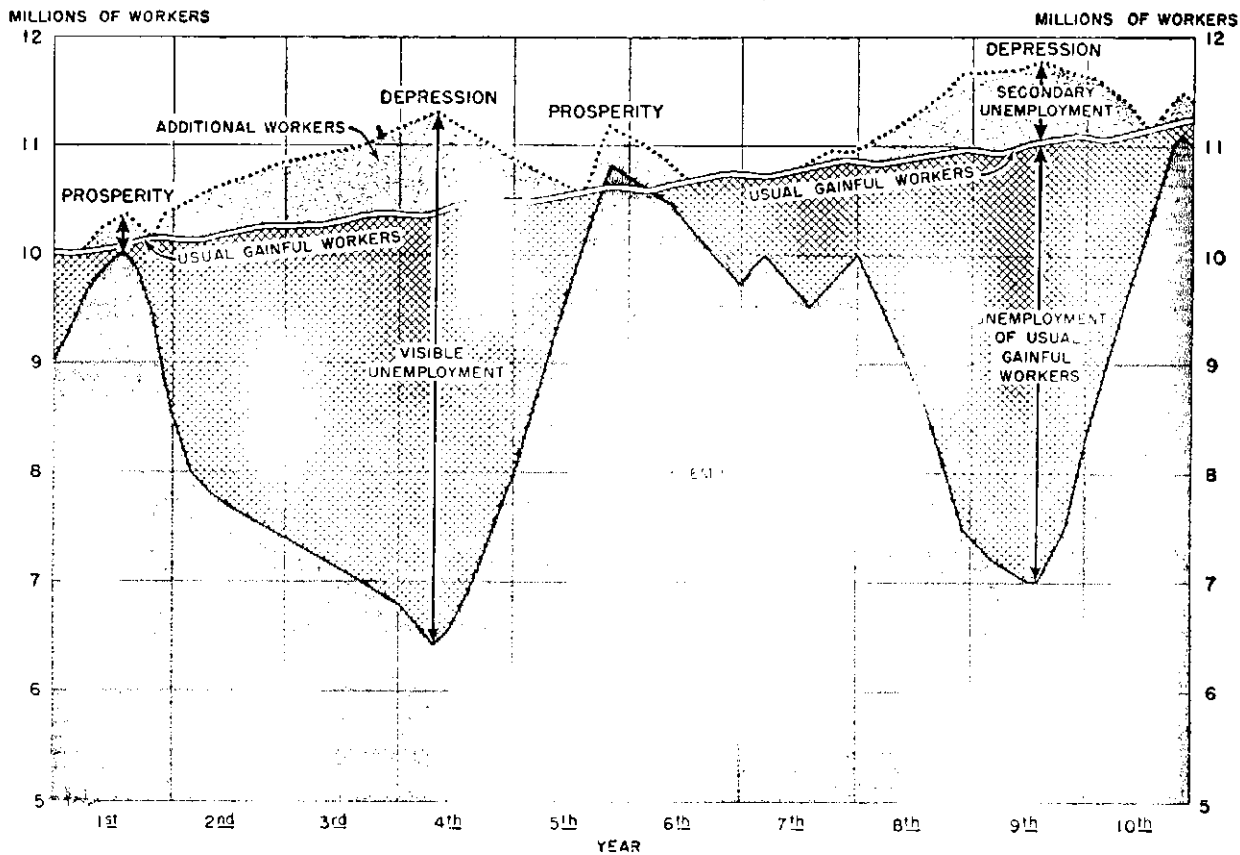
⁷ While the entry of additional jobseekers into a depression labor market has been generally recognized, no allowance has been made for them in the unemployment estimates of the past decade. "Many are of the opinion that, wholly apart from any shifting in the population age groups, the conditions of the depression have greatly increased the number of those who might appropriately be called employables. Reduced incomes have, they say, forced a more than usual proportion of young people and married women to seek gainful work and have brought back into the labor market numbers of men who have previously retired. However reasonable such assumptions may appear, the better known estimates of unemployment have not seen their way clear to including them in their calculations." (National Industrial Conference Board, *Bulletin* of August 10, 1936, p. 63.)

⁸ In accordance with the objective of this analysis, the chart stresses the entry of additional workers in depressions and shows their entry at the peak of prosperity on a smaller scale. This should not, however, be construed as meaning that prosperity cannot bring a larger number of new workers into the labor market than a depression.

DIAGRAM XV

EXAMPLE OF THE INFLUX OF ADDITIONAL WORKERS INTO THE LABOR MARKET RESULTING FROM AN UNUSUALLY LARGE DEMAND FOR LABOR OR THE UNEMPLOYMENT OF USUAL WORKERS

(Fictitious numbers)



"PRIMARY" AND "SECONDARY" UNEMPLOYMENT

Only a painstaking analysis of the work history and family status of each individual would give unquestionable evidence that he or she is a usual gainful worker or an additional worker who entered the labor market because of the unemployment of the usual family breadwinner. But even without a classification of individual cases, it is possible to segregate existing unemployment into two parts: "primary" unemployment due to an inadequate number of jobs for usual gainful workers; and "secondary" unemployment accounted for by new jobseekers from families in which the usual earners are unemployed. The premise of this segregation is that the numbers of employed and unemployed workers at a date when the labor force was only moderately inflated have been established with sufficient accuracy, and that these figures are used as a bench mark for further computations. If the number of gainful workers is higher than might reasonably be expected, or if actual unemployment exceeds the level justified by the decline in demand for labor and the growth of population, this may be regarded as evidence of "secondary" unemployment.

On Diagram XV the varying volume of secondary unemployment is represented by the distance between the dotted curve (all persons available for work, usual plus additional gainful workers) and the double wavy line (usual gainful workers). At any given time secondary unemployment is measured by the number of additional workers on the labor market. It is recognized, however, that secondary unemployment and the additional labor force are not necessarily composed of the same individuals, since those additional jobseekers who have succeeded in their search for work are classified as employed. However, during a depression, the employment of some of the additional workers must cause the unemployment of some usual workers who then are counted in secondary unemployment.⁹ With this in mind, it would be easy to establish the number of additional workers (or to measure the volume of secondary unemployment) if the actual volume of unemployment and the volume it would have been without additional workers were known.

⁹ This statement involves no judgment of the right of new workers to compete for jobs.

A comparison of the returns of decennial censuses is not practical in view of considerable changes in the structure of population which are likely to take place between them. Besides, changes in methods and classification make the comparison difficult. Successive local enumerations made in the same month each year could provide a basis for comparison if they used the same definitions and classifications, and if there were no considerable migration into or out of the canvassed area between enumerations. As none of these conditions was met by the local enumerations taken in the last decade, however, they fail to show the volume of cyclical variations in the supply of labor.¹⁰ For similar reasons the 1937 Census of Unemployment could not cast light on the flow of additional workers during the depression.¹¹

Since direct statistical data on the variations in the number of additional workers on the labor market is not available, this number must be estimated on the basis of indirect information.

Proceeding on the theory that the unemployment of the usual family breadwinner may cause his wife, children or other dependent relatives to seek work, traces of this movement should be discernible in the structure of workers' families. Some of the

¹⁰ The Michigan Census of Population and Unemployment taken in January 1935 and the Decennial Census of Population in Rhode Island in January 1936 may be cited as examples. The Michigan census reported that on January 14, 1935 "employable" persons (working or seeking work, over 15 years of age) constituted 38.7 per cent of the state's population, or 53.7 per cent of the population over 15 years of age, compared with 39.7 and 56.0 per cent returned on April 1, 1930. The proportion of gainful workers among men over 15 years dropped from 86.6 to 83.6 per cent, while it increased from 22.0 to 22.1 per cent among women of the same ages. (*Age, Sex and Employment Status of Gainful Workers in Five Types of Communities* [Lansing: State Emergency Welfare Relief Commission, July 1936], p. 1.) The explanation of these figures is found in the returns on the net change in the state's population over 15, which decreased from 3,436,000 in 1930 to 3,392,000 in 1935, a decline of 44,000 instead of the growth of 237,000 anticipated in accordance with the net balance of births and deaths after 1930 (without internal migration). (Warren Thompson and P. K. Whelpton, *Estimates of Future Population by States* [Washington: National Resources Board, December 1934].) The decline of about 281,000 in the number of persons over 15 is evidence that about this many persons left the state during the depression and it is fairly probable that most of them were gainful workers.

In Rhode Island the 1936 census showed a decline in the proportion of gainful workers among men over 10 years of age from 77.2 to 71.0 per cent, and among women of the same ages, from 30.4 to 27.8 per cent. The report points out that the decline was restricted to the younger and older age-classes, while among men and women 25-44 years the proportion of gainful workers was about the same in 1936 as in 1930. But from 1930 to 1936 the state lost about 1 per cent of its population, while the net balance of births and deaths had indicated an increase of 4 per cent.

¹¹ See Chapter XVII.

former one-worker households with unemployed heads would become two-worker families, some of the two-worker families would shift into the group with three workers, and so on. Differentials must therefore develop in the proportions of one-worker and multi-worker families among households with and without unemployment, and when these differentials are revealed by enumerations they may be used as the basis for estimating the probable number of additional jobseekers on the labor market. A census is bound, however, to distort these differentials: instead of reporting an abnormally high number of jobseekers in families with unemployed usual earners, it will register merely an abnormally low unemployment rate in one-worker families, which would imply that these families were threatened by unemployment less than multi-worker households. This is the origin of current references to the "concentration of unemployment in large families" or "differential rates of unemployment between one-worker and multi-worker families"¹²—generalizations in which the cause and consequence are not clearly distinguished.

FINDINGS IN BRIEF

Methods of Measuring Secondary Unemployment

The three methods of measuring secondary unemployment, developed in Chapter XI, are all based on the observation that during depressions additional workers enter the labor market from families in which the usual breadwinners are out of work. This statement implies that the number of additional workers may be roughly measured by the increase in the number of gainful workers in families with unemployed usual earners. The exact number of workers these families would have had if their usual earners were employed is, of course, unknown, but it may be assumed with rough approximation that, except for additional workers, there would be no substantial difference between the structure of these families and of those without unemployed members. In other words, the estimate rests on the hypothesis that unemployed

¹² See Don D. Humphrey, "Interpreting Unemployment in Terms of Family Units," *Journal of Political Economy*, February 1939, pp. 82 ff.; "Alleged Additional Workers in the Measurement of Unemployment," *ibid.*, June 1940, pp. 412-19. Cf. W. S. Woytinsky, "Additional Workers on the Labor Market in Depression," *ibid.*, October 1940, pp. 735-39.

usual workers are distributed more or less evenly among families of different types and sizes. The precise meaning of this assumption should be kept in mind. The distribution of unemployment by families is no more random than its incidence among individuals, or the distribution of deaths, births or automobile accidents. The hypothesis does not deny the correlation of the chance of unemployment in families of different types with the personal characteristics of their members. It denies only its significant correlation with the number of usual earners in the household.

The methods developed in Chapter XI for estimating the number of additional workers, based on this hypothesis, are summarized below. Each of them is applicable to a specific type of statistics.

(1) In the case of reports which show the number of workers and of families, and the number of unemployed persons and of households with unemployment, three rates are computed: the number of gainful workers per family; the proportion of unemployed among all gainful workers; and the proportion of households with unemployment. Since there is more than one worker per family, the proportion of households with unemployment is always larger than the proportion of unemployed among gainful workers; also, for any given unemployment rate among individuals, the probability that unemployment will be found in a family must increase with the number of workers per family. Assuming that the risk of unemployment for the individual does not vary with the number of earners in the household, the unemployment rate combined with the number of gainful workers per family should determine the theoretically probable proportion of families with unemployment.¹³ On the same assumption the pro-

¹³ This assumption deliberately simplifies the real conditions on the labor market. Many factors which are extremely difficult to measure may have a conflicting influence on the individual risk of unemployment. For example, the wives and children of irregularly employed and poorly paid workers are more likely to be forced into the labor market than are the family members of steadily employed and well paid workers, and this may cause the proportion of multi-worker households with unemployed heads to be larger than the proportion with employed heads. On the other hand, in view of the lower unemployment rate among women and the fact that the second worker in a family is very often the wife, the individual risk of unemployment in two-worker families may be somewhat smaller than in one-worker families. If a third breadwinner in a family should be a young son or daughter, the average individual risk of unemployment in this household would be increased by the high unemployment rate

portion of families with unemployment combined with the number of gainful workers per family should determine inversely the theoretically probable rate of unemployment among individuals.

An analysis of available statistics suggests that the number of families with unemployment is usually not as large as it should be theoretically in accordance with the rate of unemployment among individuals and the number of workers per family. In other words, unemployment is concentrated in the same families, and there are more unemployed persons in households with unemployment than the theory of probability would lead one to expect. It would seem logical to conclude that the excess of jobseekers in these families is accounted for by the additional workers.

(2) In the case of census reports which show the distribution of unemployed persons by families, classified by the number of gainful workers per household, another and in some respects more exact method may be used. It is obvious that the entry of additional workers into the labor market from families with unemployed usual earners must cause a conspicuous disparity in unemployment rates for one-worker and for multi-worker households. Because of the entry of these workers, part of the unemployed one-worker families would become two-worker households, and consequently the unemployment rate for one-worker families would be lower than for other families. On the assumption that the unemployment of usual workers is distributed evenly among breadwinners in one-worker and multi-worker families, and that additional workers are evenly distributed among families with unemployed usual earners, the observed disparity in the unemployment rates in one-worker and multi-worker families provides a clue for a rough estimate of the probable number of additional workers.

The two methods are independent of each other. The first (concentration of unemployment by families) discloses only the additional workers who were out of jobs at the date of the enumeration. The second (differentiated unemployment rates in one-

among young persons. While the net balance of these and similar influences cannot be ascertained, it is likely that the entry of additional jobseekers occurs in all types of families with unemployed usual earners. It would hardly seem possible that this movement would be counterbalanced by "forced exits" from the labor market which are less probable in a family with an unemployed head than in a family with the head employed.

worker and multi-worker families) counts the employed and unemployed additional workers and therefore is likely to result in a higher rate of secondary unemployment.

(3) A more detailed picture of the probable results of forced entries is obtained if the unemployment census reports the employment status of households with a specified number of workers. After the extent of "secondary" unemployment has been established by either of the methods described above, the probable shifts of families with unemployed workers from one size-class into the next higher one are calculated. The theoretically probable unemployment rates in families of different sizes, and the probable distribution of these families between full employment, partial unemployment, and complete unemployment are determined, and the theoretically probable distribution of unemployment reconstructed. The obtained figures are checked with the census returns, and if they are in satisfactory agreement, the validity of the assumptions used for calculation is confirmed.

In some cases when a census reports data to which none of these methods can be applied, a systematic analysis of the individual items of the report may reveal the presence of additional workers and their probable number.

Concentration of Unemployment by Families in 1915

The first unemployment censuses in the United States, taken in 1915, are examined in Chapter XII as an example of the structure of unemployment unaffected by a lengthy depression and extensive relief programs. The depression which directed attention to unemployment at that time was in fact brief and was followed by a period of prosperity.

The 30 local enumerations of 1915 revealed a pronounced concentration of unemployment in the same families. The reported number of households with unemployed members was unexpectedly small in comparison with the unemployment rate among workers in canvassed areas and the number of workers per family, showing that in families where one worker was unemployed, there was a relatively high probability that another family member would be looking for a job. This suggests that the unemployment of usual earners had forced into the labor market some of their

dependents who were reported as unemployed. The censuses taken between January and July 1915 suggest that at the beginning of the year there was approximately one additional jobseeker per 5 or 6 usual workers out of jobs and that later their proportion declined with recovery.

Structure of Unemployment at the Beginning of the Depression (1930 Census)

The census of unemployment taken with the decennial census of population in 1930, discussed in Chapter XIII, reported neither the number of families in which there was unemployment, nor the distribution of unemployment by size or type of family, and none of the methods described in Chapter XI can be used to estimate the probable number of additional workers. But a comparison of the unemployment rates by sex and age groups, family status, marital status of women, occupation and industry, etc., suggests that there were a few additional workers on the labor market even in this early phase of the depression.

Considering only unemployed non-agricultural salary and wage earners, the unemployment rate for male family heads (including persons living alone) was about 9.3 per cent, and for related male family members, 11.5 per cent. For women, on the contrary, unemployment was more severe among the heads of "broken" families (usually widows or divorcees) than among related female family members, the respective rates being 8.7 and 4.8 per cent. As almost all male family heads are usual gainful workers, it is more likely that the additional male jobseekers would emerge from the group of related family members than from the group of family heads. On the other hand, not all women heads of "broken" families are usual gainful workers, and from this group additional jobseekers might come after the layoff of the usual family breadwinners. The higher-than-average unemployment rates are reported precisely in those sex, age, and family relationship groups in which additional jobseekers are most likely to be found.

Still another check of the 1930 unemployment figures shows that the proportion of unemployed family heads increased as the reported period of idleness lengthened (from 45.5 per cent among

persons out of work for 3 or 4 weeks, to 49.4 per cent among those unemployed more than 6 months). The theory that the unemployment of the usual family breadwinner may cause other members of his family to seek jobs offers an explanation of these differences. It was not that supplementary workers in families were discharged later than heads of families, but rather that some of the supplementary workers were forced into the labor market by the unemployment of the family head, and therefore had comparatively short periods of idleness immediately before the enumeration.

It seems likely that the returns of the 1930 census included not only usual gainful workers, but also 120,000 to 150,000 additional jobseekers (principally housewives).

Growth of Primary Unemployment and Number of Additional Workers (Special Unemployment Census, January 1931)

A much larger number of additional jobseekers was counted as unemployed by the special unemployment census in January 1931, discussed in Chapter XIV. A proportionally larger increase of unemployment was reported among women than among men, although the industries in which the heaviest layoffs had occurred since the 1930 census employed principally men. The increase of unemployment among women was concentrated in domestic and personal service—especially in private homes—and it is probable that many of the women registered as unemployed domestic servants were additional workers forced into the labor market by the depression.

The sex and age distribution of the unemployed workers counted in 1931 shows that while the increase in unemployment rates among men was distributed rather evenly in all age-classes, there was a marked increase in the number of unemployed women in the groups from 15 to 24 years and from 35 to 49 years of age. It seems probable that many of these women were seeking work because the usual family breadwinners had lost their jobs. The fact that the number of unemployed married women in the canvassed areas had increased 304.9 per cent, as against 196.7 per cent for single women and 155.2 per cent for widows and divorcees, supports this supposition.

It may be estimated that up to January 1931 the depression had forced into the labor market about 400,000 women who would not have been counted as gainful workers under other conditions. This figure, plus the number of male forced entrants and additional workers already on the labor market in 1930, brings the volume of secondary unemployment in January 1931 up to about 600,000 to 650,000.

Variations in the Number of Additional Workers in Consecutive Phases of the Depression (Philadelphia, 1931 to 1938)

The Philadelphia labor market statistics, analyzed in Chapter XV, were collected on a sample basis each year from 1931 to 1938 (except 1934), and reported the number of families with unemployment and the distribution of unemployment by size of family.

An analysis of these statistics suggests that the number of unemployed individuals was too large for the reported number of households with unemployment. It appears, therefore, that in families with some of their members unemployed there was an excess over the theoretically probable rate of unemployment, which may be interpreted as being the result of the entry of additional jobseekers into the labor market. The ratio of the number of additional jobseekers to that of unemployed usual workers would be approximately 1 to 4 or 1 to 5 from 1931 to 1933, and 1 to 6 or 1 to 7 in the later years.

A similar result is obtained from a comparison of the unemployment rates in one-worker families with the average rates for all families.

The most detailed statistics of the distribution of unemployment by size of family were computed in Philadelphia in 1938. At first they seem to support the thesis that the risk of unemployment by households was correlated with their size. This first impression, however, is not confirmed by closer analysis. As a checking experiment for the purposes of the present study, the theoretically probable distribution of families with 1 to 3 workers by employment status was computed on the assumption that the unemployment of usual breadwinners forced into the labor market a certain number of additional workers. It was found that the

estimated proportions of families completely employed, partly unemployed, and completely unemployed were extremely close to the numbers reported by the Philadelphia labor market studies.

Additional Workers by Type of Family in the Winter of 1935-36

Unemployment statistics collected in the winter of 1935-36 by the United States Public Health Service, and examined in Chapter XVI, provide direct proof of the presence of additional jobseekers in families in which the usual breadwinners are unemployed.

The survey showed that the number of gainful workers in families with any given number of adults was correlated with the employment status of the head. Most of the additional workers in families with unemployed heads were themselves unemployed when the enumeration was made, and this inflated the relative number of unemployed in these families. The Public Health Survey, however, did not count as unemployed housewives who were seeking work, so that the unemployment rate among married women was unduly low. The unemployment rate among family members other than spouses did not vary much by size of family, and it was about the same in families with employed or unemployable heads, but was much larger in families whose heads were unemployed.

In Detroit and Boston, 28 unemployed workers per 100 families were reported, but their number would be approximately 30 per 100 families if housewives seeking work had been counted. The ratio of additional workers (including wives) to usual earners out of jobs was probably 1 to 6.5 or slightly more.

It is estimated that about 8 per cent of the reported number of unemployed were additional workers, and that the reported number should be increased to approximately 14 per cent to take care of the underenumeration of unemployed married women.

Voluntary Registration of the Unemployed in November 1937

The Census of Partial Employment and Unemployment, taken in November 1937 and discussed in Chapter XVII, consisted of a

nation-wide voluntary registration of persons who wanted work (or more work), and an enumerative check census which was conducted two weeks later and covered about 1.5 per cent of the population of the United States. The voluntary registration returned a total of 7,845,016 unemployed, but as a result of the check census the Bureau of the Census estimated at 10,983,000 the number of fully unemployed persons in the country.

The excess of the returns of the check census over those of the voluntary registration in the same areas was not necessarily due to the incompleteness of the registration but is more likely to be accounted for by changes in business conditions and other factors between the two enumerations.

The voluntary registration reported the number of persons who wanted work and wanted it strongly enough to fill out the registration card. The reported total seems plausible in the light of the unemployment censuses of 1930, 1931, the National Health Survey of 1935-36, and the 1940 Census of Population, if what is known about the growth of the population, the changes in its structure, and variations in employment is taken into account, and if allowance is made for the probability of the forced entry of additional workers into the labor market. Likewise, the distribution of registrants by industry, sex, age, and number of other workers in the registrants' households is internally consistent.

In comparison with the unemployment enumerations taken in the early phases of the depression, the registration in November 1937 shows that unemployment was more evenly distributed by industries. The distribution of registrants by number of other family members suggests that about 900,000 to 1,000,000 additional jobseekers in families whose usual breadwinners were unemployed had registered as wanting work, which means a ratio of 1 additional jobseeker per 7 usual workers out of jobs and is consistent with other censuses.

Primary unemployment in November 1937 was probably about 6.9 million, including 2 million emergency workers. Since the normal turnover of labor requires a floating reserve of approximately 1.5 to 2 million unemployed, it seems that the deficit of jobs at the time of the voluntary registration hardly exceeded 5 to 5.5 million.

Among the almost 11 million unemployed reported by the check census were probably most of the voluntary registrants in the canvassed areas, plus other groups of workers, such as the normal turnover of labor between the two enumerations, persons laid off during this period because of seasonal influences or the business recession, additional jobseekers forced into the labor market by these layoffs, and persons who reported themselves as unemployed in advance of anticipated terminations of employment.

CHAPTER XI

METHODS OF MEASURING THE NUMBER OF ADDITIONAL WORKERS IN DEPRESSIONS

MOST OF THE SURVEYS of unemployment taken at different dates and in different areas reveal a striking discrepancy in the unemployment rates for households of different sizes. A preliminary report of the Philadelphia unemployment surveys stated in 1931 that "there is a distinct tendency for the percentage of unemployment and part-time employment to increase and the percentage of full-time employment to decrease as the family increases in size."¹ And in 1932 another Philadelphia report pointed out that "the probability of an employable becoming unemployed is greater in a large than in a small family."²

The fact that there are different unemployment rates for families of different sizes is well established, but the reasons for their existence have never been satisfactorily explained.

RISK OF UNEMPLOYMENT AND FAMILY STATUS OF WORKERS

Why should the sole worker in one household have a better chance of finding or keeping a job than the head of another family in which there are other earners? Since there can be no direct causal correlation between the number of workers in a family and their chance for employment, there must be some connection between the size of household and the personal characteristics of workers in this household—characteristics which are in turn related to the probability of their losing or finding employment. What are these characteristics?

The simplest answer would be that most of the supplementary earners in multi-worker families are young and untrained and therefore stand a greater risk of being fired and have smaller chances of being reemployed than family heads in one-worker households. This explanation, however, is not supported by available unemployment statistics.

¹ University of Pennsylvania, Industrial Research Department, *Special Report No. 1*, April 1931 (mimeo. revised), p. 4.

² *Special Report No. 6*, May 1932 (mimeo.), p. 4.

It is true that unemployment among young and old workers is heavier than in the middle age-classes, but there are many young and old persons living alone (one-person households), and the unemployment rate among them is likely to be at least as large as among supplementary family workers of the same age. Since unemployment surveys usually classify a person living alone as a main worker in a one-worker household, the disparity between the unemployment rates of supplementary workers and family heads cannot be as large as that between the unemployment rates in different age-classes.

On the other hand, the second earner in a family is frequently the housewife, and since the unemployment rate among women is usually lower than among men, it would be logical to assume that the average rate of unemployment in households where both the man and wife are gainful workers should be smaller than in one-worker families.

It is fairly probable that in many cases the training and experience of the family head are superior to those of the supplementary workers in the same household. But a skilled worker does not always have a better chance of employment than a semi-skilled or unskilled laborer. During a depression, a worker household in which the head is out of work and the children provide the living is not unusual. Besides, a pronounced concentration of unemployment by families has been found in periods when unemployment among skilled workers was more severe than among common laborers.³

Available statistics, therefore, fail to show why the risk of unemployment among supplementary workers should, as a rule, be higher than among family heads (including persons living alone). The risk may be higher in some cases, but in other cases it is likely to be smaller and it is impossible to find out which is the dominant tendency.

If the theory that unemployment rates are differentiated by the workers' family status and size of family is rejected, the alternative hypothesis is that unemployment is distributed among main breadwinners and supplementary workers at random. This assumption does not mean that all employed workers have equal chances of losing their jobs, or that all unemployed have equal

³ See Chapter XII, p. 147.

chances of finding work. It means only that there is no close correlation between the probability of losing a job and the family status of a worker or the number of other workers in his family.

This hypothesis has two merits: (1) it expresses adequately what is known and not known of the distribution of unemployment; and (2) it implies the possibility of analyzing the distribution of unemployment by families in terms of the theory of probability.

If additional workers and secondary unemployment exist in the labor market, then in comparison with other families of the same size, there must be more gainful workers, and specifically more unemployed workers, in families in which one or several members have lost their jobs. There remains the problem of developing methods for measuring this surplus in the labor supply.

The methods suggested in this study do not pretend to demonstrate the presence of additional workers in the labor market. They are based on the working hypothesis that primary unemployment is distributed more or less evenly over all families, and that the deviation of actual unemployment rates from this pattern is accounted for by secondary unemployment. The soundness of this hypothesis seems to be vindicated by the insight it provides into the structure of unemployment. In the following chapters, scores of unemployment censuses are analyzed and interpreted with the help of the suggested methods. The reader must decide whether the interpretation is plausible. If it is, this would mean that the working hypothesis it rests upon agrees with the available statistical information.

THE DATA AVAILABLE

The information available on the distribution of unemployment by families is fragmentary. Some of the most important and best known enumerations omitted any inquiry on the family status of unemployed workers.⁴ In other enumerations, family characteristics were reported only indirectly.⁵ Detailed information has been provided mainly by local enumerations.

⁴ This refers to the special census of unemployment taken in January 1931 and to the enumerative check census of November-December 1937.

⁵ This was the case in the 1930 Census of Unemployment. The voluntary registration carried out in November 1937 had only an indirect query on size of family.

The available statistics may be classified as follows :

- (a) Reports on the number and proportion of unemployed workers and of families with unemployed members ;
- (b) Reports on the distribution of the unemployed by family relationship and marital status ;
- (c) Reports on the number and proportion of the unemployed, with their distribution between one-worker and multi-worker families ;
- (d) Reports on the distribution of the unemployed by number of other workers in the same family ;
- (e) Reports on the distribution of full and partial employment and unemployment, by size of family (measured by the number of gainful workers).

Since it is impossible to interpret all these reports with one standard method, several procedures have been developed to fit the individual series.

ESTIMATING THE PROBABLE PROPORTION OF ADDITIONAL JOBSEEKERS FROM THE VISIBLE CONCENTRATION OF UNEMPLOYMENT IN FAMILIES

The simplest form of unemployment statistics with reference to families is that mentioned under (a). The census enumerates the households in a specified area and returns the number of earners (or gainful workers), the number unemployed among them, and the number of households in which one or more individuals are out of jobs. The extent and distribution of unemployment in the canvassed area are characterized by three rates :

Proportion of unemployed among earners.....	q
Proportion of families with unemployment....	Q
Number of earners per family.....	m

The three items are related to each other.

If there were only one worker in each family, (Q) would be equal to (q), but for a multi-worker family, the probability of having one or several earners out of jobs is necessarily larger than (q). And as there are one-worker and multi-worker households in every area, the proportion of families with unemployment (Q) must be larger than (q). It is higher the larger the number of workers per household (m), but can never reach the limit of (m) times (q).

If the values of (q) and (m) are known, (Q) may be tentatively determined on the assumption that the proportion of unemployed workers is the same in households of all sizes. This "theoretical probability" of the occurrence of unemployment (Q') will be determined by the laws of probability, in agreement with the distribution of households by number of gainful workers in the surveyed area. Experience shows that in spite of the great diversity in family composition in different areas, the value of (Q') for each specified unemployment rate (q) is very closely correlated with the number of workers per family (m).⁶ Therefore, the "theoretical probability" of unemployment in worker families may be presented as a linear function of (m),

$$Q' = A + Bm \dots \dots \dots (1)$$

where (A) and (B) are coefficients independent of (m) which vary with the unemployment rate (q). Experimenting with the distribution of gainful workers by size of family in urban areas in 48 states and the District of Columbia in 1930, it is found that the theoretical probability of unemployment in a family for different (q) and (m) may be expressed by the following formulas :

(q)	Q'_m as a function of (m), for the specified (q), in per cent	
5 per cent.	0.2 + (4.8 × m)	}
10 per cent.	1.3 + (8.7 × m)	
15 per cent.	3.0 + (12.0 × m)	
20 per cent.	5.3 + (14.7 × m)	
25 per cent.	8.2 + (16.8 × m)	
30 per cent.	11.3 + (18.7 × m)	

The values of (A) and (B) as shown in equations (2) may be plotted on a chart and interpolated by the freehand method so that a continuous series of (A) and (B) for any value of (q) may be established. In Appendix Table VI-A, the respective values of the theoretical probability (Q') are shown for (m) ranging from 1.3 to 1.9 and for (q) varying from 5 to 30 per cent.⁷

Read vertically, this table shows how large the proportion of families with unemployment would be for the specified values of

⁶ See Appendix Note 1, "Theoretically Probable Proportion of Workers' Families with Unemployment as a Function of the Unemployment Rate Among Workers and Number of Workers per Family."

⁷ For intermediary values of (m) and (q), the numbers shown in Appendix Table VI-A may be interpolated in the usual way.

(m) and (q), if the individual risk of unemployment were independent of the size of household. This is likewise shown on Diagram XVI along its vertical ordinates. For convenience this chart may be transformed to show the theoretically probable unemployment rate (q') which corresponds to the specified proportion of families with unemployment (Q) and the specified number of gainful workers per family (m).

(See Diagram XVII and Appendix Table VI-B.)

When dealing with unemployment statistics of the described type, first the empirical values (m), (q), and (Q) should be established. Then the empirical unemployment rate (q) is compared with the theoretical value (q') which corresponds to the given percentage of families with unemployed members (Q) and the given number of workers per family (m). It will always be found that (q) is larger than (q'), and the disparity between the two values will evidence the concentration of unemployment in the same families. On the hypothesis that this concentration is due to the forced entry of new jobseekers in the respective families, the proportion of additional workers in the labor market may be determined from the formula

$$\Delta = q - q' \dots \dots \dots (3)$$

ESTIMATING THE PROBABLE PROPORTION OF ADDITIONAL
WORKERS FROM THE VISIBLE DIFFERENCE BETWEEN
UNEMPLOYMENT RATES IN ONE-WORKER AND
MULTI-WORKER HOUSEHOLDS

Suppose that in the canvassed area there are (N) usual earners, and among them (N_1) are in one-worker families while the rest are in multi-worker households. Suppose further that part of the earners are out of work, the average unemployment rate being (r) for all families, so that there is a total of (Nr) usual earners out of work, and among them (N_1r) are in one-worker households.

Suppose also that, because of the unemployment of usual earners, additional workers enter the labor market, the ratio of their number to that of unemployed usual workers being (s). Then the total number of additional workers will be (Nrs) and among them (N_1rs) will come from former one-worker families.

DIAGRAM XVI

THEORETICALLY PROBABLE PROPORTION OF WORKERS' FAMILIES WITH UNEMPLOYMENT (Q') AS A FUNCTION OF THE UNEMPLOYMENT RATE AMONG WORKERS (q) AND THE NUMBER OF WORKERS PER FAMILY (m)

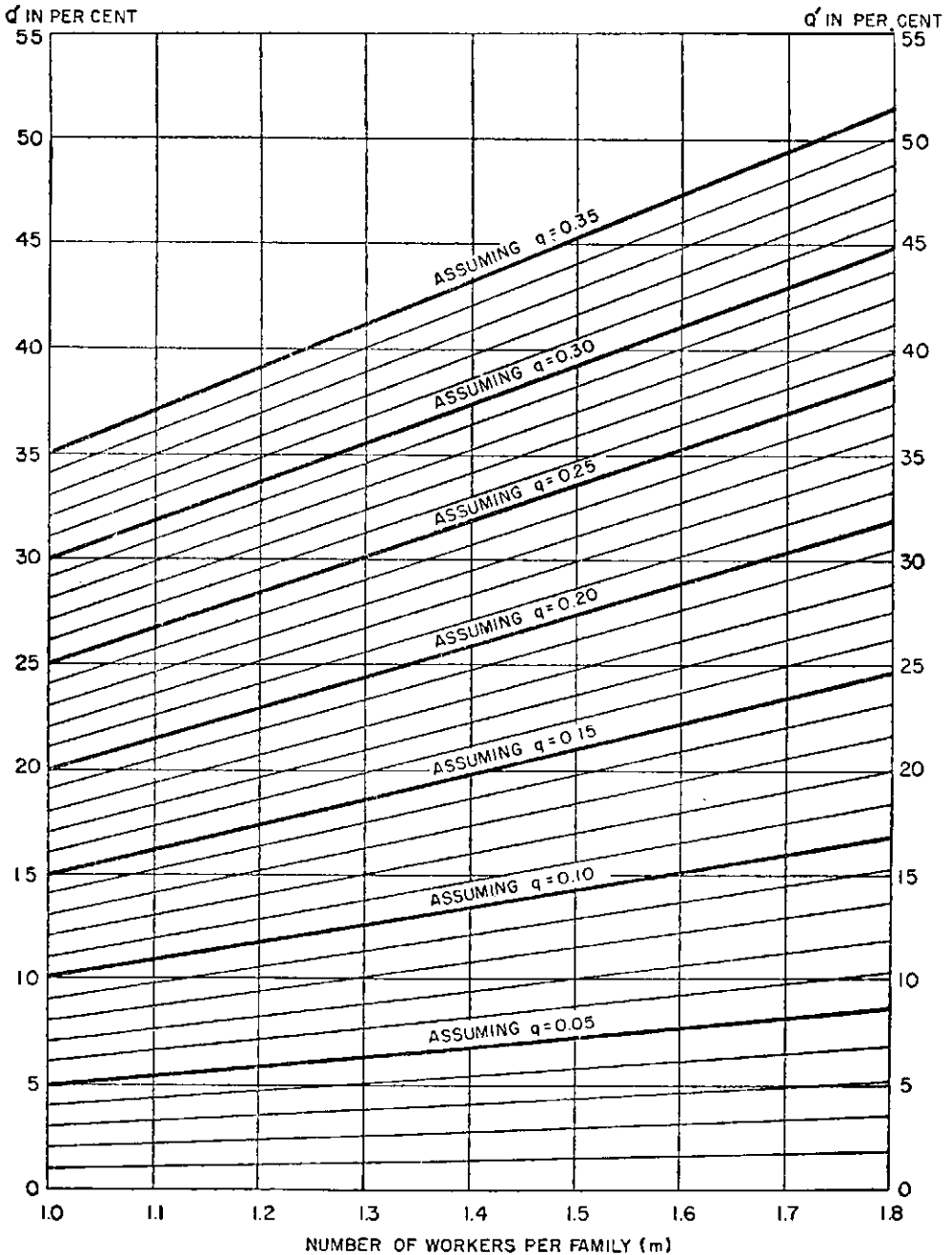
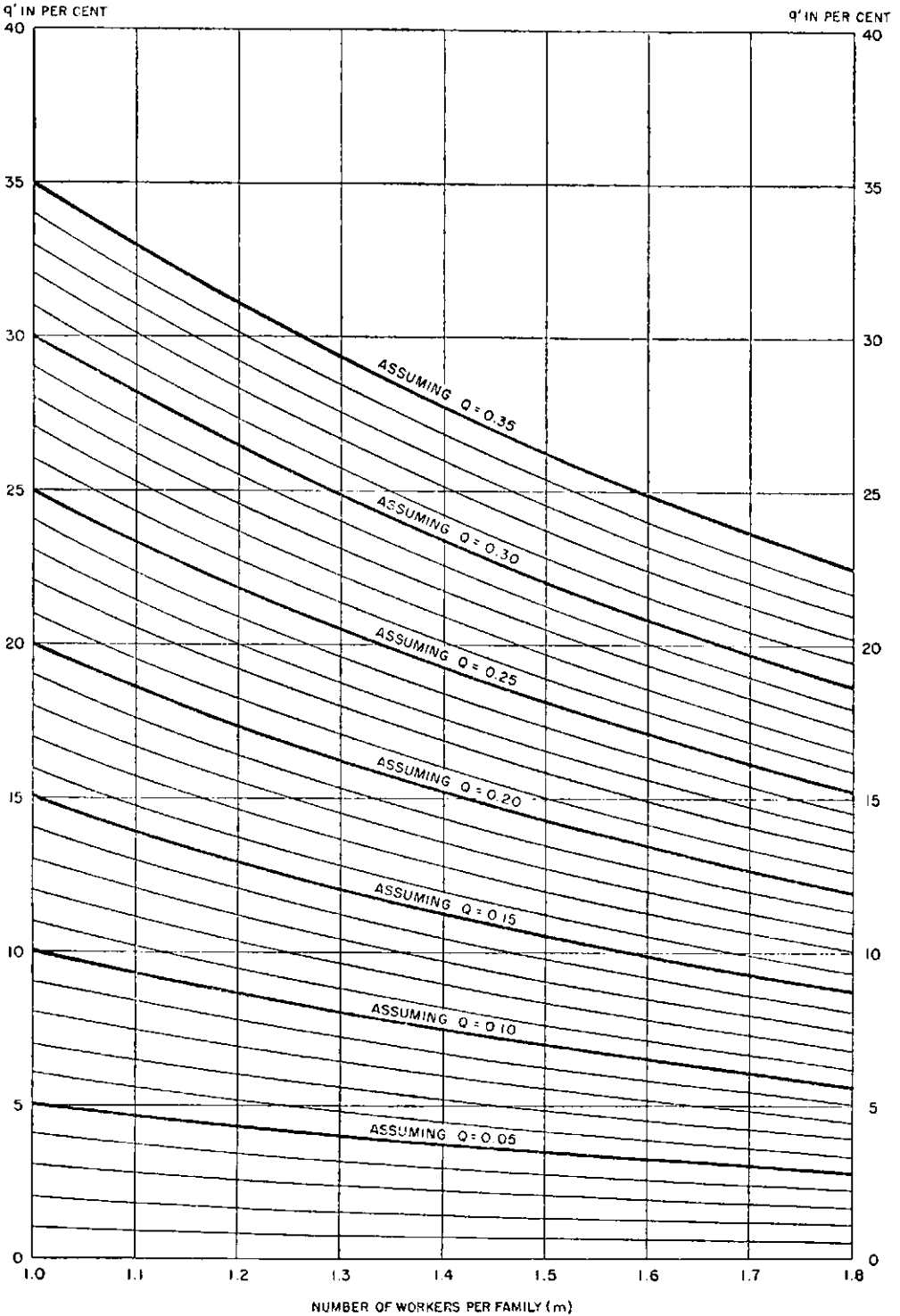


DIAGRAM XVII

THEORETICALLY PROBABLE UNEMPLOYMENT RATE (q') AS A FUNCTION OF THE PROPORTION OF FAMILIES WITH UNEMPLOYMENT (Q) AND THE NUMBER OF WORKERS PER FAMILY (m)



The entry of additional workers will increase the total number of workers in the canvassed area to $N(1+rs)$ and the number of unemployed to $N(r+rs)$, so that the actual unemployment rate will no longer be (r) but $\frac{r+rs}{1+rs} = r \cdot \frac{1+s}{1+rs}$ which always is larger than (r) .

Since households with a jobseeker in addition to the usual breadwinner are no longer one-worker households, (N_1rs) families should be excluded from this group. The actual number of one-worker families will then be $N_1(1-rs)$ and the number of unemployed in these families will be $N_1(r-rs)$. This brings the visible unemployment rate in one-worker families to $\frac{r-rs}{1-rs} = r \cdot \frac{1-s}{1-rs}$ which necessarily is smaller than (r) .

Thus if (r) is the rate of unemployment among usual workers, and (s) is the rate of entry of additional workers, the visible rates of unemployment must be:

for all workers $A = r \cdot \frac{1+s}{1+rs} \dots\dots\dots (4)$

for one-worker families $B = r \cdot \frac{1-s}{1-rs} \dots\dots\dots (5)$

Equations (4) and (5) are solved for (r) and (s) , and thus the supposed unemployment rate for usual workers and the ratio of additional workers to unemployed usual earners are expressed as functions of the unemployment rates among all workers and among those in one-worker families. It is found that:

$$r = \frac{A+B-2AB}{2-A-B} \dots\dots\dots (6)$$

$$s = \frac{A-B}{A+B-2AB} \dots\dots\dots (7)$$

Since (s) is the ratio of the number of additional workers to that of unemployed usual workers, the proportion of additional workers to all usual workers is

$$rs = \frac{A-B}{2-A-B} \dots\dots\dots (8)$$

The volume of primary and of secondary unemployment (R) and (S), in terms of the total labor force $N(1+rs)$, are expressed by the formulas :

$$R = \frac{Nr}{N(1+rs)} = \frac{A+B-2AB}{2-2B} \dots\dots\dots (9)$$

$$S = \frac{Nrs}{N(1+rs)} = \frac{A-B}{2-2B} \dots\dots\dots (10)$$

If (A) and (B) are reported by a census, the rates (r), (s), (R) and (S) may be calculated from formulas (6), (7), (9) and (10), as in the following example.

A sample census of employment and unemployment in Philadelphia in the summer of 1936 reported that 30.1 per cent of all employable persons in canvassed families were out of work (A), while in one-worker households the proportion of unemployed was 23.7 per cent (B). Applying formulas (6) and (7), it is found that the rate of unemployment for usual workers (r) amounted to 0.2704 or approximately 27 per cent, the proportion of additional workers to unemployed usual earners (s) was 0.1619 or 16.2 per cent, in round numbers, and (rs) equalled 0.04378. Then, using formulas (9) and (10), the actual unemployment rate ($\Lambda=30.1$ per cent) is segregated as follows :

$$R = \frac{r}{1+rs} = 0.25906 = \text{about 25.9 per cent}$$

$$S = \frac{rs}{1+rs} = 0.04194 = \text{about 4.2 per cent}$$

ESTIMATING THE PROBABLE DISTRIBUTION OF UNEMPLOYMENT BY FAMILIES WITH DIFFERENT NUMBERS OF WORKERS

The formulas given above make it possible to estimate the probable distribution of primary and secondary unemployment by families of different size. They explain also the origin of the differentiated unemployment rates. The procedure is illustrated by the following example.

The special trial census taken in South Bend, Indiana, August

6-12, 1939, reported the following distribution of unemployment by families with different numbers of workers:⁸

Families with	Number of families	Number of workers	Seeking work or on work relief	
			Number	Per cent
1 worker	14,492	14,492	1,787	12.3
2 workers	7,010	14,020	2,091	14.9
3 workers	2,316	6,948	1,424	20.5
4 or more.....	1,363	5,620	1,491	26.5
Total	25,181	41,080	6,793	16.5

In this tabulation 16.5 per cent (or 0.165) is the actual unemployment rate for all families, i.e., (A) in the preceding section, while 12.3 per cent (or 0.123) is the unemployment rate for one-worker families, i.e., (B).

Replacing (A) and (B) in formulas (6) and (7) by their reported values, the unemployment rate among usual workers and the proportion of additional jobseekers to the number of unemployed usual earners, are found:

$$r=14.45 \text{ per cent}$$

$$s=16.98 \text{ per cent}$$

This suggests that the proportion of additional jobseekers to all usual earners was $rs=2.454$ per cent, and affords a basis for an explanation of the reason for differentiated unemployment rates by number of workers in the family.

The reported number of one-worker families (14,492) is the number of families which remained in this group after those with one usual earner and one additional jobseeker had been transferred into the group of two-worker households. Assuming an equal proportion of additional workers in all family groups, it is found that, without the entry of additional workers, the number of one-worker families is likely to have been 14,857 ($14,492 \div 0.97546$).

The reported number of two-worker families (7,010) would include 365 ($14,857 - 14,492$) former one-worker families, but would not include the former two-worker families who would be transferred into the group of three-worker families because of the entry of additional workers. Assuming as before an even distribution of primary unemployment, it appears that in approximately 25 per cent of the former two-worker families, 1 out of 2 usual

⁸ Release of the Bureau of the Census, November 7, 1940, pp. 4-5.

earners was out of work, and in 2 per cent of these families both usual earners were unemployed. Assuming further that in no family was there more than one additional jobseeker and that the entry of new workers was particularly heavy in the completely unemployed families, it is found that additional workers were probably in 343 families with 2 usual earners.

Continuing this reasoning, it is likely that the reported number of three-worker families (2,316) included the 343 former two-worker families, but did not include 157 families with three usual earners and an additional jobseeker.

To sum up, it is probable that, without the entry of additional jobseekers, the canvassed families would be distributed by number of usual earners as follows:

Families with	Number of families	Number of usual earners
1 usual earner.....	(14,492+365) = 14,857	14,857
2 usual earners.....	(7,010-365+343) = 6,988	13,976
3 " "	(2,316-343+157) = 2,130	6,390
4 or more "	(1,363-157) = 1,206	4,898
Total	25,181	40,121

From this tabulation the probable visible distribution of unemployment resulting from an even distribution of primary unemployment in all family groups and an even rate of entry of additional jobseekers, may be ascertained.⁹

⁹ For this purpose the reasoning presented in the text should be followed backwards. In the 14,857 one-worker families, 14.45 per cent of the usual workers (2,145 persons) lost their jobs. Consequently 365 additional jobseekers entered the labor market, 365 families ceased to be one-worker households, and there remained in this group 14,492 one-worker families with 1,780 persons out of work (2,145 - 365), an unemployment rate of 12.3 per cent.

In the 6,988 two-worker families, 2,020 usual earners lost their jobs, and 343 additional jobseekers entered the labor market. With the 365 families which included one usual earner and one additional worker, there were 7,010 two-worker families. Assuming that there were two unemployed individuals in each of the former one-worker families and 550 unemployed usual earners in the 343 former two-worker families with additional jobseekers, the total unemployment in this group of families might amount to 2,200 in round numbers, which would mean an unemployment rate of 15.7 per cent (2,200÷14,020).

In the 2,130 three-worker families, 228 individuals lost their jobs and 157 additional workers entered the labor market. Approximately 893 (550+343) unemployed individuals might be in the former two-worker families, and it is likely that about 400 usual workers were unemployed in the 157 former three-worker families with additional workers. This would bring to 1,421 the number of unemployed individuals in three-worker families, an unemployment rate of 20.5 per cent (1,421÷6,948).

In families with four or more usual workers, 703 would have lost their jobs,

The computation results in the following rates of visible unemployment:

In families with 1 worker.....	12.3 per cent
In families with 2 workers.....	15.7 per cent
In families with 3 workers.....	20.5 per cent
In families with 4 or more workers.....	24.6 per cent

These rates are very close to those returned by the census.

ESTIMATING THE PROBABILITY OF COMPLETE AND PARTIAL UNEMPLOYMENT IN FAMILIES WITH DIFFERENT NUMBERS OF WORKERS

Detailed statistics of the distribution of unemployment by families with different numbers of workers are very scarce, but on several occasions unemployment censuses have made a distinction between families of different size that are completely employed, partly unemployed and completely unemployed. A family is classified as "partly unemployed" when it has at least one breadwinner at work (on a full-time or part-time basis) and at least one out of a job. On a few occasions tabulations of the unemployed with reference to the number of "other workers" in their families were prepared. These tabulations provide an insight into the distribution of unemployment.

Suppose that there are in the canvassed area (F_1) families with one worker, (F_2) with 2, (F_3) with 3, etc., and that among all workers the unemployment rate is (r). Then the number of completely unemployed and completely employed families in each group will be as follows:

Families with	Total	Number of families	
		Completely unemployed	Completely employed
1 worker	F_1	$F_1 \cdot r$	$F_1(1-r)$
2 workers	F_2	$F_2 \cdot r^2$	$F_2(1-r)^2$
3 "	F_3	$F_3 \cdot r^3$	$F_3(1-r)^3$
etc.			

The number of partly unemployed families in each group will be determined as the balance between the total number of households

120 would have entered the labor market, and 557 (400+157) would belong to the former three-worker families. The number of unemployed in this group of families would be 1,380 and the rate of unemployment would be 24.6 per cent (1,380÷5,620).

in the group and the numbers of families completely unemployed and completely employed.

If these theoretical rates are compared with those returned by a census, it appears that the empirical rates of complete employment and complete unemployment, in all size-classes of families, are much higher, and those of partial unemployment considerably lower, than in the theoretical pattern. In other words, there is a concentration of employment in certain families and a concentration of unemployment in others.

This cannot be explained in terms of different unemployment rates for family heads and supplementary workers, since striking differentials are found also in the unemployment rates for "third" earners classified by the employment status of the first two breadwinners, in the unemployment of "fourth" earners classified by the employment status of the first three, etc.¹⁰

Suppose that the proportions of completely unemployed families with 1, 2, 3 workers, etc., are (U_1) , (U_2) , (U_3) , etc. and that the proportions of completely employed families of the same size are (E_1) , (E_2) , (E_3) , etc.

According to the theory of differentiated unemployment rates, it would be expected that the unemployment rate for the "first" workers (heads of families) would be about the same in all family groups, and as this is (U_1) in one-worker households, it ought to be near this rate in other families also. Then the unemployment rate among "second" workers in two-worker families would be $(U_2 \div U_1)$; similarly, the rate among "third" workers in three-worker households would be $(U_3 \div U_2)$. On the other hand, the probability of employment for "second" workers may be determined as the ratio $(E_2 \div E_1)$, that of "third" workers as $(E_3 \div E_2)$, and so on. In this way two series of employment rates are computed:

Theoretical employment rates of second, third, and fourth workers, in families		
	With preceding workers employed	With preceding workers unemployed
Second workers	$E_2 \div E_1$	$1 - (U_2 \div U_1)$
Third workers	$E_3 \div E_2$	$1 - (U_3 \div U_2)$
Fourth workers	$E_4 \div E_3$	$1 - (U_4 \div U_3)$

¹⁰ See Appendix Note 2, "Differentiated Rates of Unemployment for 'First,' 'Second' and Other Workers in Families."

Available statistics show that the employment rates computed in the first column are always considerably larger than those in the second set. For example, the third worker has a fairly good chance of being employed if the first two earners in the family are at work, but he will very likely be out of a job if the first two earners are unemployed. This inequality of risks allows two explanations: either the risk of unemployment for each family member varies with the employment status of other members; or the number of workers in the family may increase as a result of the unemployment of its usual breadwinners. If the second explanation is accepted, it is easy to visualize what happens in families of different sizes during a depression.

Suppose, for example, that in an area with 100,000 families, 70,000 have one worker each, 25,000 have two workers and 5,000 have three, so that the total number of workers is 135,000 ($m=1.35$). Suppose that in all families 20 per cent of the workers have lost their jobs, and that in 1 case out of 5 the unemployment of the usual breadwinner has forced another family member to look for work.

In the group of one-worker families, the sole earner in 14,000 households will be unemployed, and in 2,800 cases this will force additional workers into the labor market. Since these 2,800 families will no longer belong to the group of one-worker households, there remain in this group:

Families	(70,000— 2,800)=67,200
Among them: Employed	(70,000—14,000)=56,000
Unemployed	(14,000— 2,800)=11,200
Proportion: Employed	(56,000÷67,200)=83.33 per cent
Unemployed	(11,200÷67,200)=16.67 per cent

As the unemployment rate for individual workers (r) is 20 per cent, the probability of both workers in a two-worker family being unemployed is 4 per cent (r^2), while the probability of both of them being employed is 64 per cent $(1-r)^2$. Therefore, among the 25,000 two-worker families, 1,000 will be completely unemployed, 16,000 completely employed, and 8,000 partly unemployed. According to the assumption of 50,000 usual workers in these families, 10,000 will be unemployed and their unemployment will bring 2,000 additional jobseekers into the labor market. If they were distributed in direct proportion to the number of unem-

ployed usual earners, there would be 400 additional workers in completely unemployed families and 1,600 in partly unemployed households. This distribution, however, is not very realistic, since it is fairly certain that the proportion of additional jobseekers in completely unemployed families must be particularly large. It would be preferable to assume that about 800 additional workers will enter the labor market from the completely unemployed former two-worker families and 1,200 from partly unemployed households. After the transfer of all former two-worker households with additional workers into the three-worker class of families, there will remain in the two-worker family group:

Families	$(25,000 + 2,800 - 2,000)$	$= 25,800$
Among them: Completely employed..		$= 16,000$
Completely unemployed (1,000 + 2,800 ¹¹ - 800)		$= 3,000$
Partly unemployed ... (8,000 - 1,200)		$= 6,800$
Proportion: Completely employed..	$(16,000 \div 25,800)$	$= 62.02$ per cent
Completely unemployed (3,000 \div 25,800)		$= 11.63$ per cent
Partly unemployed ... (6,800 \div 25,800)		$= 26.35$ per cent

Among the 5,000 three-worker families which include 15,000 usual workers, 2,560 ($5,000 \times 0.8^3$) will be completely employed, while 40 families ($5,000 \times 0.2^3$) will be completely unemployed. There will be added to them 2,000 former two-worker households, 800 supposedly completely unemployed and 1,200 partly unemployed. The number of additional workers in the former three-worker families will amount to 600 (20 per cent of 3,000, which is the number of unemployed usual workers in this group of households). Assuming that there is only one additional jobseeker per family and that there will be an entry of one jobseeker in all completely unemployed former three-worker households, the following distribution of three-worker families is found:

Families	$(5,000 + 2,000 - 600)$	$= 6,400$
Among them: Completely employed		$= 2,560$
Completely unemployed .. (40 + 800 ¹² - 40)		$= 800$
Partly unemployed (2,400 + 1,200 - 560)		$= 3,040$
Proportion: Completely employed	$(2,560 \div 6,400)$	$= 40.00$ per cent
Completely unemployed .. (800 \div 6,400)		$= 12.50$ per cent
Partly unemployed (3,040 \div 6,400)		$= 47.50$ per cent

¹¹ It is assumed that all additional jobseekers from former one-worker families are unemployed.

¹² It is assumed that all additional jobseekers from former two-worker families are unemployed.

To sum up, the following percentage distribution of families by employment status is found:

Employment status of family	Families with the specified number of usual earners ¹³			Families with the specified total number of earners ¹⁴		
	1	2	3	1	2	3
	Total	100.00	100.00	100.00	100.00	100.00
Completely employed	80.00	64.00	51.20	83.33	62.02	40.00
Partly unemployed	—	32.00	48.00	—	26.35	47.50
Completely unemployed ..	20.00	4.00	0.80	16.67	11.63	12.50

Still more impressive are the differentiated unemployment rates by the order of workers in the households. If 16.67 per cent (U_1) is the probability of unemployment, and 83.33 per cent (E_1) is the probability of employment of "first" workers, the visible unemployment rate of "second" workers will be:

$$\text{If the first worker is unemployed..... } \frac{(U_2=11.63)}{(U_1=16.67)} = 69.77 \text{ per cent}$$

$$\text{If the first worker is employed..... } 1 - \frac{E_2}{E_1} = 1 - \frac{62.02}{83.33} = 25.53 \text{ per cent}$$

For "third" workers, the unemployment rates will be:

$$\text{If the first two workers are unemployed.. } \frac{(U_3=12.50)}{(U_2=11.63)} = \text{over 100 per cent}$$

$$\text{If the first two workers are employed... } 1 - \frac{E_3}{E_2} = 1 - \frac{40.00}{62.02} = 39.12 \text{ per cent}$$

If this reasoning is followed in reverse, the visible irregularity in the distribution of unemployment by size of family may be used to determine the entry of additional workers from families of different sizes. First, the probable rates of primary and secondary unemployment—(r) and (s)—are established by comparing the returned unemployment rates in one-worker households and in all families.¹⁵ Further, the distribution of families as it would be without the entry of additional workers is determined.¹⁶ After this adjustment, the distribution of unemployment resulting from the given unemployment rates and shifts of inflated families into the next higher size-class is calculated.¹⁷ Then the probable

¹³ With no allowance for additional jobseekers in partly or completely unemployed families.

¹⁴ Allowing for additional workers in families with usual earners out of work.

¹⁵ See formulas (6) and (7) on page 134.

¹⁶ See page 137.

¹⁷ See page 138.

proportion of completely employed and completely unemployed families with the specified number of workers is established. It is not necessary for the theoretically probable rates to fit exactly those reported by the enumeration. The point is rather to show that the actual distribution could result from an approximately even distribution of primary and secondary unemployment in families with different numbers of workers.

CHAPTER XII

CONCENTRATION OF UNEMPLOYMENT BY FAMILIES IN 1915

UNEMPLOYMENT STATISTICS for the 1930's contain but fragmentary information on the distribution of the unemployed by families. The most inclusive censuses of unemployment (April 1, 1930, January 1931 and November 1937), did not report the number of families with unemployed members. On the other hand, the family statistics provided by local unemployment enumerations taken during the depression are not very conclusive since the living arrangements of the unemployed workers might have been influenced by variations in the relief policies in the respective cities. Enumerations of unemployment by families taken when there was no extensive unemployment relief program therefore deserve particular attention. The most comprehensive and instructive are those carried out at the beginning of the first World War.

UNEMPLOYMENT ENUMERATIONS IN 1915

The 1915 depression came suddenly and was rather severe in its early phase. As no one at that time could foresee that the slack period would be followed almost immediately by a strong upswing in business, the brevity of the depression did not allay its effects on the structure of worker families. Rather, because this depression was brief and the enumerations were taken shortly after it began, they should provide a particularly clear picture of the forced entries of additional workers from families with unemployed usual earners. In fact, if the usual breadwinner is laid off in an early phase of a depression, there is more hope of finding jobs for members of his family, and therefore more probability of their searching for work, than after years of disappointing experience all around them.

Data on the distribution of the unemployed by families, provided by the 30 local enumerations carried out between February

and November 1915¹ are summarized in Appendix Table VII and discussed in the following pages.

UNEMPLOYMENT RATE AND THE PROPORTION OF FAMILIES WITH UNEMPLOYMENT

As Table VII shows, the unemployment rates among workers in the canvassed cities varied widely, from 4.3 per cent in Bridgeport, Connecticut, and 4.5 per cent in Ogden, Utah, to 20.0 per cent in Portland, Oregon, and 20.3 per cent in Duluth, Minnesota. The range of variation in the proportion of families with unemployment was as wide (from 5.7 per cent in Ogden and 6.1 per cent in Bridgeport to 23.4 per cent in Portland and 24.7 per cent in Duluth). There was a very close correlation between the proportion of families with unemployment (Q) and the rate of unemployment among workers (q) by cities.

(See Diagram XVIII.)

In all 30 of the enumerations, (Q) was larger than (q), but was smaller than (q) multiplied by the number of workers per family (m). Roughly, (Q) fell somewhere between (q) and 1.5 times (q). It is found also that the reported proportion of families with unemployment (Q) in all cases was appreciably smaller than the theoretically probable proportion (Q'), which may be determined from Diagram XVI or Appendix Table VI-A for the given unemployment rate (q) and the average size of family (m) in each city.

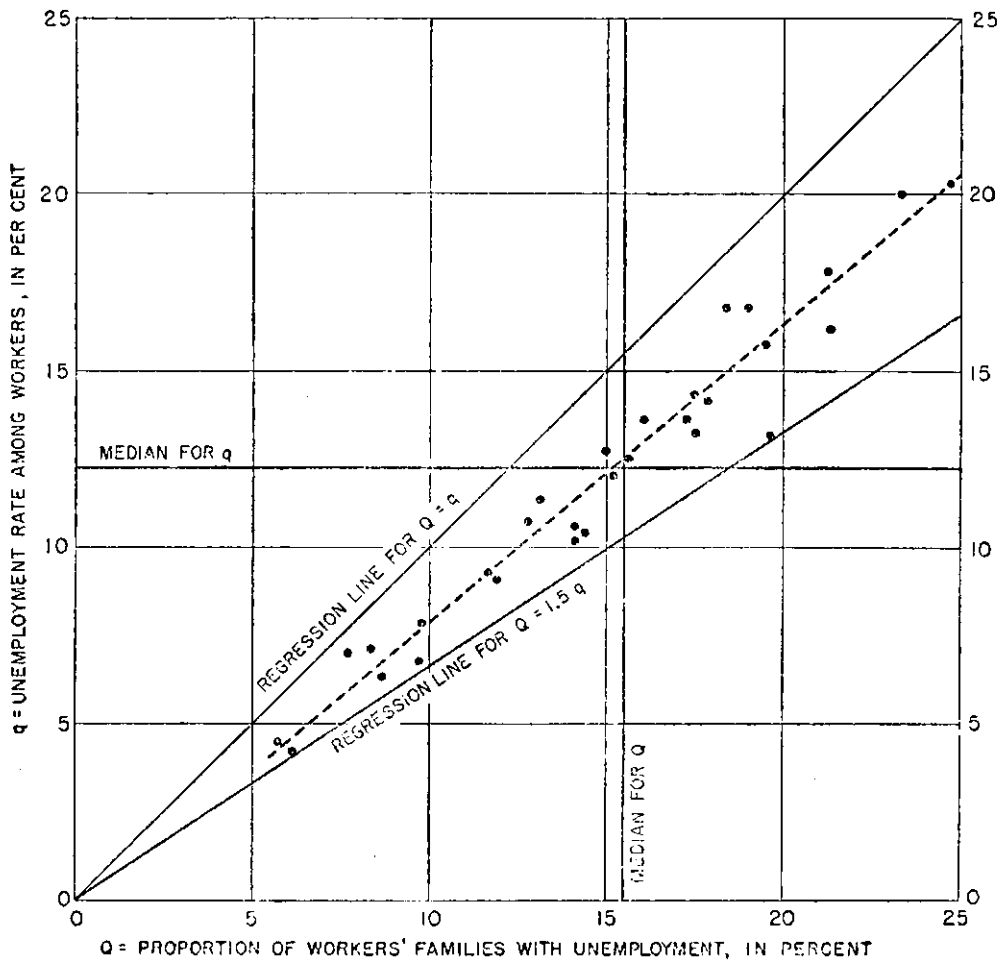
In other words, the unemployment rate (q) in all the enumerations was larger than it should have been theoretically in order to fit the returned proportion of families with unemployment, in agreement with the pattern of Diagram XVII and Appendix Table VI-B. The magnitude of the disparity between the empirical unemployment rates (q) and the theoretical rates (q') which correspond to the returned values of (Q) and (m), is shown in the last column of Appendix Table VII.

¹ United States Bureau of Labor Statistics, *Unemployment in the United States*, Bulletin No. 195, July 1916. For further details, see Chapter VIII.

DIAGRAM XVIII

CORRELATION BETWEEN THE PROPORTION OF WORKERS' FAMILIES WITH UNEMPLOYMENT (Q) AND THE UNEMPLOYMENT RATE AMONG WORKERS (q) IN THE UNITED STATES, 1915

(Each dot represents one of the 30 censuses)



CONCENTRATION OF UNEMPLOYMENT, OR ADDITIONAL JOB-SEEKERS IN FAMILIES WITH UNEMPLOYED USUAL EARNERS

In analyzing the 1915 statistics of unemployment, it should first be made clear that the concentration of unemployment which they suggest is not a concentration of cases of unemployment in large families. In fact the censuses give no information on the size of households with and without unemployment. They show only that the cases of unemployment were concentrated in a

smaller number of households than would be expected according to the laws of probability, so that if one family member was unemployed there was a relatively high probability of finding a second jobseeker in the same household. This characteristic of concentration is of great importance.

Suppose that in an area there are (N) families with a total of (Nm) workers; that the unemployment rate among them is (q); and that in no family is more than one individual out of a job. The number of families with unemployment will be equal to that of unemployed individuals (qNm), and the proportion of families with unemployment (Q) will equal (qm), independent of whether unemployment occurs in large or small families or is distributed at random in households of all sizes. On the other hand, if there are two unemployed persons in a family or none, the proportion of families with unemployment will be ($\frac{1}{2}$ qm), independent of the size of the families in which unemployment occurs.

The concentration of unemployment reported by the 1915 censuses cannot be explained by the disparity between the unemployment rates among the principal and the supplementary workers in the canvassed families. As pointed out in Chapter XI, to a large degree the supplementary earners are women, and the 1915 enumerations show that unemployment among female workers at that time was not as heavy as among men.² On the other hand, unemployment in 1915 was concentrated in highly skilled occupations, such as bricklayers, plumbers, marble and stone cutters, chauffeurs, and machinists,³ and it is highly probable that persons

² The following unemployment rates among male and female wage earners were reported (in per cent) :

	Male	Female
Boston	11.4	7.3
Chicago	14.3	10.0
Philadelphia	11.5	7.2
Pittsburgh	12.5	6.2
St. Louis	14.4	12.1
New York (February).....	18.8	9.2
New York (September).....	7.1	5.5
Unweighted average	12.9	8.2

Source: U. S. Bureau of Labor Statistics, *Unemployment in the United States*, Bulletin No. 195, July 1916, pp. 9, 99.

³ *Ibid.*, pp. 44-46.

engaged in these occupations were family heads rather than supplementary earners in multi-worker families. Unskilled and casual laborers, among whom supplementary earners prevail, were not affected by unemployment of equal severity.

The disparity between the reported and the theoretically probable proportion of families with unemployment in the 1915 enumerations may be explained satisfactorily on the assumption that primary unemployment was distributed more or less evenly among workers in all households and that this resulted in the entry of additional jobseekers from families with unemployed usual earners.⁴

PROBABLE PROPORTION OF ADDITIONAL WORKERS AMONG THE UNEMPLOYED

Assuming that the additional workers forced into the labor market were all in the process of seeking jobs when the enumerations were taken, their percentage among the usual gainful workers would be equal to the excess of (q) over (q'). In per cent of primary unemployment, it would equal the ratio of the excess of (q) over (q') to (q'), i.e., $100 \left(\frac{q}{q'} - 1 \right)$, as shown in the tabulation on the opposite page.

It appears that in half of all cases the estimated proportion of additional workers in families with the usual breadwinners out of jobs ranged from 10 to 20 per cent. It was larger in early spring than in summer, the unweighted average being 16.5 per cent for the East and Middle West cities canvassed in March and April 1915, and 9.6 per cent for the Rocky Mountain and Pacific Coast cities surveyed in June and July.⁵

The proportion of additional workers among all gainful workers in the canvassed areas would range from 0.3 to 0.5 per cent

⁴ It should be kept in mind that the assumption of an even distribution of unemployment in all households means only that the average unemployment rates were about the same in one-worker and multi-worker families, and does not exclude the probability of different unemployment rates by race, sex, age, skill, occupation, industry and the like.

⁵ This difference might be accounted for also by local conditions.

in small cities with low unemployment rates, and exceed 2.0 per cent in cities with particularly heavy unemployment (such as Duluth, Minneapolis, St. Paul, St. Louis, and particularly New York in February 1915).⁶

Estimated proportion of additional workers in families with primary unemployment, 1915

City	In per cent of gainful workers ($q - q'$)	In per cent of primary unemployment $100\left(\frac{q}{q'} - 1\right)$
New York, February.....	2.9	21.8
New York, September.....	1.0	17.5
<i>March-April</i>		
Boston, Massachusetts	1.3	14.6
Bridgeport, Conn.	0.3	7.5
Chicago, Illinois	1.9	16.7
Cleveland, Ohio	1.2	14.6
Duluth, Minnesota	2.4	13.4
Kansas City, Missouri.....	1.6	14.7
Louisville, Kentucky	1.5	12.9
Milwaukee, Wisconsin	1.4	21.5
Minneapolis, Minn.	2.5	21.0
Philadelphia, Pa.	1.8	21.2
Pittsburgh, Pa.	1.4	14.4
St. Louis, Missouri.....	2.1	18.3
St. Paul, Minnesota.....	2.6	22.6
Springfield, Missouri	1.0	16.4
Toledo, Ohio	1.3	13.8
Wilkes-Barre, Pa.	1.1	20.8
<i>June-July</i>		
Butte, Montana	0.5	7.7
Los Angeles, Calif.....	0.9	8.6
Oakland, California	1.5	14.3
Ogden, Utah	0.7	18.4
Portland, Oregon	1.1	5.8
Sacramento, Calif.	0.6	7.0
Salt Lake City, Utah.....	1.0	10.6
San Diego, California.....	1.5	9.9
San Francisco, Calif.....	1.4	9.9
Seattle, Washington	0.9	7.6
Spokane, Washington	0.8	5.0
Tacoma, Washington	1.7	10.5

Source: Appendix Table VII.

⁶ Assuming that some of the additional workers were already employed when their families were canvassed, the estimated figures should be revised upward. However, since the 1915 depression was comparatively short and probably only a few jobseekers forced into the labor market would have had enough time to find jobs, this correction is unlikely to change much the figures above.

CHAPTER XIII

ADDITIONAL WORKERS AT THE BEGINNING OF THE DEPRESSION

(April 1, 1930)

AT THE TIME the 1930 census was taken, the public had not yet realized that the prosperity of the 1920's was over. After reaching the peak in September 1929, factory employment had begun to decline several weeks before the collapse of the stock market. In the following six months the Bureau of Labor Statistics monthly index of factory employment dropped 10 points, but official comments tended to minimize the significance of its decline.

The Department of Labor, for example, pointed out that the October decline in employment was due mainly to the reduction of personnel in the automobile and automobile tire industries.¹ In November there was an "unusually" sharp seasonal decline.² No explanation was given to the 3-point drop in December, but analyzing the labor market in January 1930, the *Monthly Labor Review* emphasized that the observed contraction in employment was seasonal.³ In February only an unusually small seasonal growth of employment was perceived.⁴ The April changes seemed again to follow the most general seasonal trends.⁵

On April 1, 1930, the number of workers on the payrolls of industrial establishments was 1.4 to 1.5 million less than a year before. The heaviest losses had occurred in manufacturing industries (600,000 to 700,000) and building construction (400,000). Mining had likewise reduced its personnel (by approximately 100,000), and as many employees had been laid off by steam railroads. However, the downward movement was not yet universal; no appreciable decline in employment had taken place, for example, in retail and wholesale trade, banking, hotels, public utilities, service establishments of all kinds, etc.

¹ *Monthly Labor Review*, December 1929, p. 169.

² *Ibid.*, January 1930, p. 150.

³ *Ibid.*, March 1930, p. 150.

⁴ *Ibid.*, April 1930, p. 174.

⁵ *Ibid.*, June 1930, p. 200.

In the same 12-month period, agricultural employment had dropped by several hundred thousands, but the extent of the resulting flow of additional jobseekers in urban pursuits is not known. Since it is fairly probable that some of the temporary workers employed during the short boom just before the collapse were no longer in the labor market when the census was taken, it is extremely difficult to estimate the growth of unemployment in the 12 months preceding the census.

Wholesale layoffs were reported in only a few industries, while in manufacturing as a whole the monthly separations in the last quarter of 1929 were not much more numerous than in the same season of the preceding year. Factory employment declined mainly because separated workers were not replaced and the number of hirings was cut in half.

A comparison of the psychological conditions at that time and those under which later enumerations of unemployment were taken suggests that, in April 1930, people were more inclined to optimistic illusions than to excessive pessimism. This is in accordance with the observation made in Part II of this study that some of the newly separated workers failed to report as unemployed.⁶ However, this does not exclude the possibility that additional workers entered the labor force. Since the 1930 census gives no information on the distribution of the unemployed by families, the methods developed in Chapter XI for ascertaining the presence of additional workers and measuring their probable number are not applicable to these statistics. Certain conclusions, however, may be drawn from an analysis of specific items of the census.

UNEMPLOYMENT BY CLASS OF WORK

The occupational classification of the 1930 unemployment statistics is the same as the classification of gainful workers in the Census of Population, and makes no distinction between employees and employers. In the census report, the number of Class A and B unemployed⁷ is compared with the total number of employees, employers, and self-employed persons of the same sex,

⁶ See Chapter IX, pp. 89-90.

⁷ Class A includes "persons out of jobs, able to work, and looking for a job;" Class B contains "persons having jobs but on layoff without pay, excluding those sick or voluntarily idle."

race, and age. Since only a few employers and self-employed persons were reported as unemployed, the unemployment rates for occupational groups with a large proportion of independent persons were understated in comparison with those for typical wage-worker occupations; e.g., unemployment in agriculture, trade, and services was understated in comparison with mining and manufacturing. Similarly, the unemployment rates for men and older workers were understated in comparison with those for women and younger groups.

To some extent this distortion may be corrected by a retabulation of the reported data to show employer and employee occupations separately.⁸

(See Table 15.)

The reported average rate of unemployment on April 1, 1930 for all occupations and industries was 6.5 per cent, but the exclusion of agriculture and the proprietary group in industrial pursuits raises the unemployment rate to 8.8 per cent for all non-agricultural employees, and to 11.0 per cent for industrial wage earners.

The contrast between unemployment among men and women appears more pronounced after proprietors are excluded. The census reported as unemployed 7.1 per cent of all male gainful workers and 4.7 per cent of the female workers, the rate for women being one-third smaller than that for men. But among non-agricultural employees, 9.9 per cent of the men and 5.2 per cent of the women were out of work, so that the severity of unemployment among women was nearly one-half less than among men.

On the other hand, it will be noticed that in this early phase of the depression there was no appreciable difference in the severity of unemployment among skilled, semi-skilled, and unskilled workers. If service workers are added to the unskilled group in non-agricultural pursuits, the unemployment rate for this group is about the same as for the semi-skilled workers and slightly less than for the skilled.

⁸ See Woytinsky, *Labor in the United States*, pp. 147-50, 312-15. Not all tabulations of the 1930 unemployment census may be rearranged in this way. In most of them only two rough adjustments may be effected: (a) figures for non-agricultural pursuits may be segregated from those for agriculture; (b) from the figures for non-agricultural pursuits, a few typically independent occupations may be excluded. Since the list of occupations used in the 1930 unemployment statistics is not equally complete in different tables, the last adjustment cannot be carried out very consistently.

TABLE 15. PROPORTION OF THE UNEMPLOYED AMONG GAINFUL WORKERS, BY INDUSTRIAL DIVISIONS AND CLASS OF WORK, IN THE UNITED STATES, APRIL 1, 1930
(In per cent—Classes A and B combined)

Industrial divisions and classes of work	Total	Male	Female
ALL INDUSTRIES.....	6.5	7.1	4.7
Employers and self-employed.....	0.8	0.7	1.2
Unpaid family workers.....	0.0	0.0	0.0
Professional persons:			
Independent.....	0.4	0.3	1.4
Dependent.....	3.2	4.4	2.4
Salaried employees, including managers.....	4.1	4.2	3.9
Skilled workers, including foremen.....	10.9	11.0	5.4
Semi-skilled workers.....	10.5	11.1	8.8
Unskilled workers.....	10.6	10.7	7.6
Service workers:			
In establishments.....	4.9	4.9	4.9
In homes.....	4.3	5.7	4.2
Agriculture, Forestry, Fishing.....	1.6	1.6	1.2
Employers and self-employed.....	0.2	0.2	0.1
Unpaid family workers.....	0.0	0.0	0.0
Salaried employees, including managers.....	1.7	1.8	0.3
Skilled workers, including foremen.....	—	—	—
Unskilled workers.....	5.3	5.2	6.4
Non-agricultural Pursuits.....	7.9	8.9	5.0
Employers and self-employed.....	1.6	1.6	1.7
Professional persons:			
Independent.....	0.4	0.3	1.4
Dependent.....	3.2	4.4	2.4
Salaried employees, including managers.....	4.1	4.2	3.9
Skilled workers, including foremen.....	10.9	11.0	5.4
Semi-skilled workers.....	10.5	11.1	8.8
Unskilled workers.....	13.3	13.5	8.6
Service workers:			
In establishments.....	4.9	4.9	4.9
In homes.....	4.3	5.7	4.2

Source: Computed from Woytinsky, *Labor in the United States*, Appendix Table XII, pp. 312-15.

UNEMPLOYMENT BY AGE AND SEX

Unemployment rates by age and sex are shown in Table 16 and Diagram XIX. The suggested reclassification not only increases the unemployment rates for all age and sex groups but also emphasizes their differences. The dotted curve of unemployment rates for men in Diagram XIX has a U-shape, with a pronounced concentration of unemployment in the lowest and highest age groups (under 25 and over 45 years of age); but in the census report these differences are concealed by the large proportion of

TABLE 16. PROPORTION OF THE UNEMPLOYED AMONG ALL GAINFUL WORKERS, AND INDUSTRIAL SALARY AND WAGE EARNERS, BY SEX AND AGE, IN THE UNITED STATES, APRIL 1, 1930
(In per cent—Classes A and B combined)

Age-classes	All occupations		Non-agricultural pursuits		Industrial salary and wage workers	
	Male	Female	Male	Female	Male	Female
ALL AGE-CLASSES	7.1	4.7	8.9	5.0	9.9	5.2
10-19 years	8.1	6.2	13.2	7.2	13.3	7.2
20-24 years	8.8	4.7	11.2	4.9	11.4	4.9
25-29 years	6.9	4.4	8.1	4.5	8.7	4.6
30-34 years	6.1	4.3	7.2	4.5	8.0	4.6
35-39 years	6.2	4.4	7.4	4.6	8.4	4.8
40-44 years	6.5	4.3	7.9	4.5	9.1	4.8
45-49 years	6.9	4.3	8.7	4.6	10.0	5.0
50-54 years	7.0	4.2	9.1	4.6	10.6	5.0
55-59 years	7.3	4.2	9.8	4.7	11.4	5.2
60-64 years	7.3	3.9	10.0	4.4	11.7	5.0
65 years and over	6.5	3.2	9.9	3.9	11.7	4.5

Source: Fifteenth Census of the United States: 1930, Unemployment, Vol. II, p. 250. Figures for all occupations are those of the Census. All other figures are calculated as explained in the text.

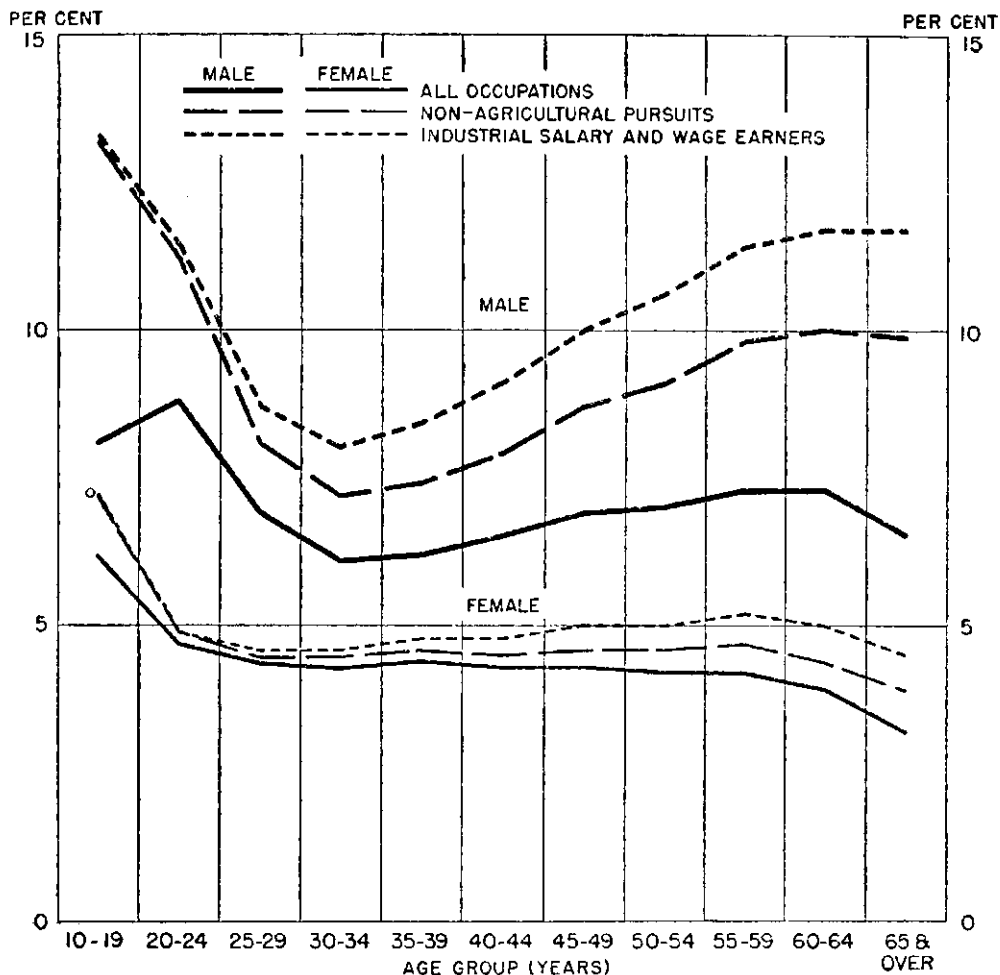
unpaid family workers in the youngest age-classes and of employers and self-employed persons in the older groups.

To some extent the disparity in the intensity of unemployment by age may reflect differences in the efficiency of workers. When reducing personnel, an employment manager is reluctant to lay off the most efficient workers who have not yet reached the age when their economic value for the establishment begins to decline. It is natural, therefore, that differences in unemployment rates by age follow a pattern opposite to that of differences in the earnings of workers, and the U-shape curve of unemployment rates in Diagram XIX reflects the bell-shape variation of pay rates of workers classified by age.

It is fairly probable, however, that the concentration of the unemployed in the youngest and oldest age-classes was due, at least to some extent, to the entry of additional jobseekers. They naturally would come from those groups of population in which there are reserves for the labor force. So far as the male population is concerned, these are the youngest and oldest age-classes, while among women significant reserves are found in all age groups. The entry of additional jobseekers would therefore emphasize the U-shape of the curve of unemployment rates by age for men and would have little effect on that for women.

DIAGRAM XIX

PER CENT OF UNEMPLOYED AMONG ALL GAINFUL WORKERS AND INDUSTRIAL SALARY AND WAGE EARNERS, BY SEX AND AGE, IN THE UNITED STATES, APRIL 1, 1930



UNEMPLOYMENT BY MARITAL STATUS

The 1930 census showed the following distribution of unemployed women gainful workers by marital status :⁹

	Totals	Single or unknown	Married	Widowed or divorced
<i>In thousands</i>				
Class A	370.3	205.6	92.5	72.2
Class B	131.2	66.5	44.8	19.8
Total	501.5	272.1	137.3	92.0

If these figures are compared with the distribution by marital status of female non-agricultural employees as enumerated by the

⁹ Fifteenth Census of the United States: 1930, Unemployment, Vol. II, p. 344.

census, it appears that the unemployment rate was 4.8 per cent among single women, 5.1 per cent among married, and 6.3 per cent among widowed and divorced. As the median age of widowed and divorced women engaged in gainful work was close to 50 years, compared with 31 years for married and about 23 for single women, the comparatively high unemployment rate in the first group was as expected. But the higher unemployment rate among married than among single women is in contradiction with the difference in age of the two groups, and seems to suggest the forced entry into the labor market of wives of workers who had lost their jobs.

It is possible that additional workers were also among single women (daughters of unemployed workers) and among widow heads of broken families in which the children were laid off because of slack business conditions. But the proportion of forced entries from these groups could not be as high as that from the groups of workers' wives accustomed to apply for work whenever the family budget required supplementary earnings.

These are only indirect indications suggesting the presence of additional workers on the labor market at this phase of the depression. The distribution of unemployment by family relationship is more conclusive.

UNEMPLOYMENT BY FAMILY RELATIONSHIP

Unemployed workers (Classes A and B combined) returned by the 1930 census were distributed by family relationship as follows: ¹⁰

	Total	Heads of families	Persons living alone	Related family members	Lodgers, residing servants, etc.
			<i>In thousands</i>		
Total	3,187.7	1,401.1	126.0	1,241.7	418.8
Male	2,686.2	1,352.5	91.7	881.7	360.3
Female	501.5	48.6	34.3	360.0	58.5
			<i>In per cent</i>		
Total	100.0	43.9	4.0	39.0	13.1
Male	100.0	50.3	3.4	32.8	13.5
Female	100.0	9.8	6.8	71.7	11.7

¹⁰ Fifteenth Census of the United States: 1930, Unemployment, Vol. II, p. 336. Similar tabulations by periods of idleness have been published also for geographic divisions and single states (pp. 337, 338). Volume I of the census report contains an abbreviated classification by family relationship, without distinguishing between lodgers and persons living alone (pp. 14, 51, 52).

Since the 1930 occupational statistics are not classified by family relationship, it is impossible to compute unemployment rates for workers in the different family groups. The required information may be obtained only indirectly from family statistics, namely, from the tables showing the distribution of families by number of gainful workers. The national totals of these tables are briefly summarized in the following tabulation: ¹¹

Number of gainful workers per family	Number of families		
	Total	Farm families	Non-farm families
Total	29,904,663	6,604,637	23,300,026
None	1,803,871	121,321	1,682,550
1	18,568,705	4,274,677	14,294,028
2	6,321,816	1,387,063	4,934,753
3	2,140,386	519,456	1,620,930
4 or more.....	1,069,885	302,120	767,765

Assuming that the average number of gainful workers in families with 4 or more earners was 4.5, there were 9,966,711 gainful workers in farm families and 32,481,266 in non-farm families, with a grand total 42,447,977. The census enumerated a total of 48.8 million persons engaged in gainful pursuits, so the number of gainful workers who did not belong to private families should be nearly 6.4 million, partly in the "quasi-family" groups and partly lodgers, resident servants, etc.

On the assumption that most of the persons classified in the group of one-person households were engaged in a gainful occupation, the total gainfully occupied population may be tentatively distributed as follows:

	In millions
All gainful workers.....	48.8
Members of families.....	42.4
One-person households	2.4
Other	40.0
Not members of families.....	6.4
In quasi-family groups.....	2.4
Lodgers, resident servants, etc.....	4.0

A closer insight into the family relationship of gainful workers on April 1, 1930 is obtained from the reported distribution of

¹¹ Fifteenth Census of the United States: 1930, Population, Vol. VI, pp. 22-24.

families by sex of the family head.¹² With the help of specific assumptions,¹³ a tentative distribution of gainful workers by sex, age, and family relationship, separately for farm and non-farm families, is obtained. It is presented in Appendix Table VIII. The proportion of family heads among male workers in different age-classes is illustrated by Diagram XX.

If the gainful workers in one-person households are segregated from the rest of the family heads, the following approximate percentage distribution of gainful workers by family relationship on April 1, 1930 is found:

	Total	Heads of families	Persons living alone	Relatives, lodgers, etc. ¹⁴
ALL FAMILIES				
Total	100.0	48.6	4.8	46.6
Male	100.0	58.9	4.8	36.4
Female	100.0	12.1	4.9	83.0
FARM FAMILIES				
Total	100.0	54.7	3.2	42.1
Male	100.0	57.4	3.2	39.3
Female	100.0	25.6	3.3	71.1
NON-FARM FAMILIES				
Total	100.0	46.9	5.2	47.9
Male	100.0	59.3	5.3	35.4
Female	100.0	10.8	5.1	84.1

Since unemployment in 1930 was concentrated in non-agricultural pursuits, i.e., in non-farm families, the figures for this group

¹² The families enumerated by the 1930 census were distributed by sex of the family head as follows:

	Total	With man head	With woman head
All families	29,904,663	26,111,761	3,792,902
Farm families	6,604,637	6,218,390	386,247
Other families	23,300,026	19,893,371	3,406,655

Source: Fifteenth Census of the United States: 1930, Population, Vol. VI, pp. 27-28.

¹³ The number of male family heads engaged in gainful work is estimated on the assumption that, in each age-class over 25, the proportion of gainful workers among family heads was about the same as among all men, while family heads under 25 years of age were all—or almost all—engaged in gainful work.

The distribution of women workers by family relationship is based on the assumption that most of the married women engaged in gainful pursuits were supplementary earners, while the number of working female family heads in each age-class was equal to the number of widows and divorced female workers in these age-classes.

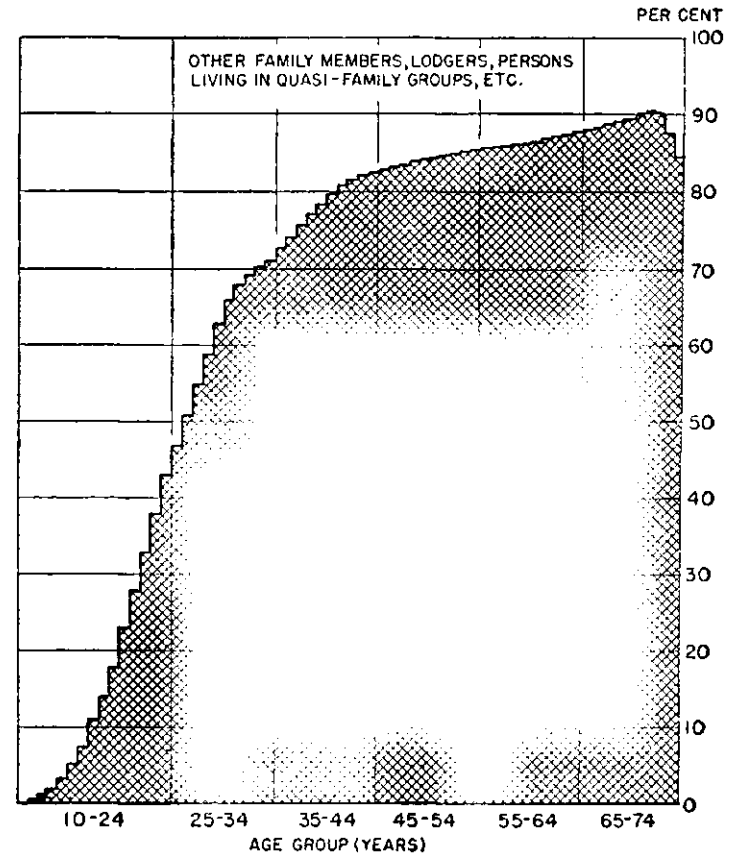
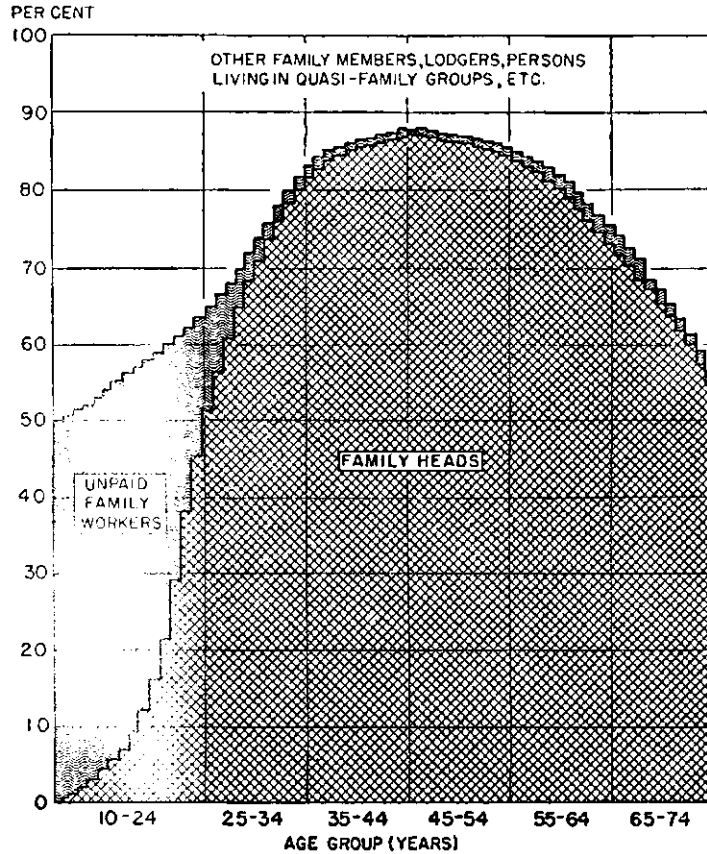
¹⁴ Including persons living in "quasi-family" groups.

DIAGRAM XX

ESTIMATED PERCENTAGE DISTRIBUTION OF MALE GAINFUL WORKERS IN SPECIFIED AGE CLASSES, BY FAMILY STATUS, IN THE UNITED STATES, APRIL 1, 1930

A. IN AGRICULTURE

B. IN NON-AGRICULTURAL PURSUITS



should be compared with the returned distribution of unemployed workers by family relationship, shown on page 156. It should be kept in mind, however, that there may be an appreciable disparity in the distribution of employees and employers by family relationship in non-farm families. For example, it is probable that most of the proprietors and independent workers are heads of families or live alone (in one-person households). Accordingly the proportion of household heads among employees should be smaller, and the proportion of related family members, lodgers, etc., larger than the average for all non-agricultural gainful workers.

The proportion of family heads and persons living alone amounts to 47.9 per cent (43.9+4.0) among the unemployed, and to 52.1 per cent among all workers, in non-farm families. But if employers and self-employed persons, who supposedly were family heads in most cases, are excluded from the last number, it is found that approximately 46 per cent of the employees were family heads or lived alone.

There were, however, appreciable differences in the distribution of male and female gainful workers by family relationship. As the preceding tabulation shows, 64.6 per cent of the male gainful workers in non-farm families in 1930 were family heads (or lived alone). After excluding proprietors, it is found that the proportion of family heads among industrial employees was likely to be at least 59.0 per cent, considerably more than the proportion of family heads among unemployed male workers reported by the census (53.7 per cent).

The proportion of family heads among female gainful workers in non-farm families shown in the preceding tabulation amounted to 15.9 per cent. But it is likely that this figure included women who were either proprietors or worked on their own account.¹⁵ Consequently the proportion of family heads among women employees was considerably less than that among unemployed women workers as reported by the 1930 census (16.6 per cent).

¹⁵ According to occupational statistics, 6.6 per cent of the female gainful workers in 1930 belonged to the proprietary group.

To sum up, the following unemployment rates by sex and family relationship are found :

	Estimated proportion of unemployed (Classes A and B) among non-agricultural employees on April 1, 1930, in per cent		
	Total	Male	Female
Total	8.8	10.2	5.2
Family heads and living alone.....	9.2	9.3	8.7
Related family members.....	8.4	11.5	4.8

It appears, therefore, that unemployment among male family heads was less severe than among other male family members, and that the reverse was true for women. An explanation for these differences may be found in the hypothesis of the entry of additional workers. As almost all male family heads are usual gainful workers, additional male jobseekers would have to come from the group of related family members. On the other hand, not all women heads of families, especially broken families, are usual workers, so that reserves for the labor force would be found among them rather than among the groups of related female family members.

UNEMPLOYMENT BY FAMILY RELATIONSHIP AND DURATION OF IDLENESS

The theory that the unemployment of the usual breadwinner may cause other members of his family to seek jobs is supported by the differences in the distribution by duration of idleness of men and women in different family relationship groups, as shown in Table 17. However, it is recognized that in this case the analysis is not very conclusive. In fact, there may be two kinds of correlation between the family status of the unemployed and their duration of idleness. On the one hand, since family members who hitherto have not been working for pay are forced into the labor market by the layoff of usual earners, there must be households in which the unemployment of the family head has preceded that of other family members. On the other hand, unemployment may result in the shifting of individuals from one family relationship group into another. A former head of the family may, for example, leave his home and move to another town in search of a job, which would involve his shift into the group of lodgers or persons living alone. On the other hand, an unemployed who

TABLE 17. PERCENTAGE DISTRIBUTION OF THE UNEMPLOYED BY DURATION OF IDLENESS AND FAMILY RELATIONSHIP, IN THE UNITED STATES, APRIL 1, 1930

Unemployment classes	Total	Duration of idleness						
		Under 1 week	1 or 2 weeks	3 or 4 weeks	5 to 8 weeks	9 to 13 weeks	14 to 26 weeks	27 weeks or more
CLASS A								
<i>Male</i>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Head of family....	47.7	52.7	48.9	46.9	46.4	46.7	47.1	50.3
Relative.....	34.2	30.6	31.9	33.9	34.1	35.0	35.1	34.9
Lodger.....	14.5	12.5	15.5	15.8	16.2	15.0	14.2	11.0
Living alone.....	3.6	4.2	3.7	3.4	3.3	3.3	3.6	3.8
<i>Female</i>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Head of family....	9.8	12.6	10.4	9.8	9.4	9.8	9.5	9.2
Relative.....	69.6	64.0	66.1	67.3	69.1	71.6	73.0	72.5
Lodger.....	13.2	14.8	16.0	15.4	14.4	12.0	10.7	9.9
Living alone.....	7.4	8.6	7.5	7.5	7.2	6.6	6.9	8.4
CLASS B								
<i>Male</i>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Head of family....	59.1	63.8	58.6	56.2	56.9	54.9	53.9	56.2
Relative.....	28.4	24.6	28.1	30.8	30.9	32.9	32.7	31.6
Lodger.....	9.6	9.0	10.4	10.1	9.6	9.3	9.7	8.7
Living alone.....	2.9	2.6	2.9	2.9	2.6	2.9	3.7	3.5
<i>Female</i>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Head of family....	9.4	9.4	9.3	9.7	9.3	9.2	9.6	8.8
Relative.....	77.9	79.1	76.4	76.5	77.5	79.8	79.1	78.1
Lodger.....	7.3	6.9	8.6	8.0	7.4	5.8	5.1	6.0
Living alone.....	5.4	4.6	5.7	5.8	5.8	5.3	6.2	7.1
CLASSES A AND B								
<i>Male</i>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Head of family....	50.4	61.6	52.1	48.9	48.2	47.8	47.9	50.6
Relative.....	32.8	25.8	30.6	33.3	33.5	34.7	34.8	34.6
Lodger.....	13.4	9.7	13.8	14.6	15.1	14.3	13.7	10.9
Living alone.....	3.4	2.9	3.5	3.3	3.2	3.2	3.6	3.9
<i>Female</i>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Head of family....	9.6	10.1	10.0	9.8	9.4	9.8	9.5	9.2
Relative.....	72.0	76.0	69.5	69.1	70.3	72.7	73.8	73.0
Lodger.....	11.6	8.5	13.5	13.9	13.3	11.1	10.0	9.6
Living alone.....	6.8	5.4	6.9	7.2	7.0	6.4	6.8	8.3

Source: Computed from Fifteenth Census of the United States: 1930, Unemployment, Vol. II, p. 336.

was living alone may join his family and shift into the group of related family members, or two families may merge into one household.

An intensive analysis of individual work histories is necessary in order to find out the influence of unemployment on the structure of families. A slight but inadequate indication of this influence is given by the cross-tabulation provided by the 1930 census of

duration-of-idleness statistics with those of family relationship.

The results of the tabulation, the census report comments, "seem to indicate that the duration of unemployment is practically equal in the four relationship groups. However, since the heads of families are in general older than the relatives or lodgers, it is probable that age for age the duration of unemployment would be shorter for heads of families than for the other relationship groups."¹⁶ The last statement would seem to imply that, age for age, heads of families were either fired later or rehired sooner, which is not confirmed by a closer examination of the figures.

In fact, if the absolute numbers returned by the census are converted into percentages, as in Table 17, it becomes evident that there were appreciable differences in the distribution by family relationship of Class A and B, male and female unemployed in different duration-of-idleness groups. The data presented in this table suggest the following variations in the distribution of unemployed workers by family relationship, with increasing duration of idleness:

(1) The proportion of family heads among male Class A unemployed declined up to the group with 5 to 8 weeks of idleness and up to the group of 14 to 26 weeks in Class B, and grew thereafter. A similar movement is observed among female Class A unemployed, while the figures for Class B are rather erratic.

(2) The proportion of relatives increased steadily up to the groups with 9 to 13 or 14 to 26 weeks of idleness among male unemployed in both classes, as well as among the female unemployed in Class A.

(3) The proportion of lodgers among male Class A unemployed increased up to the group with 5 to 8 weeks, and to that with 1 or 2 weeks in Class B, and decreased thereafter. Among the female unemployed in both classes, lodgers were relatively most numerous up to 1 or 2 weeks of idleness and their proportion dropped thereafter.

(4) The proportion of persons living alone declined with the duration of unemployment, but was remarkably high among male and female workers who had been out of jobs 27 weeks or more.

If persons living alone and heads of families are combined in one group, their proportion is found to vary with duration of idleness as follows (in per cent):

	Under 1 week	1 or 2 weeks	3 or 4 weeks	5 to 8 weeks	9 to 13 weeks	14 to 26 weeks	27 weeks or more
Male	64.5	55.6	52.2	51.4	51.0	51.5	54.5
Female	15.5	16.9	17.0	16.4	16.2	16.3	17.5

¹⁶ Fifteenth Census of the United States: 1930, Unemployment, Vol. II, p. 316.

The comparatively high proportion of family heads among the newly separated male workers may be accounted for by an under-enumeration of the unemployed supplementary workers laid off shortly before the enumeration: in fact omissions in the returns on unemployed family heads seem to be less probable than in the case of other family members. This observation does not apply to female heads of families who frequently are supplementary workers.

The fact that, in the duration intervals over 13 weeks, the proportion of family heads among the unemployed increases with the duration of idleness suggests that there was a lag between the beginning of unemployment for family heads and for other family members; more specifically, that some of the related family members became unemployed later than the family heads. It is a question of judgment whether to construct a theory of a lag in layoffs or to refer to the entry of additional workers from families with unemployed usual breadwinners.

The observed differences in the proportions of family heads by duration-of-idleness classes could have been caused by the entry into gainful work of approximately 120,000 or 150,000 persons in families in which the usual earners were out of work, and this seems to be the probable number of additional workers included in the returns of the 1930 census of unemployment.

This estimate does not exclude the probability of the presence in the labor force at this time of a number of temporary workers who were brought into the labor market by the boom in the summer and autumn of 1929.

CHAPTER XIV
 ADDITIONAL WORKERS IN A PERIOD
 OF INCREASING PRIMARY
 UNEMPLOYMENT

(January 1931)

THE SPECIAL CENSUS of unemployment taken in January 1931 covered 21 selected urban areas. The population of these areas on April 1, 1930 was 20.64 million, or 56.8 per cent of the total population of cities with 100,000 or more inhabitants.¹ Every effort was made to make the returns of the special census comparable to those of the 1930 census of unemployment, and the new data were incorporated into the 1930 census report.

As the following tabulation shows, the new enumeration revealed a tremendous increase in unemployment in the selected areas since the 1930 census: ²

	Total	Male	Female
<i>April 1, 1930</i>			
Gainful workers	9,465,987	6,932,225	2,533,762
Unemployed (Classes A and B).....	914,122	761,072	153,050
Unemployed in per cent of gainful workers..	9.7	11.0	6.0
<i>January 1931</i>			
Unemployed (Classes A and B).....	2,298,251	1,818,968	479,283
Absolute increase in unemployment.....	1,384,129	1,057,896	326,233
In per cent (Apr. 1, 1930=100).....	151.4	139.0	213.2

The purpose of the following analysis is to find out to what extent this growth in unemployment was due to a contraction in work opportunities and to what extent it was accounted for by an increasing supply of labor and the forced entry of additional workers. Before discussing in detail the statistics relevant to this problem, the total volume of unemployment in the United States in January 1931 should be estimated.

¹ Fifteenth Census of the United States: 1930, Unemployment, Vol. II, p. 365.

² *Ibid.*, p. 366. Cf. Appendix Table IX.

TOTAL UNEMPLOYMENT IN THE UNITED STATES IN
JANUARY 1931

A direct comparison of the number of unemployed in the canvassed areas on April 1, 1930 and in January 1931 suggests that unemployment increased by 151.4 per cent (139.0 per cent for men and 213.2 per cent for women). However, the raw figures shown in the preceding tabulation are not strictly comparable. As explained in Part II of this report, the distribution of the unemployed by duration of idleness returned by the two enumerations suggests that in 1930 a few newly separated workers were omitted, while in 1931 many part-time workers were tabulated as "having jobs but on lay-off without pay."³ The following figures have been adjusted to exclude part-time workers in 1931 and to compensate for the underenumeration of newly separated workers in 1930:

Unemployed (A and B) in the selected urban areas	Total	Male	Female
April 1, 1930.....	950,000	791,000	159,000
January, 1931.....	2,110,000	1,656,000	454,000
Absolute increase	1,160,000	865,000	295,000
In per cent.....	122.1	109.4	185.5

Since no census of gainful workers was taken in January 1931, the number of unemployed enumerated at this date in each city was compared in the census report with the number of workers in the same city on April 1, 1930. However, the number of gainful workers had increased between the two dates. This period included the season of graduation from schools,⁴ and it may be assumed that, aside from forced entries into the labor market, the number of potential gainful workers in the United States was 450,000 to 500,000 larger in January 1931 than on April 1, 1930. Assuming that the number of gainful workers in the canvassed areas increased at the same rate as in the nation as a whole, i.e., by approximately 1 per cent, it is found that of the total increase in unemployment of 1,160,000, approximately 95,000 were accounted for by the natural growth in population and 1,065,000

³ See pp. 89-91.

⁴ According to instructions to enumerators, young persons who had not yet obtained their first jobs were not to be counted as gainful workers. It is not very clear whether this rule was strictly observed.

represented the net decline in the demand for labor plus the influx of additional workers.

Thus, allowing for the natural growth in the labor force, it is found that between the two enumerations the rate of unemployment in the selected urban areas increased not from 9.7 to 24.2 per cent as suggested in the census reports, but from approximately 10.1 to 22.1 per cent.

The reported average unemployment rate in the selected urban areas on April 1, 1930 (9.7 per cent) was considerably higher than the national average for all non-agricultural pursuits (7.9 per cent, as shown in Table 15). It may be assumed that the corrected average unemployment rate for the same areas in January 1931 (22.1 per cent) was likewise higher than the national average. The proportion of unemployed in all non-agricultural pursuits in January 1931 may be estimated therefore at 17 or 18 per cent, and the absolute volume of non-agricultural unemployment at over 7 millions. Rural unemployment increased by approximately 1,000,000 between the two censuses, in accordance with the seasonal rhythm. Consequently, the total number of unemployed in January 1931 was probably somewhat over 8 millions, which would mean a net increase after the 1930 census of almost 5 millions.

Since the normal increment of the labor force amounted to 450,000 to 500,000, the combined effect of declining employment and the forced entry of additional jobseekers was a growth in the number of unemployed workers of about 4.5 millions.

CHANGES IN EMPLOYMENT AND UNEMPLOYMENT FROM APRIL 1, 1930 TO JANUARY 1931

Estimators of unemployment who took the 1930 census as the starting point of their calculations have long ago discovered that the changes in unemployment shown by the returns of the two enumerations for the same areas did not agree with the variations of employment indicated by the monthly employment returns of the Bureau of Labor Statistics. They tried to offset this disparity by raising the 1930 unemployment figures,⁵ and this adjustment

⁵ Robert R. Nathan, for example, found that, according to the BLS employment indexes, the number of persons employed in the industries covered on April 1,

of the benchmark for monthly unemployment estimates was one of the several sources of their upward bias.

The preceding analysis shows, however, that the overstatement of unemployment by the special census was more important than the understatement by the 1930 enumeration. This reduces considerably the disparity between the growth of unemployment and the probable decline of employment in the canvassed areas. The slight remaining disparity might be accounted for by three factors: (a) employment in the selected urban areas might have declined more than the average rate for the whole country; (b) industries not covered by the BLS employment indexes might have laid off a larger part of their personnel than the covered industries; (c) the entry of additional jobseekers caused by the increasing primary unemployment from April to December 1930 might have more than offset the gradual withdrawal from work of those additional workers who had remained on the labor market after the 1929 boom.

In any case, a comparison of the reported growth of unemployment in the selected urban areas with the national employment statistics is not sufficient by itself to provide evidence either for or against the presence of additional workers. The problem should be approached from another angle, i.e., from an analysis of the changes in the composition of unemployment between the two enumerations.

UNEMPLOYMENT BY SEX

The proportion of women among Classes A and B unemployed in the selected urban areas grew from 16.7 per cent on April 1, 1930 to 21.5 per cent in January 1931, and their part in the net increase of unemployment amounted to 25.5 per cent.⁶

1930 was 113.66 per cent of the number employed in January 1931. On the other hand, the two unemployment censuses indicated that the number employed in the same industries in the selected urban areas in April 1930 was 116.49 per cent of the number employed in January 1931. Accordingly, if the 1931 census is accepted as accurate, the number reported as employed by the 1930 census should be reduced to 97.6 per cent ($113.66 \div 116.49$) of its stated level. Applying this correction ratio to the 1930 figures, Nathan came to the conclusion that the number of employed in April of that year should be reduced and the number of unemployed should be raised by approximately 1 million. ("Estimates of Unemployment in the United States, 1929-1935," *International Labor Review*, January 1936, p. 63.)

⁶ According to the adjusted figures on p. 166.

As Appendix Table IX shows, the net increase in the number of women seeking work in 20 areas was proportionally larger than that of unemployed men, and the inverse relationship was reported in only one area. This is particularly important in view of the fact that between the two censuses the heaviest layoffs took place in industries which employ men almost exclusively (lumber, automobiles, iron and steel, stone, clay and glass products), while the industries which typically employ women were less affected by the depression.⁷

The increase in the unemployment of women was heavily concentrated in domestic and personal service, especially in private homes.⁸ Since there is no evidence of a particularly severe reduction of employment in domestic service during this period, it is probable that the number of women seeking work as domestic

⁷ The correlation between the proportion of female workers and the decline in employment in manufacturing industries is illustrated by the following figures:

	Proportion of employed women, April 1, 1930 in per cent	Decline in employment from April 1, 1930 to January 1931, in per cent
Lumber and allied products.....	4	28
Automobile industry	6	24
Iron and steel.....	7	22
Stone, clay, and glass products.....	12	25
Chemicals and allied products.....	17	12
Rubber products	18	16
Food and kindred products.....	21	8
Paper and printing.....	24	9
Leather and its manufactures.....	25	15
Textiles and clothing.....	45	14
Tobacco manufactures	64	14

Source: Fifteenth Census of the United States: 1930, Unemployment, Vol. I, and BLS employment indexes for the United States as a whole.

⁸ Female gainful workers and the unemployed among them in the 21 urban areas were distributed as follows:

	Total	Domestic and personal service		All other industries
		In service establish- ments *	In homes of employers **	
Gainful workers, April 1, 1930....	2,533,762	222,822	449,034	1,861,906
Unemployed (Classes A and B):				
April 1, 1930.....	153,050	13,964	28,264	110,822
January 1931	479,283	52,153	121,301	305,829
Absolute increase	326,233	38,189	93,037	195,007
In per cent.....	213.2	273.5	329.2	176.0

* Hotels, restaurants, boarding houses, etc.; laundries and cleaning, dyeing and pressing shops.

** "Other domestic and personal service" in the census classification.

servants included not only those who had lost their jobs in this occupation, but also those forced into the labor market by the layoff of the usual breadwinners in their families.

UNEMPLOYMENT BY AGE

Unemployment increased between 1930 and 1931 in all age and sex groups, but its net gains in per cent of the unemployed enumerated in 1930 varied widely from group to group. The increment for each group is shown below (Classes A and B unemployed) :⁹

Age-classes	Absolute numbers (in thousands)				Rate of increase (in per cent)	
	April 1, 1930		January 1931		Male	Female
	Male	Female	Male	Female		
15 to 19.....	59.5	32.2	137.3	105.5	131.0	227.8
20 to 24.....	111.3	35.0	265.6	114.1	138.7	225.7
25 to 29.....	94.1	21.9	227.6	68.0	141.8	209.8
30 to 34.....	84.3	15.2	211.3	49.0	150.6	222.8
35 to 39.....	90.4	14.2	238.8	46.1	164.2	225.2
40 to 44.....	83.0	10.5	215.8	34.6	160.2	228.8
45 to 49.....	74.5	8.7	180.3	29.0	142.2	235.2
50 to 54.....	59.7	6.3	137.6	17.6	130.7	179.9
55 to 59.....	43.8	4.1	87.1	8.7	99.0	109.6
60 to 64.....	31.0	2.5	63.9	5.4	106.1	112.2

The increase in the unemployment rate among men was most pronounced in the middle age-classes (from 30 to 44 years) and was less so in the lower and higher ages. This is precisely opposite to the distribution of the unemployed by age-classes on April 1, 1930, as shown in Table 16 and Diagram XIX in the preceding Chapter. In other words, the increase in unemployment among men from April to December 1930 was distributed more evenly by age-classes than was the unemployment which had accumulated before April 1930. This seems to indicate that in the very early part of the depression the youngest and oldest were particularly numerous among the separated workers, while later all age-classes were more evenly affected.

Very different were the increased rates of unemployment among women. The comparatively smaller increments were returned for the age-classes from 25 to 29 years on the one hand and of 50 and over on the other. The largest of the increased rates were in

⁹ Computed from the Fifteenth Census of the United States: 1930, Unemployment, Vols. I, II.

the age-classes under 24 years and from 35 to 49 years, i.e., in those age-classes which contain considerable reserves of labor and from which the entry of additional workers is most probable.

The volume of secondary unemployment among women in the selected urban areas may be estimated at 100,000 or somewhat more, which would mean that there was one additional woman seeking work per 10 usual earners who had lost their jobs. If the same rate is applied to the whole country, it would seem that from April 1, 1930 to January 1931 the depression had forced into the labor market about 400,000 women who formerly had not been engaged in gainful work. This probably represented the net increase in the number of female additional workers since April 1, 1930. Together with the 120,000 or 150,000 additional job-seekers who were already on the labor market at that time, the total number of additional workers in January 1931 might be estimated at approximately 500,000 or 550,000.

The supposition that additional workers were one of the causes of the increase in the proportion of unemployed women in selected urban areas in January 1931 is confirmed by statistics on the marital status of unemployed women reported by the 1930 and 1931 censuses.

UNEMPLOYMENT BY MARITAL STATUS OF WOMEN

For the areas covered by the 1931 unemployment census, unemployed women were distributed by marital status as follows:¹⁰

	Total	Single ¹¹	Married	Widowed and divorced
April 1, 1930.....	153,050	91,984	33,740	27,326
January 1931	479,283	272,955	136,603	69,725
Absolute increase	326,233	180,971	102,863	42,399
In per cent.....	213.2	196.7	304.9	155.2

Unemployment among widowed and divorced women increased in approximately the same proportion as among men. But in comparison with this increased rate, the number of single women and housewives who were seeking work was unexpectedly large,

¹⁰ Computed from the Fifteenth Census of the United States: 1930, Unemployment, Vol. II, pp. 347-50, 596-99.

¹¹ Including those whose status is unknown

the excess amounting to 50,000 in each group. This excess might result either from employers' policy toward married and single women, or from the entry of new jobseekers into the labor market. The first explanation is not very plausible. Perhaps some firms or employment managers, when confronted with the necessity of laying off employees, may have selected them on the basis of their family or marital status, but certainly this policy was not put into practice by the great majority of employers in early 1931. On the other hand, if there were additional female jobseekers on the labor market at that time, they would be mainly wives and daughters of usual breadwinners who had lost their jobs.

The number of female additional workers who entered the labor market from April 1, 1930 to January 1931 is tentatively estimated at 400,000, and the total number of forced entrants—men and women combined—at 500,000 in round numbers. In accordance with this estimate, the almost 5 million increase in unemployment between the two enumerations would be segregated as follows:

Layoffs due to declining business, aggravated by the slack season (particularly in agriculture and construction).....	4,000,000
Increase in the labor force due to the normal growth of the population.....	450,000 to 500,000
Influx of additional jobseekers (mainly women) caused by the unemployment of usual earners	approximately 500,000

CHAPTER XV

ADDITIONAL WORKERS IN CONSECUTIVE PHASES OF THE DEPRESSION

(Philadelphia Sample, 1931-1938)

THE MOST INCLUSIVE STATISTICS on the distribution of unemployment by families of different size were collected in Philadelphia from 1929, first by the Industrial Research Department of the University of Pennsylvania and later in cooperation with the National Research Project of the Works Progress Administration.¹ The enumeration was taken in a selected sample of blocks in ten school districts, covering about one-tenth of the city's employable population. The surveys registered as "employable" all persons 16 years of age and over who were working or seeking work. In 1931, 1932 and 1933, persons not seeking work because of temporary illness were counted as "employable;" since 1935 they were no longer registered as gainful workers. Aside from this change in definition, there is every reason to believe that the findings for the period from 1931 to 1938 are comparable from year to year.

The canvassed households, classified by number of employable persons, were segregated into three groups by employment status:

Complete employment—households with all workers employed on a full or part-time basis;

Partial unemployment—households with 1 or more workers employed and 1 or more workers unemployed;

Complete unemployment—households with all workers unemployed.

In addition, families canvassed in 1938 were cross-classified by number of gainful workers and number of individuals working full-time, employed part-time, and completely unemployed. Tabulations by age, sex, occupation, education, duration of unemployment, etc., were likewise prepared.

¹ J. F. Dewhurst and E. A. Tupper, *Social and Economic Character of Unemployment in Philadelphia, April 1929* (U. S. Bureau of Labor Statistics, Bulletin No. 520); J. F. Dewhurst and R. Nathan, *Social and Economic Character of Unemployment in Philadelphia, April 1930* (Bureau of Labor Statistics, Bulletin No. 555). Gladys L. Palmer, *Recent Trends in Employment and Unemployment in Philadelphia; Employment and Unemployment in Philadelphia in 1936 and 1937*, Part I: May 1936, Part II: May 1937 (Philadelphia: Works Progress Administration); Gladys L. Palmer and Samuel M. Cohn, *Employment and Unemployment in Philadelphia, July-August 1938* (Philadelphia: University of Pennsylvania Press), Special Report No. 7.

The representativeness of the canvassed families for the entire working population of Philadelphia is evidenced by a comparison with the returns of the 1931 census of unemployment for this city.²

Groups of workers	Unemployment in Philadelphia (in per cent)			
	Labor market survey April-May, 1931		Census of Unemployment, Jan. 1931 ³	
	Male	Female	Male	Female
TOTAL	26.4	24.1	29.0	24.3
Native-born white	24.3	22.7	27.6	22.1
Foreign-born white	26.3	15.5	26.5	14.2
Negro and all other	36.8	31.8	41.6	41.0
AGE-CLASSES				
15-19	42.8	35.1	45.1	35.1
20-24	36.4	26.0	36.7	25.2
25-29	27.8	21.3	28.4	23.1
30-34	24.1	21.9	26.1	22.9
35-39	22.3	20.3	27.5	23.4
40-44	21.9	20.7	28.3	22.7
45-49	22.5	19.6	29.5	21.0
50-54	24.0	21.6	26.2	17.6
55-59	24.4	22.0	24.0	12.8
60-64	29.4	25.8	24.5	13.6
65 and over	34.4	26.1	20.8	9.5

The only major disparity between the two enumerations is in the unemployment rates for elderly persons (women 50 years and over and men 60 years or more). Apparently the concepts of "gainful worker" and "unemployed" were in doubtful cases interpreted more broadly by the labor market survey than by the 1931 census. All other differences between the unemployment rates are of minor significance and may be explained by the seasonal recovery between January and May 1931.⁴ It should be kept in mind also that the January unemployment rates might be somewhat overstated (1) because they included part-time workers (in Class B unemployed), and (2) because they were calculated as ratios to the number of gainful workers enumerated on April 1, 1930.

The returns of the Philadelphia surveys are briefly summarized in Appendix Table X and Table 18.

² *Recent Trends in Employment and Unemployment in Philadelphia*, pp. 48, 51; Fifteenth Census of the United States: 1930, Unemployment, Vol. II, pp. 371, 384.

³ Classes A and B unemployed in per cent of the number of gainful workers enumerated on April 1, 1930.

⁴ The monthly index of employment in Philadelphia manufacturing industries was 76.5 in January 1931; 77.6 in February; 77.1 in March; 78.4 in April; 78.1 in May.

TABLE 18. COVERAGE OF THE LABOR MARKET SURVEYS IN PHILADELPHIA, 1931 TO 1938

Years	Canvassed families			Gainful workers ^a		Percentage of	
	Total	With gainful workers	With unemployment	Total	Unemployed ^b	Families with unemployment (Q)	Unemployed workers (q)
1931	36,410	35,592	11,751	67,150	17,141	33.0	25.5
1932	35,471	34,606	17,550	66,854	28,185	50.7	42.2
1933	35,820	34,886	18,694	66,454	30,568	53.6	46.0
1935	43,997	42,158	17,368	78,524	25,910	41.2	33.0
1936	44,817	42,488	17,035	80,841	24,067	40.1	29.8
1937	45,927	43,406	14,447	79,606	19,457	33.3	24.4
1938	45,715	43,053	17,707	75,402	24,530	41.1	32.5

^a 1931 to 1933, includes persons not seeking work because of temporary illness. These were not counted as employables after 1935. They numbered 258 in 1935, 1,019 in 1936, 640 in 1937.

^b Including emergency workers.

Sources: *Recent Trends in Employment and Unemployment in Philadelphia*, p. 46, *Employment and Unemployment in Philadelphia in 1936 and 1937*, Part I, pp. 10, 17; Part II, pp. 9, 13, *Employment and Unemployment in Philadelphia, July-August 1938*, pp. 6, 7.

VARIATIONS IN THE NUMBER OF WORKERS PER FAMILY

The distribution of canvassed families by number of gainful workers varied appreciably from year to year. (See Appendix Table X-A.) With the changing proportion of one-worker and multi-worker families, the number of workers per family (m) varied as follows: ⁵

	1931	1932	1933	1934	1935	1936	1937	1938
$m =$	1.89	1.93	1.90	—	1.86	1.90	1.83	1.75

The number of workers per family increased in the first phase of the depression, reaching a high point in 1932, and declined with improving employment conditions after 1936. In 1938, 180 fewer gainful workers were reported in each 1,000 families than in 1932, and this difference can hardly be explained by the exclusion of persons temporarily not seeking work because of illness.

The correlation between (m) and the severity of unemployment in the consecutive phases of the depression is obvious, although the influence of business conditions on the number of family members seeking work was necessarily overlapped by other factors, such as variations in the coverage of the sample, relief conditions, etc. ⁶

⁵ After 1935, excluding persons temporarily disabled by illness. (Source: Table 18.)

⁶ The Philadelphia Committee for Unemployment Relief set up records for 8,722 persons employed at made-work in 1931. Among other questions on their schedule, each emergency worker was asked: "How have you and your family

PROPORTION OF FAMILIES WITH UNEMPLOYMENT

The percentage rates (Q) and (q) in the last two columns of Table 18 are similar to those provided by the unemployment censuses in 1915, and may be interpreted in the same way.⁷ With the help of Appendix Table VI, it is found that the following percentages of unemployment among workers (q') would correspond to the reported size of families (m) and the proportion of families with unemployment (Q):

	1931	1932	1933	1935	1936	1937	1938
$q' =$	19.8	32.9	36.0	26.0	25.6	20.9	27.3

The surplus of the returned unemployment rate (q) over the theoretical rate (q') shows the concentration of unemployment in the same families, or the probable rate of additional jobseekers in households with unemployed usual breadwinners, in per cent of all workers:⁸

Years	Estimated excess of the unemployed	
	In per cent of all gainful workers ($q-q'$)	In per cent of the unemployed $100\left(\frac{q}{q'}-1\right)$
1931.....	5.7	22.3
1932.....	9.3	22.0
1933.....	10.0	21.7
1935.....	7.0	21.2
1936.....	4.2	14.1
1937.....	3.5	14.3
1938.....	5.2	16.0

In other words, the visible concentration of unemployment by families in Philadelphia might be accounted for by the entry of

managed to get along during the period of unemployment?" A list of possible ways was tentatively established by the Committee, and the respondent checked the ways used by his family. The first on the list was "Others Working," which might refer to those additional workers who were employed. The prominent place given in the schedule to this way of getting along should have induced the respondents to check it in preference to other questions. However, only 8.6 per cent (7.6 per cent of white and 11.0 per cent of colored) reported "Others Working." (Ewan Clague and Webster Powell, *Ten Thousand Out of Work* [Philadelphia: University of Pennsylvania Press, 1933], pp. 52, 143.) This indicates that in 1931 there were already additional workers in Philadelphia families with usual earners out of work, but the ratio of the number of forced entries to the whole working population was not very large at this early phase of the depression.

⁷ See Appendix Table VII.

⁸ Calculated as explained in Chapter XI.

additional jobseekers into the labor market at a rate of approximately 1 per 4 or 5 unemployed usual workers in the first phase of the depression, and at a rate of 1 per 6 or 7 in its more advanced phase.

PROPORTION OF ONE-WORKER AND MULTI-WORKER FAMILIES WITH UNEMPLOYMENT

As explained in Chapter XI, the entry of additional workers results in a characteristic disparity in the unemployment rates in one-worker and multi-worker households. The unemployment rates varied in Philadelphia as follows: ⁹

Years	Per cent of unemployed among gainful workers	
	All families (A)	One-worker families (B)
1931.....	25.5	16.7
1932.....	42.1	29.7
1933.....	46.0	33.6
1935.....	33.0	24.1
1936.....	29.8	23.7
1937.....	24.4	20.9
1938.....	32.5	26.5

Using the disparity between the unemployment rates (A) and (B) as an indicator of the probable extent of "secondary" unemployment,¹⁰ the following distribution of unemployment in Philadelphia is found:

Years	Estimated primary unemployment		Estimated secondary unemployment		
	Per cent of usual workers (r)	Per cent of all gainful workers (R)	Per cent of primary unemployment (s)	Per cent of usual workers (rs)	Per cent of all gainful workers (S)
1931.....	21.4	20.3	26.1	5.6	5.3
1932.....	36.6	33.4	26.5	9.7	8.8
1933.....	40.4	36.6	25.5	10.3	9.3
1935.....	28.8	27.1	21.6	6.2	5.8
1936.....	26.8	25.6	16.2	4.4	4.2
1937.....	22.7	22.2	10.0	2.3	2.2
1938.....	29.6	28.4	14.4	4.3	4.1

⁹ *Recent Trends in Employment and Unemployment in Philadelphia*, pp. 44, 46; *Employment and Unemployment in Philadelphia in 1936 and 1937*, Part II, pp. 9, 13, *Employment and Unemployment in Philadelphia, July-August 1938*, p. 7.

¹⁰ See Chapter XI, pp. 131-35.

The numbers in the last column (S) agree fairly well with those deduced from the visible concentration of unemployment by families (see page 176), although the two calculations were made independently and rest partly on different assumptions.

Both computations suggest that the peculiar distribution of unemployment by families in Philadelphia might result from the entry of additional workers during the depression; that in 1933 the labor supply in canvassed areas was inflated approximately 10 per cent; and that since 1936 the number of additional workers varied around 4 to 5 per cent of all gainful workers.

INTERPRETATION OF THE PHILADELPHIA LABOR MARKET STATISTICS FOR 1938

The report on employment and unemployment in Philadelphia in July-August 1938 stressed the disparity between the unemployment rates in one-worker and multi-worker households:

“Although the rate of unemployment is higher for employable members of multiworker as opposed to single-worker households, the rate of unemployment for household heads is higher in single-worker households, where for the most part the household head is the only employable member. There is preliminary evidence that the rate of unemployment of other household members bears a close relationship to the employment and unemployment of the household head.”¹¹

The authors of the report found the evidence of this close relationship in the specific unemployment rates computed for supplementary family members in households classified by the employment status of the head.

(See Table 19.)

It should be noticed that of a total of 43,053 families with gainful workers in 1938 (as shown in Table 18 and Appendix Table X-B), only 20,177 (19,460 multi-worker and 717 one-worker households in which family head was not employable) are included in Table 19, and that of a total of 75,402 employable persons, this table covers only 52,526 (18,984 family heads and 33,542 other family members). However, additional workers in the canvassed

¹¹ *Employment and Unemployment in Philadelphia, July-August 1938*, p. 9.

TABLE 19. EMPLOYMENT STATUS OF MEMBERS OF FAMILIES CLASSIFIED BY THE EMPLOYMENT STATUS OF THE HEAD, IN PHILADELPHIA, 1938

Employment status of the family head	Families	Other gainful workers by employment status			
		Total	Employed	Unemployed	Unemployment rate in per cent
Total	20,177	33,542	19,168	14,374	42.9
Employed	14,730	24,535	15,217	9,318	38.0
Unemployed	4,254	7,036	2,859	4,177	59.4
Unemployable	1,193	1,971	1,092	879	44.6

Source: *Employment and Unemployment in Philadelphia, July-August, 1938*, p. 9.

families would certainly come not only from multi-worker families but partly also from the former one-worker households. According to the estimate that additional workers in 1938 constituted 4.1 per cent of all gainful workers, their number in the canvassed families is likely to amount to 3,090 (4.1 per cent of 75,402), and 1,060 among them would have emerged from families which formerly had had only one worker but are classified in Table 19 among the 4,254 multi-worker households with the head unemployed. Without these 1,060 families, the number of families with unemployed heads is reduced to 3,194, the number of gainful workers other than the head in these families drops from 7,036 to 5,976, and the number unemployed among them from 4,177 to 3,117. The unemployment rate among family members other than the head, in this group of households, would be not 59.4 per cent but 52.2 per cent.

In order to visualize what happened in families in which there were usual earners other than the family head, it should be remembered that the total number of employable members (other than the head) in these families is supposed to be 32,482 (33,542—1,060), and among them 13,314 were supposedly out of work. This last number includes 2,030 additional workers. Without them, the average unemployment rate among usually working family members (other than the head) would amount to 35.8 per cent (11,284÷31,512). Assuming that this primary unemployment was distributed evenly among employable family members, it appears that there were approximately 380 additional job-seekers in families with the head employed and some of the other usual family earners out of work, 1,430 in families with the head unemployed, and 220 in families with the head not seeking work

and other usual family earners unemployed. This would suggest that the unemployment of the main earner in a family is more likely to provoke forced entries into the labor market than is the unemployment of a supplementary earner. In other words, new assumptions are necessary in order to explain the distribution of unemployment by families. But there is no contradiction between them and the assumptions used originally, and the Philadelphia unemployment statistics seem to be in perfect alignment with the theory of additional workers.

The interpretation of the Philadelphia unemployment rates suggested in the present volume occurred to the writers of the Philadelphia report, but was rejected by them.

“There is the further possibility,” they said, “that the unemployment of the chief wage earner in a family usually results in the entrance of a new worker or the reentrance of another worker into the labor market. This seems unlikely to be the case in Philadelphia, however, since there is no difference between the average number of employable persons (including new workers) in households in which the chief wage earner is employed and those in which he is unemployed.”¹²

The theory that the unemployment of the principal earner would “usually” result in the entrance of a new worker into the labor market is of course unrealistic. In many families there are no adult members not already in the labor force, in others the adult members who are not engaged in gainful pursuits may be kept home by family responsibilities. It can only be stated that in a part of the families in which the usual breadwinners are unemployed, some family members may shift to gainful work. Observations indicate that these shifts usually occur at a rate of 1 new worker per 8 or 10, and in exceptional cases 1 per 4 or 5, unemployed usual workers. This is precisely what the Philadelphia labor market surveys have shown. The 1938 statistics presented in Table 19 suggest, for example, that after the exclusion of the 1,060 families with supposedly only one usual earner,¹³ the number of employable persons per multi-worker family was :

In families with the head employed $(39,265 \div 14,730) = 2.66$
 In families with the head unemployed $(9,170 \div 3,194) = 2.87$

¹² *Employment and Unemployment in Philadelphia, July-August 1938*, p. 9.

¹³ See page 179.

THEORETICALLY PROBABLE DISTRIBUTION OF FAMILIES BY
EMPLOYMENT STATUS

"The incidence of unemployment in Philadelphia is not random," states their 1938 report. "There are consistently more households where all members are employed and more where all members are unemployed than there should be according to the laws of chance."¹⁴

To obtain the chance distribution of unemployment in households, the report combined in binomial distribution the general rates of employment and unemployment for all employable persons in each size-class of families. Two methods were used: method (A) applied the same employment and unemployment rates (0.674677 and 0.325323) to all families, while method (B) used specific rates for each size-group of households. Both resulting distributions were found to be in striking contrast with the statistical returns. However, the returned distributions may be explained without the theory of differential unemployment rates.

An estimate of the probable distribution of families by employment status should be based on the segregation of canvassed families by the probable number of usual breadwinners (excluding additional jobseekers). The method suggested in Chapter XI for ascertaining this segregation gives the following distribution of the total of 43,053 households by number of usual workers:

With 1 usual worker	24,653 (instead of 23,593)
With 2 usual workers	11,093 (instead of 11,238)
With 3 usual workers	4,698 (instead of 5,055)
With 4 usual workers	1,792 (instead of 2,077)
With 5 usual workers or more.	817 (instead of 1,090)

Assuming that the rate of primary unemployment among usual workers in canvassed families (r) was 29.6 per cent,¹⁵ the probability of being completely employed, if there was an even distribution of unemployment, was:

For families with 1 usual worker	$(1-r) = 0.704$
For families with 2 usual workers	$(0.704)^2 = 0.496$
For families with 3 usual workers	$(0.704)^3 = 0.349$, etc.

The probability of families in the same size-classes being completely unemployed was respectively 0.296, $(0.296)^2$ or 0.088,

¹⁴ *Employment and Unemployment in Philadelphia, July-August 1938*, p. 9.

¹⁵ See page 177.

(0.296)³ or 0.026, etc. Applying these probability coefficients to families with the specified number of usual breadwinners, it is found that, without additional jobseekers, they would be distributed by employment status as follows:

	Number of usual workers				
	1	2	3	4	5
Number of families					
Total	24,653	11,093	4,698	1,792	626
Completely employed	17,356	5,501	1,639	440	106
Partly unemployed	—	4,616	2,937	1,338	519
Completely unemployed	7,297	976	122	14	1
Percentage distribution of families					
Total	100.0	100.0	100.0	100.0	100.0
Completely employed	70.4	49.6	34.9	24.6	16.9
Partly unemployed	—	41.6	62.5	74.6	82.9
Completely unemployed	29.6	8.8	2.6	0.8	0.2
Number of unemployed workers					
In partly unemployed families..	—	4,616	3,807	2,164	902
In completely unemployed families	7,297	1,952	366	56	5

This pattern is decidedly different from the distribution returned by the labor market survey. However, the contrast is to a large extent due to the fact that the entry of additional workers from families with unemployed usual earners has not been taken into account. If allowance is made for the additional jobseekers, the difference largely disappears.

Assuming that the new workers entered the labor market at a rate of 4.3 per 100 usual earners,¹⁶ there will be 1,060 new jobseekers in former 1-worker families, 915 in former 2-worker families, 558 in former 3-worker families, 273 and 115 in former 4 and 5-worker families, all the families with new jobseekers being transferred into the next higher size-class. Assuming, further, that the entry of additional workers in a completely unemployed family is twice as probable as in a household which has lost only a part of its usual earnings, the following theoretically probable distribution of families by number of gainful workers (including additional jobseekers) and employment status is found:¹⁷

¹⁶ Which is the same as the rate of 4.1 per cent of all enumerated employable persons.

¹⁷ Estimated according to the method described in Chapter XI.

Number of workers in the family	Total	Completely employed	Partly unemployed	Completely unemployed
<i>Absolute numbers</i>				
1.....	23,593	17,356	—	6,237
2.....	11,238	5,501	4,107	1,630
3.....	5,055	1,639	2,961	455
4.....	2,077	440	1,566	71
5.....	784	118	655	11
<i>Percentage</i>				
1.....	100.0	73.5	—	26.5
2.....	100.0	48.9	36.7	14.4
3.....	100.0	32.4	58.6	9.0
4.....	100.0	21.2	75.3	3.5
5.....	100.0	15.1	83.5	1.4

This theoretical distribution of families by employment status differs but slightly from that shown in Appendix Table X.

The remaining minor disparities may be explained by the composition and economic level of the particularly large families. Besides, these disparities might be further reduced by an adjustment of the assumptions on which the computation of the theoretical distribution is based.

Similarly, the visible disparities in the unemployment rates for "first," "second," "third," and further workers in canvassed Philadelphia families may be explained or reduced to slight deviations from the theoretical pattern.¹⁸

¹⁸ See Note 2 in the Appendix, "Differentiated Rates of Unemployment for the 'First,' 'Second' and Other Workers in Families."

CHAPTER XVI

ADDITIONAL WORKERS BY TYPE OF FAMILIES

(Winter of 1935-36)

THE RETURNS OF THE Family Composition Study of the Social Security Board, examined in this chapter, show the correlation between the number of gainful workers and the employment status of the heads in families with the same number of adult members, i.e., with the same reserves of manpower. Consequently, these statistics answer directly the question of additional workers.

The Family Composition Study was a continuation of the National Health Survey taken in the winter of 1935-36 by the United States Public Health Service. About 800,000 households including 2,800,000 individuals were canvassed by means of a schedule which contained not only questions on disease, disabling illness, doctors' calls, etc., but likewise general inquiries on the composition of the family, its income, housing conditions, the occupation and employment status of its members. Since not all of this information was used in the original reports, the Public Health Service turned the completed schedules over to the Social Security Board for further analysis.¹

The term "family" as used by the Health Survey and the Family Composition Study has a narrower meaning than in the 1930 census reports. It refers not to the economic family (household) but to "biological" families comprising "(a) one or both spouses and their unmarried children, if any, including adopted or foster children, living together as a family unit; or (b) unmarried sisters and/or brothers, including adopted or foster brothers and sisters, living together as a family unit; or (c) persons living in extra-familial groups, as here defined, or by themselves, who are considered as separate one-person families."² Families of different

¹ Three volumes have been published: Federal Security Agency, Social Security Board, *Statistics of Family Composition in Selected Areas of the United States*, Vol. I, Detroit (May 1941); Vol. II, Boston (June 1941); Vol. III, Buffalo (December 1941). A series of articles on the study appeared in the *Social Security Bulletin* in 1939, 1940 and 1941.

² *Social Security Bulletin*, April 1939, pp. 12-13.

types are cross-classified by number of adults (16 years and over), number of earners, and employment status of the family head and other family members. Ten kinds of "employment status" are reported: (1) employed, (2) on work relief, (3) seeking work, (4) disabled, (5) housewife, (6) in school (regular), (7) at home, (8) retired, (9) in an institution, and (10) unknown. In the present analysis, groups (2) and (3) are counted together as unemployed, while groups (4) to (9) are counted as unemployable.

The Health Survey recognized that its definition of unemployment was not as clear as that of employment. "While the state of being employed may be determined with reasonable accuracy in accordance with arbitrary standards, . . . the state of seeking work or of willingness to work is much less tangible, for, in all probability the intensity of the seeking or the willingness varies from time to time. It is entirely possible that this intensity of seeking work may be directly related to the nature of the survey and its emphasis on unemployment."³ The report suggests, however, that since the primary emphasis of neither the Health Survey nor the 1930 Census of Population was on unemployment, they should be comparable on the score of intensity.

The greatest disparity between the Public Health Survey and the 1930 census was in the manner of counting and classifying married women seeking work; they were reported as unemployed by the census but not by the Health Survey.

"Both schedules called for an entry denoting employment status and both required the entry of a suitable symbol designating homemakers. On the 1930 Census schedule these entries were made in different columns so that the homemaker could also be a worker or a work-seeker. This was not the case on the Health Survey schedule which provided only one column and which required the enumerator and the informant to decide whether the individual being enumerated was a homemaker or a worker (including work-seeker). While enumerators were instructed to enter as workers all who were engaged in gainful work or seeking work, it is entirely possible that many or even most enumerators felt there should be a homemaker in all or nearly all families although the instructions gave no indication that

³ U. S. Public Health Service, *Characteristics of the Urban Unemployed* (Preliminary Bulletin D, 1938), p. 8. In the opinion of the present writer, the variable is not the "intensity of seeking work" but the way in which this intensity is recorded by the survey.

such need be the case. The existence of this situation would operate to reduce the number of women seeking work . . .”⁴

Use of the unemployment figures of the Family Composition Study therefore requires the following restriction: As far as unemployed male workers (“seeking work” or “on work relief”) are concerned, they are comparable to the unemployment figures of other enumerations; but the number of unemployed women is understated in the Family Composition Study because most of the unemployed married women were tabulated as “homemakers.” The following analysis is restricted to a selected sample of cities. Of the 10 large cities for which tables have been computed (New York, Chicago, Philadelphia, Detroit, Los Angeles, St. Louis, Cleveland, Baltimore, Boston, and Buffalo), only two cities, Detroit and Boston, are examined here in some detail, while the findings of an identical analysis for the other 8 cities are more briefly summarized.⁵

DISTRIBUTION OF FAMILIES BY SIZE AND BY EMPLOYMENT STATUS OF THE FAMILY HEAD

The families canvassed by the National Health Survey in Detroit and Boston were distributed by employment status of the family head as follows:⁶

Employment status of family head	Number of families	
	Detroit	Boston
Total	27,872	39,621
Employed	20,984	24,099
Unemployed (incl. those on work relief)	3,056	5,819
Unemployable	3,832	9,703

The total number of gainful workers (employed or not) in canvassed families was 32,868 in Detroit and 46,860 in Boston. The average number of gainful workers per family (1.18 in both cities) is remarkably small in comparison with the returns of the

⁴ *Ibid.*

⁵ When this report was written, only the Detroit and Boston statistics were available. However, a check of the findings with the unpublished data for the other 8 cities showed that, so far as the entry of additional workers was concerned, the conditions in Detroit and Boston were typical for the other cities covered.

⁶ Cf. Appendix Table XI-A. Families with the employment status of the head unknown are excluded.

TABLE 20. AVERAGE NUMBER OF GAINFUL WORKERS IN FAMILIES CLASSIFIED BY NUMBER OF ADULTS AND THE EMPLOYMENT STATUS OF THE HEAD, IN DETROIT AND BOSTON, 1935-36

Number of adults in the families (including the head)	Employment status of the head		
	Employed	Unemployed	Unemployable
DETROIT			
All families.....	1.26	1.44	0.52
1.....	1.00	1.00	—
2.....	1.12	1.15	0.60
3.....	1.59	1.76	1.44
4.....	2.24	2.51	2.18
5.....	3.03	3.44	2.81
BOSTON			
All families.....	1.36	1.48	0.57
1.....	1.00	1.00	—
2.....	1.12	1.14	0.58
3.....	1.69	1.80	1.47
4.....	2.44	2.57	2.29
5.....	3.24	3.33	3.10

Source: Appendix Table XI-B.

1930 census, but it should be kept in mind that the family units of the survey were not "households" as this term was used by censuses, but "biological" families.

The distribution of families by the employment status of the head, number of adults, and number of gainful workers is shown in Appendix Table XI-A. Table 20 shows the number of gainful workers in families of different sizes.

The first adult in a family is almost always the family head; the second adult is usually the housewife. As already pointed out, the proportion of wives engaged in gainful work is understated in the Public Health Survey, and it is certain that the average number of workers in 2-adult families (especially in families with unemployed heads) was considerably larger than shown in Table 20. The third, fourth and fifth adults are most frequently grown sons or daughters of the family head. Table 20 shows significant differences in their work status in families classified by the employment status of the head.

NUMBER OF SUPPLEMENTARY WORKERS PER FAMILY, BY THE EMPLOYMENT STATUS OF THE HEAD

The correlation between the number of supplementary workers per family and the employment status of the head becomes clearer

if the tabulation is restricted to adult earners other than the family head, as shown below: ⁷

Number of adults in the family (incl. the head)	Average number of earners, other than the head, in families with the head		
	Employed	Unemployed	Unemployable
Detroit			
2.....	0.12	0.15	0.60
3.....	0.59	0.76	1.44
4.....	1.24	1.51	2.18
5.....	2.03	2.44	2.81
Boston			
2.....	0.12	0.14	0.58
3.....	0.69	0.80	1.47
4.....	1.44	1.57	2.29
5.....	2.24	2.33	3.10

In families with the given number of adults, the number of earners other than the family head increased in both cities if the head was unemployed, and especially if he was unemployable. The forced entry of second adults is not properly reflected in this tabulation because most of the housewives searching for jobs are omitted. The proportion of gainful workers among third adults varied with the employment status of the head as follows:

Employment status of the family head	Percentage of earners among third adults ⁸	
	Detroit	Boston
Employed	47	57
Unemployed	61	66
Unemployable	84	89

This indicates the following rates of forced entries (in per cent of third adults who are *not* part of the labor force as long as the family head remains employed):

Employment status of the family head	Percentage of forced entries ⁹	
	Detroit	Boston
Unemployed	26	21
Unemployable	70	74

⁷ See Table 20.

⁸ Calculated as the excess of the number of gainful workers per family with 3 adults, over the respective number for families with 2 adults. For families with employed heads in Detroit, for example, the rate of 47 per cent is found as the difference 0.59 - 0.12, taken from the tabulation at the top of this page.

⁹ Calculated as the ratio of the increment in the number of third adult family members in the labor force, to the number of third adults who presumably would not be in the labor force if the family head were employed. The preceding tabulation shows, for example, that in Detroit 47 per cent of third adults in families with employed heads are in the labor force, and 61 per cent in families with unemployed heads. The percentage of forced entries is determined

as the ratio $\frac{61-47}{100-47} = 0.26$.

For fourth adults, the comparable rates are :

Employment status of the family head	Percentage of earners among fourth adults ¹⁰	
	Detroit	Boston
Employed	65	75
Unemployed	75	77
Unemployable	74	82
	Percentage of forced entries ¹¹	
Unemployed	29	8
Unemployable	26	28

The number of gainful workers per family with the head unemployed was larger than the number per family with the head employed by 0.18 in Detroit and by 0.12 in Boston (without housewives forced into the labor market).¹²

EMPLOYMENT STATUS OF ADDITIONAL WORKERS IN FAMILIES WITH UNEMPLOYED HEADS

If supplementary workers in families of different sizes are segregated by employment status (as in Appendix Table XI-B), it is found that the number of employed family members does not increase consistently in families with unemployed heads. Rather the increase is in the number of family members seeking jobs. The following tabulation shows the number of employed and unemployed supplementary workers (other than wives) per 100 families with employed and unemployed heads :

Number of adults in the family	In families with employed heads Supplementary workers			In families with unemployed heads Supplementary workers		
	Total	Employed	Unemployed	Total	Employed	Unemployed
Detroit						
2.....	2.2	1.7	0.5	4.8	3.2	1.6
3.....	54.4	40.8	13.6	73.2	44.8	28.4
4.....	121.0	89.2	31.8	149.1	87.8	61.3
5.....	200.7	150.0	50.7	240.9	140.9	100.0
Boston						
2.....	5.3	4.0	1.3	6.5	2.9	3.6
3.....	66.0	43.6	22.4	76.3	29.5	46.8
4.....	141.2	92.2	49.0	154.5	62.3	92.2
5.....	221.6	142.5	79.1	230.8	102.6	128.2

¹⁰ Calculated as explained in footnote 8.

¹¹ Calculated as explained in footnote 9.

¹² Question may be raised as to whether the same number of adults indicates that families had equal labor reserves. It may be argued, for example, that some of the households with unemployed heads had many children, and therefore the large number of gainful workers in comparison with the number of adults in these households was accounted for by the working children. This explanation should be discarded in view of the fact that the Public Health Survey reported practically no gainful workers under 16 years of age.

It is likely that in most cases additional workers forced into the labor market compete for work opportunities mainly with individuals of the same sex and age who are usual gainful workers. If the number of unemployed family members increases while the number of employed family members remains steady, this does not mean that none of the forced entrants succeeded in his search for a job. It suggests only that most of those who found jobs did so at the expense of other supplementary workers.

UNEMPLOYMENT RATES BY SIZE OF FAMILY

Since not only the unemployment of the family head but likewise the layoff of other usual breadwinners may force additional workers into the labor market, they may be found also in families with employed heads. Therefore, the actual unemployment rate among supplementary workers in all groups of families must be higher than among family heads, and it is likely that this rate will increase with the number of supplementary workers per family. This general statement hardly requires elaboration. The correlation between the unemployment rate and the size of family measured by the number of adults, however, is not so simple.

In Detroit and Boston, the proportion of unemployed family heads was comparatively high in the group of families with only 1 adult, dropped to the low point in 2-adult families, and increased in larger families, as follows: ¹³

Number of adults in the family	Percentage of unemployed family heads	
	Detroit	Boston
1.....	16.5	19.1
2.....	9.6	13.4
3.....	15.5	19.8
4.....	16.8	22.6
5.....	21.8	24.1
6 or more	29.6	27.9

This is probably accounted for by the correlation between the number of adults in the family and the age of the head. Among heads of families with only 1 adult, there were many young workers with comparatively high unemployment rates. Most of the heads of families with 2 adults belonged in the age-classes under 40 years with the lowest unemployment rate. Many of the family heads

¹³ Families with unemployable heads are excluded. See Appendix Table XI-A.

with several adult children were in the age groups in which work opportunities are likely to diminish.

The relationship between the unemployment rates among supplementary workers and the employment status of the family head may be established either for families with the same number of adults, or for families classified by number of gainful workers. The results are essentially the same: in all classes of families, unemployment rates are particularly high if the family head is out of a job. On the other hand, unemployment seems to be of approximately equal severity in families with 3, 4 or 5 adult members. The unemployment rates among supplementary workers, other than wives, were as follows:

Number of adults in the family	Detroit		Boston	
	Employed	In families with the heads Unemployed	Employed	Unemployed
2.....	23.4	33.3	25.0	55.4
3.....	25.1	38.8	34.0	61.3
4.....	26.3	41.1	34.7	59.7
5.....	25.3	41.5	35.7	55.6

The following conclusions are drawn from the preceding analysis: (1) The unemployment rates among wives returned by the Family Composition Study are extremely low, and it is obvious that in large families wives seeking work were not returned as unemployed. (2) Unemployment rates among other supplementary workers were about the same in all size-groups of families. (3) These rates were about the same in families in which the head was employed and unemployable, and much higher in families in which the head was unemployed.

ADDITIONAL WORKERS IN TEN LARGE CITIES

The returns of the Family Composition Study for the other 8 large cities have been analyzed along the same lines as the Detroit and Boston statistics, and in all cases the same correlation has been found between the employment status of the family head and the participation of other family members in gainful work.

(See Table 21.)

In 1,000 families with 2 adults, there were only 128 supplementary workers if the family head was at work. The theoretical reserve of manpower in these families was therefore 872 persons.

TABLE 21. NUMBER OF SUPPLEMENTARY WORKERS BY THE EMPLOYMENT STATUS OF THE FAMILY HEAD IN 10 LARGE CITIES, 1935-36
(Number of employable family members other than the head, per 100 families)

City	Employment status of the family head		
	Employed	Unemployed	Unemployable
<i>Families with 2 adults</i>			
New York.....	11.3	13.3	58.8
Chicago.....	14.3	18.9	58.2
Philadelphia.....	17.8	24.6	59.3
Los Angeles.....	14.1	15.7	45.7
Detroit.....	12.0	15.0	60.0
Boston.....	12.0	14.0	58.0
Buffalo.....	9.3	10.5	60.9
Cleveland.....	14.1	14.9	55.6
St. Louis.....	16.7	22.3	62.8
Pittsburgh.....	6.7	7.9	56.5
UNWEIGHTED AVERAGE.....	12.8	15.7	57.6
<i>Families with 3 adults</i>			
New York.....	66.0	78.8	146.1
Chicago.....	67.2	76.6	146.6
Philadelphia.....	76.7	92.5	151.3
Los Angeles.....	53.0	67.4	123.6
Detroit.....	59.0	76.0	144.0
Boston.....	69.0	80.0	147.0
Buffalo.....	66.5	78.8	150.7
Cleveland.....	68.5	74.7	142.6
St. Louis.....	72.6	83.1	147.5
Pittsburgh.....	59.1	68.3	138.2
UNWEIGHTED AVERAGE.....	65.8	77.6	143.8
<i>Families with 4 adults</i>			
New York.....	141.9	160.9	225.5
Chicago.....	141.0	154.1	222.1
Philadelphia.....	154.0	178.0	238.2
Los Angeles.....	100.3	118.1	209.2
Detroit.....	124.0	151.0	218.0
Boston.....	144.0	157.0	229.0
Buffalo.....	136.6	154.5	234.5
Cleveland.....	135.9	151.6	225.3
St. Louis.....	144.8	170.6	232.5
Pittsburgh.....	127.0	138.5	221.9
UNWEIGHTED AVERAGE.....	134.9	153.4	225.6

Source: Computed from the original tabulations of the Family Composition Study, by courtesy of the Bureau of Research and Statistics of the Social Security Board.

It appears that the unemployment of the family head would have forced into the labor market 29 additional workers (157-128) or 3.3 per cent of the theoretical reserve. This rate is obviously understated because of the omission of housewives searching for jobs. The magnitude of the underenumeration may be estimated as follows.

In 1,000 families with 3 adult members and with the head employed, there were 658 working members, as compared with 128 supplementary workers in the 1,000 families with 2 adult members, the surplus amounting to 530. It appears therefore that of 1,000 third adults (or second adults other than the head) in families of this type, 530 were engaged in gainful work, while 470 were in reserve. Since the number of third adults employed or seeking work per 1,000 families of the same size with the heads out of jobs was 619 (776—157), it is likely that the unemployment of the head would have forced into the labor market 89 additional workers, or 17 per cent of the reserve.

For fourth adults, the following comparable figures are found: where the head is employed, 691 persons per 1,000 (1,349—658) are in gainful pursuits, and 309 are in reserve; while in the case of unemployed heads 758 (1,534—776) are working or looking for jobs. The number of forced entries in this case is 67, or 22 per cent of the reserve.

It appears that, on the average, the number of additional entries was near to 20 per cent of the available reserve of manpower measured by the number of adults who are not in the labor force when the family head is employed. It is not unlikely that the proportion of housewives entering the labor market after their husbands were laid off was not very far from this rate. Of course, it is a question of judgment whether to accept or reject this supposition. If it is accepted, the understatement of housewives among additional workers in families canvassed by the Public Health Survey would be estimated roughly at 20 per cent of the married unemployed family heads, or at 6 per cent of all unemployed workers.

The proportion of unemployed additional workers in the total unemployment figures returned for the 10 large cities seems to be close to 10 per cent, or, with the necessary allowance for error, it might have ranged from 8 to 12 per cent.

UNEMPLOYMENT IN THE UNITED STATES IN THE WINTER OF 1935-36

The volume of unemployment in urban areas was estimated in the report of the Public Health Survey at 6.6 millions—4.9 mil-

lion men and 1.7 million women.¹⁴ But because of the omission of married women seeking work, this number was probably understated by around 400,000. With this correction, the number unemployed in urban areas would be nearly 7 millions.

The volume of unemployed workers in rural areas varied from month to month during the enumeration. Assuming that the average unemployment rate in rural areas was slightly less than in cities, the probable total number unemployed in the United States at the time of the survey was 9.0 to 9.2 millions. Of this total, 8 millions were probably usual workers, and from 1 to 1.2 millions were forced into the labor market by the unemployment of the usual breadwinners in their families. Probably only 600,000 to 800,000 of the forced entrants were enumerated by the Public Health Survey.

¹⁴ *Characteristics of the Urban Unemployed*, p. 6.

CHAPTER XVII

VOLUNTARY REGISTRATION OF THE UNEMPLOYED IN NOVEMBER 1937

THE CENSUS OF PARTIAL EMPLOYMENT, UNEMPLOYMENT, AND OCCUPATIONS, carried out in November and December 1937, consisted of a voluntary registration of persons who wanted work (or more work) and an enumerative check census. A total of 7,845,016 persons registered during the week of November 14 to 20 as wanting work, and on the basis of the check census in December the number of unemployed workers was estimated at 10,983,000. At the first sight, only two explanations of the striking disparity between the two numbers seemed possible: either the voluntary registration was incomplete, with more than 3 million unemployed failing to fill out cards, or the check census data were overstated.

Serious objections arose against both explanations. It was known that the enumeration was very popular with unemployed workers, that they attached great importance to the registration, and that the returned cards were carefully filled out. It seemed improbable therefore that more than 3 million unemployed would disregard the registration. On the other hand, the excellent techniques used by the check census would seem to make a bias of this magnitude in its returns impossible.

It was suggested also that the disparity between the two figures might be accounted for by the shifts of workers into and out of the labor market. But this explanation would require two assumptions: first, that there was a group of more than 3 million persons who were not certain whether they wanted work or not; and second, that these workers for one reason or other did not register initially as unemployed, but did report their unemployment to the check census enumerators two weeks later. The soundness of both assumptions is open to question.

While, in view of present shortages of labor, it is no longer so important whether there were 8 or 11 million unemployed in November 1937, the question should be examined because of the

methodological problems involved. Voluntary registration is certainly the simplest and least expensive method of enumeration, provided its returns are reasonably complete and trustworthy. This method was tested on a large scale in November 1937 for the first time in the United States, and the results of the test have an important bearing on whether or not this procedure should be used again. It should not be considered if it is found that only 60 to 70 per cent of the unemployed made use of the record cards. It should be regarded as a reliable method if its initial test was reasonably accurate and complete.

In the following pages the totals returned by the voluntary registration are compared with several other direct enumerations, and it is found that the number of registrants was in perfect agreement with available information on the volume of unemployment in different phases of the depression. Further, the distribution of the registrants by work experience, industries, sex and age, and families is examined and checked with comparable data from other enumerations. It is found that the registration returns are internally consistent and give no indication of considerable omissions or misclassifications. After this double test, the specific conditions under which the check census was carried out are analyzed and its coefficients of incompleteness appraised. The conclusion is reached that the apparent contradiction between the two enumerations was due to the rapidly changing business conditions in the fall of 1937 rather than to the incompleteness and inaccuracy of the registration.

THE VOLUNTARY REGISTRATION AND ENUMERATIVE CHECK CENSUS

The report card used for the voluntary registration contained, besides the usual personal information, ten questions which may be segregated into three groups as follows :

Occupation :

Are you able to work?

What is your occupation or kind of work?

Kind of business or industry in which you did or are doing this kind of work?

Employment status :

Are you: (a) Totally unemployed and want work? (b) Partly employed and want more work? (c) Working at WPA, NYA, CCC, or other emergency work?

How many hours did you work last week?

How many weeks did you work in the last 12 months?

What was your individual total income, cash and other, last week?

Family conditions :

How many other workers are there in your family living in the same household with you?

How many of these workers are: (a) Totally unemployed and want work? (b) Partly employed and want more work? (c) Working at WPA, NYA, CCC, or other emergency work?

How many persons are mainly dependent on you for support?

The inquiry on occupation followed essentially the outline of the 1930 census, and its returns were tabulated in the same way. The other two inquiries, however, differed from the patterns used by the previous censuses. The queries on employment status emphasized the fact that the registrant "wanted work" or "more work." Whether these words meant exactly the same to the registrant as the traditional terms "seeking work" or "looking for work" is open to question. The new terms could have been interpreted in a broader sense, and it is possible that some persons whom a regular census would not count as unemployed were encouraged to register, especially as many may have regarded the registration as an application for work. Under these conditions, there was more reason to expect inflated returns than an incomplete registration.

The enumerative check census supplemented the returns of the voluntary registration in selected areas. A house-to-house canvass, conducted during the week of November 29 to December 4 along 1,640 postal routes by regular mail carriers, covered approximately 1.5 per cent of the population of the United States. The carriers used a family schedule, conveniently arranged with 12 columns and 1 line for each person 14 years of age or over.

Persons who reported to the carriers that they did not work during the week of November 14 to 20, but were able to work and actively seeking work at that time, were counted as unemployed. This definition of unemployment is apparently narrower than that of the registration. However, the term "actively seek-

ing work" was not defined and therefore it is conceivable that respondents might have regarded the declarations to the mail carriers as equivalent to an "active" search for work. It is not very clear also whether respondents were explicitly informed that they were supposed to report their status as of two weeks before and not that at the date of the check census.

This last point is of paramount significance in view of the change in business conditions which occurred between the voluntary registration and the check census.

BUSINESS CONDITIONS IN THE FALL OF 1937

The census was carried out in an early phase of the recession in the autumn of 1937 which suddenly interrupted the upward movement on the labor market. The Bureau of Labor Statistics index of factory employment for the last half of 1937 was as follows (average 1923-1925=100):

July	Aug.	Sept.	Oct.	Nov.	Dec.
108.0	109.1	109.0	107.2	101.1	94.5

In the two months from mid-October to mid-December, the index dropped 12.7 points, which corresponds to net losses in factory employment at a rate of 150,000 jobs weekly. The separation rate in manufacturing industries exceeded 8 per cent per month, or 200,000 men per week. The recession in factory employment coincided with seasonal layoffs in the building trades and particularly in agriculture. In all industries (including agriculture) about 2 million persons lost their jobs between mid-October and mid-November, and as many again from mid-November to mid-December 1937.¹ The exact distribution of separations by weeks is unknown, but it is fairly possible that they were heavily concentrated at the end of each month, so that the number of persons who were employed on November 15 and were unemployed on December 1 would not be far from 1.5 million.

It is hardly necessary to emphasize how unfavorable this development was for a census planned as two consecutive surveys, one checking the returns of the other.

¹ These numbers include part of the labor turnover and are therefore larger than the net change in total employment.

NUMBER OF REGISTRANTS

The voluntary registration reported that 7,845,016 persons were "unemployed and wanting work," and that 2,011,615 among them were emergency workers. It is fairly certain that not all registrants were "unemployed" in the sense in which this term was used by the 1930 census, and it is likewise certain that not all unemployed workers filled out report cards. The question is whether the net balance of opposing errors was of sufficient magnitude to distort appreciably the totals. In order to check this question, the returns of the registration are compared in the following pages with the returns of other enumerations of unemployment from 1930 to 1940.

Comparison with the 1930 census

Assuming in agreement with the estimates of the Bureau of Labor Statistics and the Department of Agriculture that the level of employment in November 1937 was about the same as on April 1, 1930, unemployment at the later date should equal the 1930 unemployment plus the net increase in the number of salary and wage earners.

It is estimated that the population of the United States increased between April 1930 and November 1937 by 6.8 millions. If the proportion of gainful workers in each sex and age group were the same in 1937 as in 1930, the number of gainful workers would have increased by 4,380,000 during the same period.² Assuming that 90 per cent of the net increase in gainful workers were salary and wage earners, their number should have increased by 3.9 to 4.0 millions, so that the number of unemployed workers in November 1937 should be about 7,065,000 or 7,165,000. The surplus of 700,000 to 800,000 in the returns of the voluntary registration might be explained by the entry of additional jobseekers.

Comparison with the Special Census of Unemployment in January 1931

Unemployment in November 1937 was less severe than in January 1931, the difference being estimated by Robert Nathan

² Leonard Kuvin, "Revised Estimates of Employment and Unemployment," *Bulletin of the National Industrial Conference Board*, May 24, 1937.

at 7 per cent. If unemployment in the 21 urban areas covered by the 1931 census diminished also at this rate, there would be from 1,850,000 to 1,900,000 individuals out of work in these areas in the week of the registration.³ The number of registrants, however, was 1,751,812, and the slight disparity may be accounted for by changes in the industrial and territorial distribution of the labor force and unemployment in the nation.

Comparison with the National Health Survey in the winter of 1935-36

On the basis of the returns of the National Health Survey and allowing for the underenumeration of housewives seeking work, unemployment in the winter of 1935-36 is estimated at 9.0 to 9.2 millions.⁴ Monthly estimates of unemployment agree that in November 1937 the number of unemployed persons in the nation was approximately 15 per cent under the average from November 1935 to March 1936. The number of persons who registered in November 1937 as wanting work was exactly 15 per cent less than 9.1 millions.

*Comparison with the Census of April 1, 1940*⁵

When comparing the returns of the voluntary registration of November 1937 with the data of the 1940 census, far-reaching differences in definitions and methods of classification should be kept in mind. Instead of asking whether each individual was or was not engaged in gainful work and segregating the gainful workers into two groups, employed and unemployed, the 1940 census used questions which were intended to describe the employ-

³ After excluding part-timers from Class B unemployed, the number unemployed in these areas in 1931 is estimated at 2.1 millions. See p. 166.

⁴ See p. 194.

⁵ As the final returns of the 1940 census were not yet available when this report was completed, it is premature to discuss in detail the fragmentary information on employment and unemployment released by the Bureau of the Census. More specifically, it is impossible to analyze the 1940 statistics from the angle of the theory of additional workers before the tabulations of the unemployed by duration of idleness, marital status, industrial affiliation, and the like are completed. The sole objective of the following observations is to check the returns of the voluntary registration with those of the 1940 census. If it is found that the totals of the two enumerations are in alignment, this will confirm not only the validity of the voluntary registration but also of other enumerations of unemployment which are in accordance with this registration.

ment status of the individual. These questions follow, with their numbers in the population schedule :

21. Was this person *at work* for pay or profit in private or non-emergency government work during week of March 24-30?
22. If not, was he at work on, or assigned to, public *emergency work* (WPA, NYA, CCC, etc.) during week of March 24-30?
23. Was this person *seeking work*?
24. If not seeking work, did he *have a job*, business, etc.?

These questions were to be answered "yes" or "no" by all enumerated persons 14 years old and over. The instructions to enumerators gave a wide interpretation of the concept "seeking work."⁶

In the tabulations on the employment status of persons 14 years of age and over, three main groups are distinguished: (1) employed (except on public emergency work); (2) on public emergency work (WPA, NYA, CCC, etc.); (3) seeking work (experienced and new workers). These groups together constitute the "labor force," and this concept is substituted for the "gainful workers" of previous censuses.⁷ In most of the tabulations, the term "unemployed" is not used. Although it is made clear by implication that the concept of unemployment should include persons tabulated as on public emergency work, plus those seeking work, this interpretation of the totals returned by the census was never officially adopted. Instead, in a statement dated April 25, 1941 which was prepared "to indicate the manner in which the data should be combined and interpreted to obtain summary statistics of unemployment during the Census week," the Bureau of the Census built up the number of unemployed as the sum of

⁶ Enumerators were instructed as follows: "Enter 'yes' for a worker . . . who was not actively seeking work because the plants or establishments in the community were shut down. . . . Enter 'yes' for a person without a job who would have been actively seeking work except for a temporary illness, such as a cold. . . . Enter 'yes' for a person who would have been actively seeking work except for the fact that there was no work to be had, or no work to be had at his occupation."

⁷ The Census Bureau stressed the difference between the two concepts. "Persons in the labor force are individuals who, at any time during the week of March 24-30, 1940, worked for pay or profit on private or non-emergency government work, or assisted without pay in a family enterprise; or who were on public emergency work; were temporarily absent from jobs, business or professional enterprises; or were seeking work during that week." On the other hand "gainful workers" as enumerated by the 1930 census were "persons usually following a gainful occupation, that is, an occupation in which the person earns money or a money equivalent, or in which he assists in the production of marketable goods."

persons returned by the census as seeking work plus those on the payrolls of federal emergency work agencies (as indicated in their official reports). Two alternative computations were developed, one including the NYA Student Work Program, and the other excluding it. The Bureau of the Census recommended the second set of figures as more satisfactory.

According to the preliminary reports of the census, 5,110,270 persons were seeking work in the week of March 24-30, 1940, including 796,695 new workers (who had not previously worked full time for one month or more at a single job). In addition, 2,380,062 persons were returned as employed on public emergency work. The last number was raised to 2,906,196 in order to agree with the totals of the payrolls of the respective emergency agencies, excluding the NYA Student Work Program, and the total number of unemployed in the census week was estimated at 8,016,466. Thus, in round numbers, the census reported 7.5 million persons either seeking work or employed on emergency projects, while the adjustment gave 8 millions.

The disparity between the official payrolls and the census returns for emergency workers, however, need not mean that the census returns were understated. Some persons who were employed part-time on emergency work projects but had additional earnings during the census week may have answered "yes" to question 21, while others who regarded their emergency employment as temporary may have reported that they were seeking work. It is therefore a question of judgment whether the adjustment made in the release of April 25, 1941 was necessary.⁸

There are, however, other arguments in favor of an upward revision of the unemployment figure returned by the 1940 census. The wording of question 21 tends to classify as employed persons who had been at work at any time during the week of March 24-30, even if they were laid off and seeking work the day before the

⁸ The official explanation of the disparity is given in the following footnote which accompanies the preliminary tabulations on employment status: "It is probable that the majority of those on the WPA, CCC, and NYA Out-of-School Program who were not properly classified in the census were returned as employed in private or non-emergency government work. The great majority of students on the NYA Student Work Program who were not properly classified were returned as in school." However, as every respondent at a census is supposed to be the best judge of his work and employment status and as it has not been proved that the respondents did not report according to their best judgment, there is no evidence that they were not properly classified in the census returns.

visit of the enumerators. Since workers who had lost their jobs during the census week were not counted as unemployed, the returned number of unemployed was understated in comparison with the pattern of the 1930 census. In addition, some of the unemployed might be classified in the group of persons with unknown employment status.⁹ The upward revision of the returned unemployment figure from 7.5 millions to 8.0 millions, suggested by the Bureau of the Census, takes care of both of these biases in the 1940 enumeration.¹⁰

Using the figure of 8.0 million unemployed in the last week of March 1940 as a bench mark, the volume of unemployment reported by the voluntary registration in November 1937 may be checked with the help of available information on changes in the labor force and employment between the two dates. For convenience, the time between the two enumerations is divided into two periods: from the end of November 1937 to March 1938, and from the end of March 1938 to the end of March 1940.

Changes in employment between November 1937 and March 1938 are reported by the Bureau of Labor Statistics and Department of Agriculture. According to the Bureau of Labor Statistics, the total non-agricultural employment declined from mid-November 1937 to mid-March 1938 by 2.2 millions.¹¹ This figure drops to approximately 2 million, if comparison is made not between the mid-monthly points but between the final weeks of the two months. The monthly indexes of agricultural employment, computed by the Department of Agriculture on the basis of reports of crop reporters, suggest that the number of employed farm laborers was approximately 100,000 higher on April 1, 1938 than on December 1, 1937. The natural growth of the labor supply during this time may be estimated at 200,000 and this brings the probable net increment of unemployment to 2.1 millions, without allowing for additional workers.

⁹ Nearly 1.8 million persons were tabulated in this group, but the Bureau of the Census points out that the preliminary evidence concerning the characteristics of these persons indicates that the great majority of them were not in the labor force. Women prevailed in this group and most of the men were either under 20 or 65 years of age and over.

¹⁰ It is estimated that from 300,000 to 350,000 newly separated workers were counted as employed, and that the number of unemployed persons reported with unknown employment status was 150,000 to 200,000.

¹¹ U. S. Bureau of Labor Statistics, *Estimates of Nonagricultural Employment*, April 1941 (mimeo.).

Variations in employment from April 1, 1938 to April 1, 1940 can be estimated with greater accuracy on the basis of the records of the Bureau of Old-Age and Survivors Insurance. In accordance with the employers' quarterly reports to the Treasury, the actual number of workers employed by covered establishments is estimated by the Old-Age Bureau at 23 millions in the last pay period of March 1938 and at 26.3 millions in the last pay period of March 1940, so that in March 1940 covered employment was 3.3 millions more than at the same date in 1938.

To some extent the increase was due to the 1939 amendments to the Social Security Act, which extended old-age and survivors insurance taxes to approximately 400,000 persons of 65 and over employed by covered establishments, to about 200,000 employees of state banks, and over 100,000 maritime workers. On the other hand, since certain establishments (with an estimated employment of 200,000) were excluded from coverage, the net increase of employment in all industries covered by old-age and survivors insurance may be estimated at 2.8 millions (in round numbers).

At the same time, the number of civil employees of federal, state and local governments increased from 3.6 to 3.7 millions, the Army and Navy augmented their personnel from 330,000 to 461,000, and railroad employment increased from 1,077,000 to 1,156,000. Assuming in agreement with the Bureau of Labor Statistics that there were no appreciable changes in employment in domestic service, casual jobs and independent pursuits, and that the demand for labor by agriculture in March-April 1940 was about the same as two years before, the total increase of employment from the end of March 1938 to the same date in 1940 is estimated at 3.1 millions. Since the supply of labor might increase in the two years by 1.0 to 1.2 millions, it is likely that unemployment declined during the same time by 1.9 to 2.1 millions.

Without allowing for the entry and withdrawal of additional workers, the total number of unemployed as defined by the 1940 census would vary as follows, in round numbers: ¹²

	In millions
End of March 1940 (Bureau of the Census).....	8.0
End of March 1938 (1.9 to 2.1 millions more than at end of March 1940)	9.9 to 10.1
End of November 1937 (2.1 millions less than at end of March 1940) ..	7.8 to 8.0

¹² If the probability that additional workers entered the labor force is taken into account, the estimated figure for the end of March 1938 should be increased by

The last figure agrees perfectly with the returns of the voluntary registration.

To sum up, the totals of the voluntary registration appear to be in complete accord with the data of the 1930 census, the special unemployment census in January 1931, the National Health Survey in the winter of 1935-36, and the 1940 census. Their agreement is the more remarkable in view of the diversity of definitions and methods used, and is explained by the fact that they approached the problem in a similar way. In order to ascertain the number of unemployed in a household, each individual was given the opportunity to express his understanding of his own work and employment status. Although the five enumerations worded their questions differently, their meaning to the respondents was apparently the same.

All in all, it seems that the voluntary registration was approximately as complete as the regular censuses of unemployment, and that its totals include additional workers in about the same proportion as the census of 1940.

DISTRIBUTION OF REGISTRANTS

Another check of the reliability of the voluntary registration is to analyze the relationships between the returned items. Since each substantial error in an enumeration is likely to distort the expected proportions between individual items, the internal consistency in the relationships between the single items may be regarded as an indication that the totals are correct.

New workers

The unemployment report card instructed registrants to report as a "new worker" if they had never had a steady job and wanted work. This definition does not differ much from that used by the 1940 census, where "new workers" were defined as persons who had never worked full time on a private or non-emergency government job or at public emergency work for 1 month or more. The main disparity between the two definitions is that, in the voluntary

0.2 to 0.4 millions, but since there was no substantial difference in the volume of primary unemployment in November 1937 and March 1940, no correction is required in order to compare the figures for these two dates.

registration, persons seeking to reenter the labor market after a period of non-gainful activity, such as housework in their own homes, were likewise counted as "new workers."

The following numbers of new workers were reported among the unemployed:

	Total	Male	Female
Voluntary registration, November 1937.....	933,046	511,855	421,191
Census, April 1, 1940.....	796,695	482,061	314,634

The returned figures for men are practically identical, while the disparity in the numbers of new female workers may be accounted for by the fact that reentrants were classified as new workers in 1937 but not in April 1940.

Distribution of registrants by industries

The exclusion of "new workers" from the number registered as unemployed and wanting work leaves a total of 6,911,970 individuals (5,305,120 male and 1,606,850 female). The high proportion of registrants who did not report their industrial affiliation (813,064 male and 205,252 female), and especially the large number of persons who reported that they wanted work in domestic and personal service (241,702 male and 457,047 female), are probably accounted for by the additional workers who were not counted as "new workers."

The large number of agricultural workers among the registrants (859,113 male and 51,742 female) was the result of seasonal influences (the demand for farm labor in November being usually 700,000 to 800,000 less than at the peak season in July).¹³

Non-agricultural unemployment, without new workers, was twice as large in November 1937 as on April 1, 1930, but it was very near to the returns of the 1940 census (without the 500,000 upward adjustment):

	Total	Male	Female
April 1, 1930 (Classes A and B).....	3,044,330	2,554,054	490,276
November 1937 (Registration).....	6,001,115	4,446,007	1,555,108
April 1, 1940 (seeking work and on emergency work projects) ¹⁴	5,913,713	4,643,409	1,270,304

¹³ Woytinsky, *Seasonal Variations in Employment in the United States*, p. 73.

¹⁴ Enumerated in urban and in rural, non-farm areas. The distribution of unemployment between agriculture and other industries had not been published when this report was completed.

The increase in unemployment between 1930 and 1937 was comparatively larger among women than among men, which is in alignment with the changes in the composition of the labor supply. Besides, the dominantly male occupations were among those most severely affected early in the depression.

The increase of unemployment in different industries from 1930 to 1937 was not proportionate. It amounted to 60 per cent in manufactures and construction, 100 per cent in transportation, somewhat more than 100 per cent in trade, almost 200 per cent in public and domestic services, and over 200 per cent in professional service. Since the contrast in the unemployment rates by industries in the 1937 registration was less striking than in the 1930 census, it would appear that during this period the new job-seekers were unevenly distributed by industries and that there was a particularly large influx into those industries which were comparatively less affected by primary unemployment in the early phase of the depression.

Distribution of registrants by sex and age

The distribution of the unemployed by sex and age returned by the 1930 census was by no means "normal" in the sense that it was a pattern which would be approximately repeated at future enumerations. Rather, it was characteristic of an early phase of the depression and would be fairly certain to change with time.

For example, the increasing participation of women in gainful work since 1930 and the gradual elimination of child labor would cause the proportion of women among the unemployed to grow and that of children to decline. Also, since unemployment increased mainly because of the growing population, it was natural to expect that the proportion of unemployed women would correspond roughly to their increased proportion among gainful workers. Again, the distribution of the unemployed by sex and age would be affected by the entry into work of several hundred thousand additional jobseekers, most of them women.

The ratios of the number of registrants to that of the unemployed enumerated on April 1, 1930, in the same sex and age-classes, are shown on the next page.

Age-classes	All registrants	
	Male	Female
Total.....	216.6	404.4
15-19.....	315.7	425.1
20-24.....	217.2	358.1
25-34.....	194.0	364.5
35-44.....	187.1	444.1
45-54.....	213.4	486.4
55-64.....	251.7	522.1
65-74.....	235.4	375.9

Differentials in the relative increase of unemployment by sex and age-classes probably originated from two sources. On the one hand, the largest increase in rates is observed in the groups with the largest reserves of labor; on the other, it appears fairly probable that workers in the lowest and highest age-classes were exposed to a greater risk of unemployment than those in the middle age-groups and, once unemployed, had more difficulty in finding work.

Distribution of registrants in selected urban areas

The distribution of registrants in large cities may be checked with the returns of the January 1931 census of unemployment. Since unemployment was more severe in 1931 than in November 1937, and the 1931 unemployment figures were slightly inflated by the inclusion of part-time workers, the numbers of registrants in 1937 should be lower than those of the special census. As pointed out before, this was the case (1,751,812 in 1937 compared with 2,296,251 in 1931). The number of female registrants in 1937 had increased slightly and there was a considerable decline (by 571,593) in the number of unemployed men. To some extent this may be explained by seasonal factors (especially in the building trades).

As pointed out, additional jobseekers were already on the labor market in January 1931, and it may be supposed that they were more numerous at that time than in November 1937. Therefore the proportionally larger increase in the number of female registrants resulted from changes in the structure of the labor market rather than from the entry of wives into gainful work. Differentials by age were more noticeable. The number of female regis-

trants under 30 years of age was less than in January 1931; the increase was concentrated in age-classes above 30 years and grew with advancing age. It is fairly probable that some elderly women who recorded their desire for work in 1937 would not have been tabulated as unemployed by the 1931 census.

Additional workers in registrants' families

Although approximately 15 per cent of the registrants failed to answer the question about the number of other workers in their families, the respective tabulations of the voluntary registration are most instructive since they provide a direct indication of the number of additional jobseekers. Those who answered the question were distributed by number of other workers in their families as follows: ¹⁵

Number of other workers in the family	Unemployed (including emergency workers)		
	Total	Male	Female
	<i>Absolute numbers</i>		
Total	6,688,515	4,956,444	1,732,071
None	2,850,976	2,370,086	480,890
1	2,028,898	1,338,311	690,587
2	1,040,716	714,011	326,705
3 or more.....	767,925	534,036	233,889
	<i>Percentage distribution</i>		
Total	100.0	100.0	100.0
None	42.6	47.8	27.8
1	30.3	27.0	39.9
2	15.6	14.4	18.9
3 or more.....	11.5	10.8	13.5

The figures for male and female registrants combined may be compared with the distribution of all gainful workers in the United States by number of other earners in each family. The proportion of persons who were the sole breadwinners in the household was 42.6 per cent among all registrants in 1937, while it amounted to 51.1 per cent among the gainful workers enumerated by the 1930 census, and was still larger for non-farm families.

As explained in Chapter XI, the disparity between the rates of unemployment among the sole earners and among all workers indicates the presence and probable proportion of additional jobseekers in families with the usual earners out of work. If the

¹⁵ Census of Partial Employment, Unemployment and Occupations, 1937: *Final Report*, Vol. I, p. 12.

average proportion of the sole earners among all gainful workers in 1930 (51.1 per cent) is taken as the basis of calculation, the probable ratio of additional workers to usual earners among the registrants is estimated at 9.1 per cent. It will be considerably higher if it is taken into account that unemployment was concentrated in non-farm families, in which the proportion of sole earners is larger than on farms. Assuming that in the families of non-farm employees in 1937 approximately 55 per cent of all gainful workers were either the sole usual earners in the household or lived alone, the ratio of additional workers to registrants usually engaged in gainful work would range between 12.5 and 13.0 per cent. This would mean that about 800,000 to 850,000 registrants were additional workers in families with unemployed usual earners. This number will increase to 900,000 or 1,000,000 if allowance is made for additional workers who were employed at the time of the voluntary registration.

To sum up, it seems likely that, in the period between 1930 and 1937, the volume of unemployment increased by approximately 4.5 millions, and that of this number 700,000 to 800,000 were accounted for by forced entries of additional jobseekers. In other words, there were 118 to 122 unemployed per 100 jobs lost.¹⁶

¹⁶ If the total number unemployed in November 1937 was close to 11 millions, as suggested by the check census, this would indicate that the ratio of increased unemployment to lost jobs since 1930 amounted to 176 per cent. R. B. Vance and N. Danilevski drew this conclusion when they stated that "if 100 jobs are lost in the population, we may expect to find thereby not 100 but 176 unemployed" (*Milbank Memorial Fund Quarterly*, January 1940). However, the composition of the working population by sex, and age indicates that a "multiplier" of this magnitude is impossible. Approximately 61 per cent of all persons 16 to 69 years of age were reported by the 1930 census as engaged in gainful pursuits, and this proportion was certainly much larger among wage and salary earners. Assuming that, among salary and wage earners 16 to 69 years of age, 65 per cent were usual workers and 4 per cent were insane, blind, crippled and disabled persons, the labor force reserves would amount to 31 per cent of the entire population 16 to 69 years of age, or to 45 per cent of the usual gainful workers. Therefore, the theoretical maximum of the "multiplier" would be approximately 1.45. An increment of unemployment by 145 for 100 jobs lost might be expected if the unemployment of a usual earner resulted *automatically* in the entry into the labor market of all members of his family between the ages of 16 and 69. This is not realistic, however, because family obligations and other personal reasons prevent some persons in these age limits from entering the labor market, and the temporary layoff of the usual earner does not always compel his dependents to look for jobs. It seems doubtful whether the "multiplier" has ever been as high as 1.3 and available unemployment statistics suggest that in most cases it varied from 1.1 and 1.25. This would mean that usually from 25 to 50 per cent of the theoretical labor force reserves in a family are forced entries.

Since the foregoing analysis of the composition of registrants fails to reveal any contradiction or erratic deviation of the reported figures from the probable development, or disproportionality of individual items, it appears that the registration was fairly complete and accurate.

THE ENUMERATIVE CHECK CENSUS

The *Final Report* of the enumerative check census suggested that the number of totally unemployed individuals returned by the voluntary registration was understated by 3,140,000. Since there were certainly some individuals among the registrants who would not be tabulated as totally unemployed by a regular census, the number of registrants actually unemployed ought to be less than 7,845,000 and therefore the number of persons who were entitled to register but did not do so must be larger than 3,140,000. It appears that approximately 1 out of each 3 unemployed persons failed to register.

The *Final Report* stressed the reliability of the check census. "If used with due scientific caution, the enumerative check census provides a basis for measuring the relative completeness of the voluntary registration The enumerative check census is accepted as the relatively more satisfactory measure of unemployment because of its completeness of coverage of the population in all check areas. . . . There is little doubt but that the great majority of females, and very nearly all males, who were classified as unemployed on the basis of information given in the enumerative check census were eligible to register in the voluntary registration. The extent to which they did not register is shown by the statistics on completeness of registration."¹⁷

This explanation of the gap between the returns of the two enumerations appears logical, but it is not the only one possible. In fact, the December check census could have classified as unemployed persons who were not eligible to register in November and therefore the disparity between the returned figures does not necessarily mean that the voluntary registration was incomplete.

¹⁷ *Final Report*, Vol. IV, p. 5.

Percentage of completeness

If millions of unemployed workers had failed to register in November 1937, one would expect to find characteristic differentials in "percentages of completeness" for different groups of workers. For example, a more complete registration of white workers than of negroes would be expected, and a better registration in cities than in rural areas. The check census reported, however, that the completeness of the registration of male negroes in rural areas was 92.6 per cent, and that of male whites in cities with 10,000 inhabitants or more was only 70.1 per cent.¹⁸

It also seems logical that the registration would be most complete in the middle age-classes and less complete among workers of advanced ages. However, in the *Final Report* the following percentages of completeness by age-classes were reported:¹⁹

20 to 24 years.....	60.9 per cent	45 to 54 years.....	71.9 per cent
25 to 34 years.....	65.9 per cent	55 to 64 years.....	77.1 per cent
35 to 44 years.....	69.0 per cent	65 to 74 years.....	79.5 per cent

Differentials by geographic divisions were no less erratic. The reported percentage of completeness was 65.8 per cent in the West South Central states, 66.9 per cent in the Middle Atlantic states, 67.2 per cent in the South Atlantic states, 79.5 per cent in the East South Central area, and 62.3 in the highly industrialized and densely populated New England states.

These differences in percentages are so opposite to what one would expect that it is difficult to regard them as positive evidence that the voluntary registration was incomplete. Moreover, in view of the changes in economic conditions which took place in the

¹⁸ The following percentages of completeness for totally unemployed persons (without emergency workers) were reported:

Sex and race	Total	Rural territory	Urban places of less than 10,000	Urban places of 10,000 or more
Total	65.1	66.8	59.9	65.4
Male				
White	70.1	71.0	67.6	70.1
Negro and other.....	87.7	92.6	68.3	88.1
Female				
White	51.4	51.4	48.1	51.9
Negro and other.....	62.3	48.6	41.8	65.8

Source: *Final Report*, Vol. IV, p. 117.

¹⁹ Vol. IV, p. 118.

interim between the registration and the check census, it was inevitable that there would have been some disparity in their returns even if the registration had been 100 per cent complete.

At the time of the check census, there were probably about 1.5 million recently separated workers who had not been unemployed and therefore had not registered as wanting work in the week of November 14 to 20. In view of the rapidly increasing unemployment and announced layoffs, newly separated workers were likely to regard their chances for reemployment as small. Some of them may well have regarded the Unemployment Report Card which they had not filled out as a missed opportunity, and the check census apparently offered them a new chance to register. There is no positive evidence concerning the number of newly separated workers and those facing layoff who reported in this way to check census enumerators. It is known only that the check census covered approximately 1.5 per cent of the whole population of the United States and it may be estimated that in the houses along the selected postal routes there were approximately 120,000 individuals who registered as unemployed in November, some of whom had probably obtained work by the time of the check census. The number of newly separated workers along these same routes might have amounted to 20,000 to 25,000, and as many more may have suspected that their employment would soon be terminated. The new enumeration under these conditions would probably include all former registrants (including those since reemployed), plus many of the newly separated workers and those expecting to lose their jobs in the near future. Instead of 120,000 persons wanting work, the check census might report 140,000 or 150,000. The ratio of the registrants to the returns of the check census would be 80 to 86, but this would by no means indicate that the registration was incomplete.

This reasoning is, of course, hypothetical, but it would explain the differential "completeness rates." The New England states were heavily affected by the recession in 1937 and had a low "percentage of completeness," while the Middle Atlantic, South Atlantic, West South Central, and East South Central states were less affected and had comparatively high "percentages of completeness." It would explain also why the percentages were higher in

rural areas than in cities, and higher among negroes than among white workers. This applies likewise to the differences in "completeness" by age-classes of workers. The apparently lower completeness rate in the middle age-classes than among persons of more advanced age might result from the age distribution of the newly separated workers. Assuming that they were distributed by age in approximately the same way as all employed workers, the percentage of increase from the week of registration to the time of the check census would be particularly high in the middle age-classes.

Apart from the newly separated workers and those expecting layoffs, the check census enumerators might find in the families canvassed at the beginning of December 1937 other persons who wanted to be included in the registration. Increased primary unemployment during the two-week interim between the enumerations might have forced into the labor market about 200,000 additional workers. Furthermore, any registration continued beyond the originally set terminating date or reopened after a short interruption is apt to attract some new registrants.

To sum up, in view of the changes in business conditions and in the techniques of enumeration, and more specifically, since some of the canvassed families might have regarded the call of the enumerator as an opportunity to file applications for work, the apparent contradiction between the check census and the voluntary registration should by no means be construed as evidence of the incompleteness of the registration.

This statement would not be conclusive if there were no possibility of checking the returns of the registration directly with other available information on the volume of unemployment at that date. However, the direct comparison of the voluntary registration with the returns of earlier and later surveys made in preceding pages revealed no contradiction either in the totals or in the distribution of registrants by personal characteristics. It would seem, therefore, that the voluntary registration was successful, and that the same procedure might be recommended to the attention of federal and local statistical agencies for possible use in the future.

DEFICIT IN WORK OPPORTUNITIES IN NOVEMBER 1937

The *Final Report* of the check census estimated that 8,243,000 jobs would be necessary in November 1937 in order to employ the same proportion of the population (in each sex and age-group) that was employed in 1930.²⁰ The foregoing analysis makes it possible to estimate the number of jobs needed to reduce unemployment not to the 1930 level but to the *minimum* possible under the existing economic system.

It is recognized that the employment of all gainful workers is neither possible nor desirable. There must always remain a margin for labor turnover, migration of workers, seasonal variations in employment, etc. The normal seasonal unemployment alone in November would amount to 700,000 to 800,000 in agriculture and more than 600,000 in non-agricultural pursuits. A reduction of unemployment to less than 1.5 or 2 millions is practically impossible. If the voluntary registration in November 1937 is accepted as being reasonably complete, there were at that time 7,845,016 persons unemployed and wanting work. Approximately 900,000 to 1,000,000 among them were additional workers, and about 6.9 million usual earners were out of jobs. If 5 to 5.5 million new jobs were distributed among them, primary unemployment would be reduced to the minimum, and the secondary unemployment absorbed almost completely.

The shortages of labor which developed in 1941 as a result of the defense program, combined with the drafting of young men for military service, seem to confirm the supposition that the free reserves of manpower in 1937 were not quite as large as they were estimated on the basis of the check census.

CHANGES IN UNEMPLOYMENT AND NUMBER OF ADDITIONAL WORKERS FROM 1930 TO 1940

As pointed out above, additional workers were included in the reported totals of the voluntary registration in November 1937, as well as in the enumeration of April 1, 1930, the special census of January 1931 in selected urban areas, the National Health Survey in the winter of 1935-36, and the census of April 1, 1940.

²⁰ *Final Report*, Vol. IV, pp. 112-13.

On April 1, 1930, the number of unemployed amounted to 3,150,000, and 4 to 5 per cent of these were additional jobseekers. In January 1931, the number of unemployed workers in the country was probably 8.0 or 8.2 millions, including 500,000 to 550,000 additional workers. In the winter of 1935-36, there were 9.0 to 9.2 million unemployed in the nation, including about 1.0 to 1.2 million additional jobseekers. The voluntary registration in November 1937 reported a total of 7,845,000 persons wanting work, and an estimated 900,000 to 1,000,000 among them were additional workers. The volume of unemployment on April 1, 1940 was very near to that shown by the registration in November 1937.

These figures may cast light on well-known monthly estimates of unemployment. The two most frequently quoted series are compared in the following tabulation with the figures tentatively established by the preceding analysis :

	Direct enumerations, or estimates based on them	Estimate of Robert Nathan	Estimate of the National Indus- trial Conference Board
April 1, 1930.....	3,150,000	4,232,000 ²¹	3,131,000 ²¹
January 1931	8,100,000	7,648,000	8,072,000
Winter 1935-36	9,100,000	8,990,000 ²²	9,174,000 ²²
November 1937	7,845,000	7,177,000	7,751,000
April 1, 1940.....	8,000,000	10,220,000	9,269,000

Except for Nathan's estimate for April 1, 1930, both series up to 1937 agreed fairly well with the figures in the first column, which are based on direct enumerations. This is rather unexpected in view of the fact that these figures include additional workers who are supposedly excluded from the other two series.

The explanation of this agreement lies in the fact that Nathan's and the Board's series relied on the employment indexes of the Bureau of Labor Statistics which, as do all indexes of this type, tend to deviate downward and therefore require periodical upward adjustments.²³ A direct enumeration of *usual* earners out of work would probably provide figures appreciably lower than those suggested by the monthly estimates based on employment indexes, but in periods of severe unemployment the entry of additional job-

²¹ The mean for March and April 1930.

²² The mean from November 1935 to March 1936.

²³ See Woytinsky, "Controversial Aspects of Unemployment Estimates in the United States," *Review of Economic Statistics*, May 1941.

seekers into the labor market counterbalances to some extent the understatement of employment in these indexes.

A substantial disparity between the estimates based on the monthly employment indexes and the returns of a direct enumeration developed only after 1937. The source of this disparity is not very clear. It may be that the downward bias in the monthly employment indexes is particularly strong in the periods of increasing employment. This explanation is substantiated by a comparison of the variations in the volume of non-agricultural employment, as shown by the employment indexes, with the employers' returns to the Social Security Board. However, the relationship between these two sources of information has not been clarified in all its details, and as yet there is no consensus among the experts as to the best way to achieve their coordination.

APPENDIX NOTES

NOTE 1. THEORETICALLY PROBABLE PROPORTION OF WORKERS FAMILIES WITH UNEMPLOYMENT AS A FUNCTION OF THE UNEMPLOYMENT RATE AMONG WORKERS AND THE NUMBER OF WORKERS PER FAMILY

Assuming that the unemployment rate for workers in **all** families is (q), the probability that none of the workers in a household is unemployed will be measured by a decreasing series:

for one-worker families..... $1 - q$
 for 2-worker families..... $(1 - q)^2$
 for 3-worker families..... $(1 - q)^3$
 etc.

The probability that there will be at least one person out of work in families of different sizes is represented by an increasing series, which approaches to 1 with the growing number of workers in the household:

for one-worker families..... $q_1 = q$
 for 2-worker families..... $q_2 = 1 - (1 - q)^2$
 for 3-worker families..... $q_3 = 1 - (1 - q)^3$

If the numbers of families with 1, 2, 3, etc. workers are respectively f_1, f_2, f_3 , etc. the probability of the occurrence of unemployment is determined by the formula

$$Q_q = \frac{\sum f_i \cdot q_i}{\sum f_i} \dots \dots \dots (1)$$

As this formula is based on the assumption of an equal unemployment rate among workers in different family groups, it is strictly applicable only to a more or less homogeneous population. It is not valid, for example, with respect to the whole, rural and urban, population of the United States, but it is applicable to the *urban* population of individual states and cities and, with certain reservations, of the United States as a whole.

If f_1, f_2, f_3 , etc. show the percentage of families with the specified number of workers, so that $\sum f_i = 100$, the probability of the occurrence of unemployment in a family will be

$$Q_q = \frac{1}{100} \sum f_i \cdot q_i \dots \dots \dots (2)$$

Obviously (Q_q) increases with (q) and with the proportion of multi-worker families, so that for any given value of (q) there must be a

positive correlation between (Q_q) and the number of workers per family (m). The relationship between the two values is determined by the relationship which exists between the distribution of families by number of workers and the value of (m). This last relationship cannot be expressed by a mathematical formula, since the same number of workers per family may result from different distributions of families. But statistical observations show that there is a typical relationship between (Q_q) and (m) for all values of (q) and for all empirically ascertained distributions of families by number of workers. This relationship is illustrated by Table 22, which is based on the distribution of families reported by the 1930 census and which shows the theoretical values of (Q_q) for the urban families in 49 jurisdictions for the arbitrarily assumed unemployment rates of 10 and 20 per cent. It is found that ($Q_{0.10}$) varies between 12.6 per cent for Nevada with $m=1.30$, and 15.9 per cent for Rhode Island with $m=1.69$, while ($Q_{0.20}$) ranges between 24.5 and 30.0 per cent for the same states.

Diagram XXI shows the correlation between the value of (Q_q) for individual states and the number of workers per urban family in the same states. The dots for ($Q_{0.10}$) and ($Q_{0.20}$) plotted on this chart are closely clustered along the straight regression lines AB and A'B', with the following equations:

$$\left. \begin{array}{l} \text{for AB} \dots\dots\dots mQ_{0.1} = 0.013 + 0.087 m \\ \text{for A'B'} \dots\dots\dots mQ_{0.2} = 0.053 + 0.147 m \end{array} \right\} \dots\dots (3)$$

If the probability of the occurrence of unemployment in a family is expressed in per cent, the equations will be:

$$\left. \begin{array}{l} \text{for AB} \dots\dots\dots mQ_{0.1} = 1.3 + 8.7 m \\ \text{for A'B'} \dots\dots\dots mQ_{0.2} = 5.3 + 14.7 m \end{array} \right\} \dots\dots (4)$$

Using (m') for the number of *supplementary* earners per family (so that $m'=m-1$), these equations may be written as follows:

$$\left. \begin{array}{l} \text{for AB} \dots\dots\dots mQ_{0.1} = 10 + 8.7 m' \\ \text{for A'B'} \dots\dots\dots mQ_{0.2} = 20 + 14.7 m' \end{array} \right\} \dots\dots (5)$$

As the deviations of the empirical points from the respective regression lines on Diagram XXI are negligible, the typical values ($Q_{0.10}$) and ($Q_{0.20}$) (for distributions of families) may be represented as linear functions of (m).

Experiments with other values of (q), e. g., 5, 15, 25 per cent, etc., give a similar distribution of dots along straight regression lines and a similar form of (mQ_q) as a function of (m). Generally,

$$mQ_q = A_q + B_q \cdot m \dots\dots\dots (6)$$

where (A_q) and (B_q) vary with (q).

TABLE 22. THEORETICALLY PROBABLE PROPORTION OF URBAN FAMILIES WITH UNEMPLOYMENT (Q) FOR UNEMPLOYMENT RATES OF 10 AND 20 PER CENT, BY STATES
(Calculated on the basis of the distribution of urban families by number of workers, April 1, 1930.)

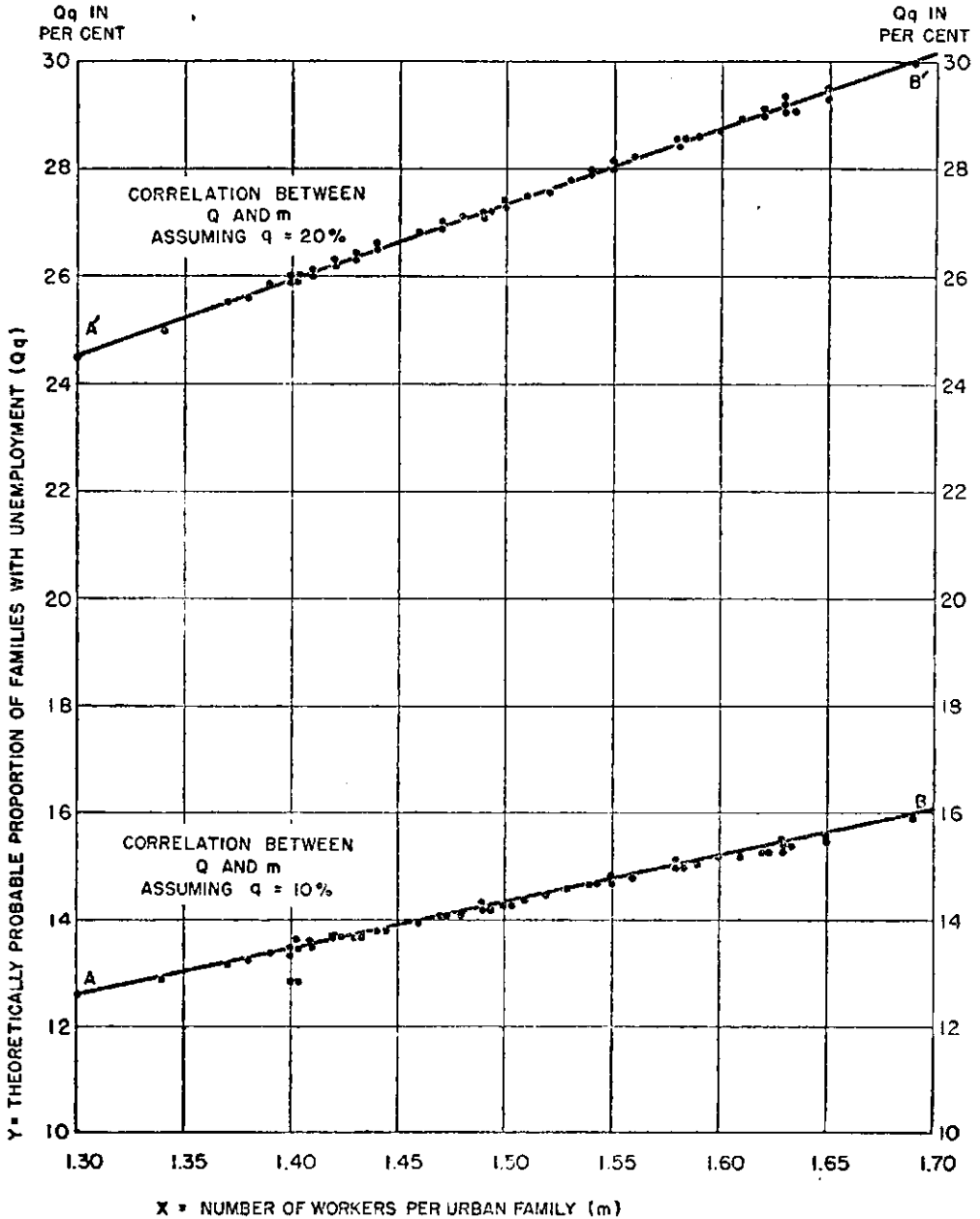
States	Percentage of urban families with the specified number of gainful workers			Number of gainful workers per family (m)	Theoretically probable proportion of families with unemployment (Q)	
	1	2	3 or more		Assuming q = 10%	Assuming q = 20%
Maine.....	63.3	24.3	12.4	1.55	14.7	28.0
New Hampshire.....	60.9	25.1	14.0	1.59	15.1	28.6
Vermont.....	66.4	23.0	10.6	1.49	14.2	27.2
Massachusetts.....	59.9	24.1	16.0	1.63	15.4	29.1
Rhode Island.....	56.7	25.4	17.9	1.69	15.9	30.0
Connecticut.....	60.2	23.9	15.9	1.63	15.4	29.1
New York.....	62.1	23.4	14.5	1.62	15.3	29.1
New Jersey.....	60.5	23.9	15.6	1.62	15.3	29.0
Pennsylvania.....	62.7	23.0	14.3	1.58	15.0	28.4
Ohio.....	65.7	23.7	10.6	1.50	14.3	27.3
Indiana.....	66.3	23.9	9.8	1.48	14.1	27.1
Illinois.....	63.5	24.1	12.4	1.54	14.7	27.9
Michigan.....	66.9	23.2	9.9	1.47	14.1	27.0
Wisconsin.....	65.9	22.9	11.2	1.50	14.3	27.4
Minnesota.....	66.7	22.7	10.6	1.49	14.2	27.1
Iowa.....	63.6	22.8	8.6	1.44	13.8	26.5
Missouri.....	64.5	24.3	11.2	1.52	14.5	27.6
North Dakota.....	71.4	20.5	8.1	1.40	13.5	26.0
South Dakota.....	70.5	21.9	7.6	1.41	13.5	26.0
Nebraska.....	67.7	23.0	9.3	1.46	14.0	26.8
Kansas.....	69.4	22.6	8.0	1.42	13.7	26.2
Delaware.....	61.8	24.4	13.8	1.58	15.0	28.5
Maryland.....	58.4	25.7	15.9	1.65	15.5	29.3
Dist. of Columbia.....	58.1	28.9	13.0	1.61	15.2	28.9
Virginia.....	60.8	26.1	13.1	1.58	15.0	28.5
West Virginia.....	67.4	22.6	10.0	1.47	14.1	26.9
North Carolina.....	57.4	28.3	14.3	1.63	15.5	29.3
South Carolina.....	57.1	22.1	13.8	1.63	15.4	29.2
Georgia.....	56.0	29.4	14.6	1.65	15.6	29.5
Florida.....	63.4	26.5	10.1	1.51	14.4	27.5
Kentucky.....	63.8	24.4	11.8	1.53	14.6	27.8
Tennessee.....	61.8	26.5	11.7	1.55	14.8	28.1
Alabama.....	61.7	26.3	12.0	1.56	14.8	28.2
Mississippi.....	62.1	26.8	11.1	1.54	14.7	28.0
Arkansas.....	68.0	23.5	8.5	1.44	13.8	26.6
Louisiana.....	60.3	25.8	13.1	1.60	15.2	28.7
Oklahoma.....	70.3	22.6	7.1	1.40	13.5	26.0
Texas.....	65.6	24.4	10.0	1.49	14.2	27.2
Montana.....	73.2	19.6	7.2	1.37	13.2	25.5
Idaho.....	71.3	21.4	7.3	1.39	13.4	25.8
Wyoming.....	74.5	19.8	5.7	1.34	12.9	25.0
Colorado.....	69.1	22.8	8.1	1.43	13.7	26.3
New Mexico.....	72.9	19.8	7.3	1.38	13.3	25.6
Arizona.....	71.3	21.1	7.6	1.40	13.4	25.9
Utah.....	70.0	20.7	9.3	1.43	13.7	26.4
Nevada.....	77.0	18.1	4.9	1.30	12.6	24.5
Washington.....	69.7	22.8	7.5	1.41	13.6	26.1
Oregon.....	68.3	23.9	7.8	1.42	13.7	26.3
California.....	70.0	23.0	7.0	1.40	13.5	26.0

Source: Fifteenth Census of the United States: 1930, Families, Vol. VI, p. 47. Families without gainful workers are excluded.

DIAGRAM XXI

CORRELATION BETWEEN THE THEORETICALLY PROBABLE PROPORTION OF FAMILIES WITH UNEMPLOYMENT (Q) AND THE NUMBER OF WORKERS PER FAMILY (m) FOR UNEMPLOYMENT RATES (q) OF 10 AND 20 PER CENT

(Q is calculated in accordance with the distribution of urban families by number of workers, as reported by the 1930 census. Each dot represents one state.)



Since for $m=1$ the probability of the occurrence of unemployment in a family is ${}_1Q_q=q$, there must be a steady relationship between (A_q) and (B_q) :

$$A_q + B_q = q \dots \dots \dots (7)$$

Therefore if (m') is used for $(m-1)$, formula (6) will be

$${}_mQ_q = (A_q + B_q) + B_q \cdot m' = q + B_q \cdot m' \dots \dots \dots (8)$$

which is the general form of equation (5).

NOTE 2. DIFFERENTIATED RATES OF UNEMPLOYMENT FOR THE
"FIRST," "SECOND," AND OTHER WORKERS IN FAMILIES

The cross-classification of families canvassed in Philadelphia by number of employable persons and employment status, as shown in Appendix Table X-B, reveals strongly differentiated rates of unemployment among the "first" and supplementary earners.

Since it seems logical to assume that, among the "first" workers in families, the unemployment rate is independent of the number of supplementary earners in these families, it may be ascertained directly from the returned figures for one-worker households. In 1931 this rate (U_1) was 16.7 per cent, in 1932, 29.7 per cent, in 1933, 33.6 per cent, etc.

Combined with the figures showing the distribution of 2-worker families by employment status, these rates may be used for estimating the probability of employment or unemployment of the "second" workers in the family. Appendix Table X-B shows, e. g., that in 1931, 62.3 per cent of the 2-worker families were completely employed. Since the probability of employment of the "first" workers (E_1) was 83.3 per cent ($100 - 16.7$), it is found that the probability of employment of the "second" workers in these families (E_2) amounted to 74.8 per cent ($62.3 \div 83.3$). On the other hand, in 8.9 per cent of the 2-worker families in 1931, both earners were unemployed, which indicates that in families with the first earner out of a job the unemployment rate among "second" workers (E_2) was 53.3 per cent ($8.9 \div 16.7$).

Applying the same reasoning to the data for other years, the following unemployment rates in 2-worker families are found (in per cent):

Proportion of unemployed workers in 2-worker households

Years	Total (U)	"First" workers (U ₁)	"Second" workers (U ₂) If the "first" worker is	
			Employed	Unemployed
1931.....	23.3	16.7	25.2	53.3
1932.....	40.2	29.7	42.7	70.0
1933.....	43.9	33.6	43.4	75.3
1935.....	32.1	24.1	31.8	66.0
1936.....	29.8	23.7	29.0	58.6
1937.....	23.2	20.8	19.8	47.1
1938.....	31.5	26.5	29.9	54.3

In the case of 3-worker families, it might be assumed that the unemployment rates among the "first" and "second" workers in these households are about the same as in the 2-worker families. Then the rate of unemployment among "third" workers will be determined (1) for families in which the first and second workers are both employed; (2) for families in which they are both out of jobs. The same procedure may be used for estimating unemployment rates among the "fourth" earners in 4-worker families and "fifth" earners in 5-worker households. The obtained rates are summarized as follows:

Unemployment rate (in per cent) among the third, fourth, and fifth workers

Years	Third workers in families in which all preceding workers are		Fourth workers in families in which all preceding workers are		Fifth workers ¹ in families in which all preceding workers are	
	Employed	Unem- ployed	Employed	Unem- ployed	Employed	Unem- ployed
1931.....	27.6	68.5	32.6	82.0	26.6	78.0
1932.....	42.7	78.4	40.7	78.5	40.9	100.0
1933.....	48.1	77.1	43.6	86.2	46.1	89.3
1935.....	32.6	69.2	33.0	90.0	38.9	76.8
1936.....	29.2	56.8	32.3	75.9	36.9	58.3
1937.....	24.3	61.6	25.8	57.4	30.8	37.0
1938.....	36.0	63.2	36.5	78.0	47.8	56.3

Although these figures are logically deduced from the reported data, they are obviously fallacious. There is no reason why the unemployment rate among supplementary earners in multi-worker families should vary so widely with the employment status of other earners in the same family.

On the other hand, without assuming this correlation, the distribution of families by employment status, as shown in Appendix Table X-B, appears impossible. In this connection, data for the 2-worker families are particularly instructive. Assuming that the unemployment rate among "first" workers is (x), and that among

¹ This group of families includes a number of households with 6 workers and more. The reported proportions of completely employed and completely unemployed families are therefore smaller than they would be if only 5-worker households were included. This exaggerates the unemployment rate among "fifth" workers in families with the 4 preceding workers employed, and understates it when the preceding workers are unemployed.

“second” workers is (y) (independent of the employment status of the first worker), the proportion of completely employed families must be $(1-x)(1-y)$, and that of completely unemployed households (xy) . This permits a system of two equations for each year:

1931.....	$(1-x)(1-y)=0.623$, and $xy=0.089$	(1)
1932.....	$(1-x)(1-y)=0.403$, and $xy=0.208$	(2)
1933.....	$(1-x)(1-y)=0.376$, and $xy=0.253$	(3)
1935.....	$(1-x)(1-y)=0.518$, and $xy=0.159$	(4)
1936.....	$(1-x)(1-y)=0.542$, and $xy=0.139$	(5)
1937.....	$(1-x)(1-y)=0.634$, and $xy=0.099$	(6)
1938.....	$(1-x)(1-y)=0.515$, and $xy=0.144$	(7)

These equations admit no rational solution, their roots both for (x) and (y) being complex, i. e., expressed by formulas containing $\sqrt{-1}$. This indicates some error or contradiction in the conditions of the problem expressed by the respective equations. The error is in the implication that the number of gainful workers in different families does not vary with the employment status of the first workers. The theory of additional workers eliminates this error.

APPENDIX TABLES

TABLE I. TURNOVER OF LABOR FROM 1910 TO 1919, BY MONTHS
A. MONTHLY ACCESSION AND SEPARATION RATES, IN PER CENT OF THE NUMBER OF WORKERS IN REPORTING FIRMS¹

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919
1. Accessions										
January	10.50	5.00	5.00	15.25	5.75	5.00	18.50	10.50	15.50	11.50
February	9.50	6.50	5.50	12.75	6.25	6.00	19.25	9.25	13.50	6.75
March	16.25	8.25	7.50	13.75	7.00	7.00	13.00	9.75	17.75	5.75
April	17.75	8.00	9.75	17.50	5.75	9.50	17.50	11.25	22.00	6.00
May	18.02	9.50	9.25	15.75	6.00	7.50	14.75	17.00	21.75	6.50
June	18.25	9.50	11.75	13.00	8.00	7.25	11.50	16.75	18.25	7.00
July	14.75	7.75	11.50	11.50	7.50	6.50	9.25	14.75	19.00	8.75
August	16.50	9.25	12.75	9.00	8.00	7.00	13.25	17.75	16.50	10.75
September	11.00	5.00	12.00	8.75	10.00	12.25	10.75	16.75	13.75	12.25
October	9.00	4.75	12.75	7.25	6.25	12.00	10.25	17.50	12.50	15.00
November	7.25	3.75	10.25	6.00	5.25	17.00	6.25	15.25	13.75	9.25
December	4.25	2.75	9.00	4.50	5.50	12.75	8.50	13.25	11.00	6.00
2. Separations										
January	10.25	6.00	6.00	11.75	5.00	4.50	10.75	13.25	13.75	12.00
February	11.75	5.75	6.50	11.25	4.25	5.25	10.50	10.50	15.00	9.25
March	15.00	6.50	6.75	14.50	5.75	6.75	12.00	10.00	17.25	10.00
April	17.25	7.25	7.75	15.25	6.25	5.75	9.75	12.25	19.00	9.25
May	15.75	8.25	9.50	15.50	10.25	5.75	12.25	16.50	17.50	8.75
June	14.00	9.25	7.50	13.00	12.25	5.00	16.00	15.00	15.75	8.00
July	15.00	8.75	9.25	13.00	5.00	6.25	8.25	14.25	16.50	6.00
August	17.50	8.50	9.75	10.25	7.25	5.75	10.00	16.50	18.00	9.25
September	12.25	6.75	8.50	11.00	5.25	7.50	8.50	16.00	12.50	8.25
October	9.50	6.75	8.50	8.50	5.75	6.25	6.75	13.25	13.00	6.75
November	8.75	7.00	7.00	6.75	4.00	9.25	6.00	12.75	8.25	6.00
December	5.00	6.75	6.75	6.00	4.75	6.50	6.00	16.25	9.00	4.00

B. "DERIVED" INDEX OF EMPLOYMENT IN REPORTING ESTABLISHMENTS²
(Index numbers for the end of each month. January 1, 1910 = 100)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919
January	100.3	99.8	92.4	121.4	114.6	108.4	134.3	171.6	185.0	219.5
February	98.0	100.6	91.5	123.2	115.6	106.2	146.0	169.4	182.2	214.0
March	99.2	102.3	92.2	122.3	115.8	103.4	147.5	169.0	183.1	204.9
April	99.7	103.1	94.0	125.0	113.8	105.1	158.9	167.3	188.6	198.3
May	102.0	104.4	93.8	125.3	107.5	104.3	162.9	168.1	196.6	193.8
June	106.3	104.6	97.8	125.3	103.6	104.2	155.5	171.1	201.6	191.9
July	106.0	103.6	100.0	123.5	105.0	101.4	157.1	171.9	206.6	197.1
August	105.0	104.4	103.0	121.9	104.6	100.0	162.2	174.1	203.5	200.1
September	103.6	102.5	106.6	119.2	108.7	103.5	165.9	175.4	206.0	208.1
October	103.1	100.5	111.1	117.7	108.0	108.7	171.7	182.9	205.0	225.3
November	101.6	97.2	114.7	116.8	108.2	117.4	172.1	187.4	216.3	232.6
December	100.8	93.3	117.3	115.1	107.8	124.6	176.4	181.8	220.6	237.2

¹ The numbers of reporting firms and their employees were as follows:

	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919
Firms.....	3	6	8	39	26	30	10	20	19	9
Workers in 1,000's..	9	14	15	160	46	90	58	34	29	14

² Calculated from the monthly net balance of accessions and separations.

Source: Computed from Paul F. Brissenden and Emil Frankel, *Labor Turnover in Industry* (New York: Macmillan Co., 1922), pp. 208-11. See Chapter II for methodological explanations of Section B.

TABLE II. TURNOVER OF LABOR IN MANUFACTURING INDUSTRIES FROM
1919 TO 1929, BY MONTHS

A. MONTHLY ACCESSION AND SEPARATION RATES, IN PER CENT OF THE NUMBER
OF WORKERS IN REPORTING FIRMS

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
1. Accessions											
January	9.3	10.4	2.6	4.8	10.2	4.8	4.4	4.7	3.0	2.8	4.9
February	4.9	10.9	2.5	5.2	10.0	4.1	4.1	4.7	3.5	2.6	4.7
March	6.2	11.7	2.7	5.8	10.2	3.3	4.3	4.7	3.6	3.0	5.1
April	6.9	10.7	2.9	6.6	11.9	4.0	4.7	4.4	4.0	3.3	5.8
May	6.8	11.0	3.2	9.1	11.7	2.6	3.8	5.0	4.0	3.9	5.0
June	9.2	15.5	1.8	9.1	13.2	2.7	6.0	4.8	3.7	3.4	5.1
July	16.7	14.5	1.2	9.8	11.1	2.5	5.4	4.5	3.1	3.9	5.1
August	11.9	12.5	1.5	10.6	7.3	2.6	6.6	5.5	3.3	4.6	4.5
September	13.0	11.3	2.2	9.3	8.5	3.2	7.0	5.8	3.6	4.7	5.0
October	18.2	6.9	5.1	9.8	6.7	2.8	6.1	4.8	3.4	4.8	3.8
November	10.3	3.7	3.9	8.3	4.0	3.7	5.5	3.3	2.6	4.2	2.0
December	7.7	2.4	3.4	7.6	3.4	3.3	4.0	2.3	2.0	3.2	1.2
2. Total Separations											
January	9.2	9.5	6.1	2.7	5.3	3.6	3.0	3.2	3.4	2.3	3.0
February	6.3	9.8	4.5	2.8	7.0	3.1	3.0	3.4	3.1	2.3	3.5
March	5.6	12.9	5.5	3.3	8.5	4.8	3.9	4.2	3.5	2.7	4.1
April	5.8	13.0	5.0	4.2	10.9	6.0	5.3	5.1	4.0	3.2	4.6
May	6.4	9.9	3.9	5.5	9.7	5.1	4.3	4.2	3.7	3.5	4.3
June	8.8	10.9	4.7	6.3	9.6	3.9	4.3	3.9	3.7	3.3	4.3
July	7.0	11.7	4.2	6.0	8.9	3.1	4.0	4.4	3.0	3.2	3.9
August	8.8	11.8	4.3	7.0	7.8	3.2	4.1	4.3	3.0	3.5	4.0
September	9.3	10.9	5.5	8.0	8.7	3.7	5.2	4.9	3.8	4.2	4.2
October	8.6	8.6	3.3	6.9	5.9	3.3	4.5	3.6	3.3	3.5	3.6
November	8.1	7.0	2.7	6.3	4.8	2.9	3.4	3.3	2.6	2.9	3.2
December	6.3	7.3	2.8	4.4	2.9	2.5	2.9	2.5	2.3	2.4	2.4
3. Quits											
January	3.9	8.1	1.8	1.6	4.0	2.6	2.2	2.3	1.9	1.3	2.2
February	3.5	8.6	1.7	1.9	6.0	2.3	2.2	2.3	1.8	1.3	2.6
March	5.9	11.7	2.5	2.2	7.1	3.7	2.9	2.9	2.5	1.7	3.1
April	4.6	11.9	2.7	3.0	9.7	4.8	4.1	3.8	2.7	2.2	3.6
May	4.8	8.7	2.5	4.6	8.4	3.5	3.3	3.1	2.7	2.3	3.4
June	7.9	9.9	2.8	5.4	8.5	2.5	3.5	2.9	2.4	2.3	3.3
July	5.7	10.2	2.5	5.1	7.7	2.2	3.1	3.2	2.0	2.3	3.0
August	7.4	10.5	2.4	5.9	6.5	2.2	3.3	3.3	1.9	2.7	3.2
September	8.0	9.6	2.7	6.9	7.2	2.5	4.2	4.0	2.8	3.4	3.2
October	7.1	6.0	2.1	5.8	4.5	2.3	3.5	2.6	2.1	2.7	2.4
November	7.0	3.2	1.7	5.1	3.1	1.6	2.5	2.1	1.5	2.1	1.6
December	5.5	2.5	1.4	3.4	2.2	1.8	2.1	1.7	1.2	1.7	1.1
4. Discharges											
January	1.8	1.3	0.5	0.4	1.0	0.5	0.5	0.6	0.4	0.3	0.4
February	1.2	1.1	0.5	0.2	0.9	0.5	0.6	0.5	0.4	0.4	0.5
March	0.6	1.2	0.5	0.6	1.4	0.6	0.5	0.7	0.5	0.4	0.6
April	0.8	1.1	0.4	0.7	1.1	0.6	0.6	0.7	0.5	0.4	0.6
May	1.1	1.1	0.2	0.6	1.2	0.7	0.5	0.6	0.4	0.4	0.5
June	0.8	1.0	0.5	0.7	1.0	0.5	0.5	0.4	0.6	0.4	0.5
July	1.1	1.2	0.4	0.7	1.0	0.4	0.5	0.6	0.4	0.4	0.5
August	1.3	1.0	0.3	0.8	1.0	0.5	0.4	0.6	0.4	0.4	0.4
September	1.3	1.1	0.2	0.7	1.0	0.6	0.7	0.5	0.5	0.4	0.5
October	1.5	1.3	0.2	0.7	1.0	0.5	0.6	0.6	0.5	0.4	0.4
November	1.1	0.7	0.2	1.0	0.7	0.5	0.5	0.5	0.3	0.4	0.3
December	0.8	0.7	0.2	0.8	0.4	0.4	0.5	0.3	0.3	0.4	0.2
5. Layoffs											
January	3.5	0.1	3.8	0.7	0.3	0.5	0.3	0.4	1.0	0.7	0.3
February	1.6	0.1	2.3	0.6	0.1	0.3	0.3	0.5	0.8	0.7	0.4
March	0.8	0.1	2.6	0.6	0.1	0.5	0.5	0.6	0.5	0.7	0.5
April	0.4	0.0	1.8	0.5	0.1	0.6	0.6	0.5	0.8	0.6	0.5
May	0.5	0.0	1.2	0.3	0.1	0.9	0.5	0.5	0.6	0.7	0.5
June	0.1	0.1	1.4	0.2	0.1	0.9	0.3	0.5	0.7	0.6	0.4
July	0.2	0.2	1.3	0.2	0.2	0.5	0.4	0.6	0.5	0.5	0.4
August	0.3	0.3	1.6	0.3	0.3	0.5	0.4	0.4	0.7	0.4	0.4
September	0.0	0.2	2.5	0.3	0.5	0.6	0.3	0.4	0.5	0.4	0.5
October	0.0	1.3	1.0	0.3	0.4	0.6	0.4	0.4	0.7	0.4	0.8
November	0.0	3.1	0.8	0.3	1.0	0.8	0.4	0.7	0.8	0.4	1.3
December	0.0	4.1	1.2	0.1	0.4	0.3	0.4	0.6	0.7	0.4	1.2

TABLE II—Continued

B. EMPLOYMENT IN REPORTING ESTABLISHMENTS AND IN ALL MANUFACTURING INDUSTRIES

(Average 1923-1925 = 100)

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
1. "Derived" index of employment in reporting establishments ¹											
January	57.3	77.9	73.0	63.4	89.8	103.6	98.1	112.7	119.2	120.7	131.7
February	56.5	78.8	71.5	64.9	92.5	104.6	99.1	114.2	119.6	121.0	133.3
March	56.9	77.8	69.5	66.6	94.0	103.0	99.5	114.8	119.8	121.4	134.6
April	57.5	76.1	68.1	68.2	95.0	101.0	99.0	114.0	119.8	121.5	136.2
May	57.7	76.9	67.6	70.6	96.8	98.5	98.5	114.9	120.1	121.9	137.2
June	58.0	80.5	65.7	72.6	100.3	97.3	100.1	115.9	120.1	122.1	138.3
July	63.6	82.7	63.7	75.4	102.6	96.7	101.5	116.0	120.2	122.9	139.9
August	65.5	83.3	62.0	78.1	102.1	96.1	104.0	117.4	120.6	124.3	140.6
September	67.9	83.6	59.9	79.1	101.8	95.6	105.9	118.4	120.3	124.9	141.8
October	74.5	82.2	61.0	81.4	102.6	95.2	107.6	119.9	120.4	126.5	142.0
November	76.1	79.5	61.7	83.0	101.8	95.9	109.9	119.9	120.4	128.2	140.3
December	77.2	75.6	62.1	85.6	102.3	96.7	111.1	119.6	120.1	129.2	138.7
2. Employment in manufacturing industries (Index of the Bureau of Labor Statistics)											
January	104.5	114.3	79.5	82.4	100.2	100.1	96.6	101.0	98.6	95.3	101.7
February	101.2	113.3	81.7	84.5	102.4	101.7	98.3	102.0	100.2	97.2	104.1
March	101.7	115.6	82.9	85.8	104.6	101.9	99.2	102.5	100.9	98.2	105.4
April	101.9	114.0	82.3	85.7	105.1	100.1	99.1	101.8	100.3	97.8	106.7
May	102.6	111.1	82.0	87.9	105.2	96.8	98.6	100.8	99.6	97.8	106.5
June	103.9	110.1	81.2	89.6	105.7	93.8	98.4	100.8	99.7	98.5	106.8
July	106.6	107.5	79.7	90.5	104.6	90.6	98.3	99.7	98.6	98.4	107.3
August	109.3	107.4	81.1	93.1	104.8	92.0	100.0	101.8	99.9	101.1	109.2
September	111.3	106.1	83.0	95.1	105.3	94.2	101.9	104.0	101.2	103.3	110.3
October	110.9	102.1	83.7	96.6	104.0	95.0	102.6	103.6	100.2	103.5	109.0
November	112.1	95.6	83.7	98.0	102.8	94.5	102.2	101.6	98.0	102.6	104.6
December	113.9	88.0	82.7	99.1	101.1	96.1	101.8	100.3	96.5	102.1	100.7

¹ Calculated from the net balance of accessions and separations.Source: Sections A and B-2, computed from *Monthly Labor Review*. See Chapter II for methodological explanations of Section B-1.

TABLE III. TURNOVER OF LABOR IN MANUFACTURING INDUSTRIES FROM
1930 TO 1941, BY MONTHS

A. MONTHLY ACCESSION AND SEPARATION RATES, IN PER CENT OF THE NUMBER
OF WORKERS IN REPORTING FIRMS

Month	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941
1. Accessions												
January	3.95	2.97	4.15	3.48	5.81	6.33	3.65	4.60	3.78	4.09	3.74	5.54
February	3.94	2.82	2.75	2.56	6.71	4.23	2.95	4.71	3.13	3.06	2.98	4.92
March	4.15	3.67	2.75	2.22	6.33	3.79	3.97	4.74	3.13	3.34	2.94	5.62
April	3.55	3.06	2.76	4.87	5.18	3.63	4.46	4.04	2.58	2.93	3.05	6.04
May	3.28	2.79	2.59	7.21	4.19	3.01	4.05	3.56	2.84	3.29	3.36	5.95
June	2.92	2.41	2.70	10.21	3.58	3.18	4.49	3.69	3.44	3.92	4.76	6.31
July	2.51	3.02	3.01	9.48	3.71	4.17	4.94	3.36	4.81	4.16	4.77	6.00
August	2.71	2.60	4.21	8.59	3.24	4.60	4.72	3.36	5.29	5.06	6.63	5.43
September	3.27	3.58	4.04	5.53	3.61	4.95	5.09	3.78	4.51	6.17	6.21	5.16
October	2.56	2.75	3.72	3.97	4.09	5.23	4.83	2.84	5.19	5.89	5.52	—
November	2.05	3.63	3.07	3.71	4.32	3.63	4.60	1.79	4.24	4.10	4.65	—
December	2.13	3.29	3.07	3.37	6.14	3.30	4.41	2.12	3.22	2.84	4.11	—
2. Total Separations												
January	5.09	2.88	3.35	3.56	3.43	3.04	3.57	3.38	6.08	3.19	3.43	3.41
February	4.72	2.69	3.32	4.40	2.89	2.79	3.06	2.85	4.39	2.61	3.56	3.15
March	5.37	2.95	4.37	4.60	3.22	3.24	2.88	3.20	4.46	3.18	3.46	3.40
April	5.21	3.41	5.73	2.78	3.38	3.73	3.29	3.09	4.54	3.46	3.66	3.89
May	5.17	3.83	5.11	2.36	4.88	4.38	3.32	3.37	4.57	3.48	3.78	3.86
June	5.31	5.09	5.63	2.47	4.60	4.49	3.28	4.02	4.41	3.31	3.36	3.71
July	5.84	4.67	5.24	3.49	3.85	3.67	3.22	3.52	3.81	3.36	3.35	4.24
August	5.75	3.67	3.85	3.40	4.50	3.77	4.73	3.99	3.08	3.01	3.00	4.14
September	5.00	5.62	4.47	4.26	5.12	3.19	3.30	4.62	3.56	2.79	3.22	4.53
October	4.49	6.22	3.46	4.58	5.30	3.13	3.25	5.69	3.30	2.91	3.23	—
November	3.91	3.92	3.39	4.79	4.55	3.55	3.04	6.87	3.14	2.95	3.06	—
December	3.79	3.43	4.06	4.69	3.45	3.76	3.41	8.51	3.88	3.46	3.16	—
3. Quits												
January	1.85	0.74	0.71	0.65	0.90	0.76	0.71	1.27	0.52	0.85	0.74	1.62
February	1.60	0.74	0.71	0.49	0.85	0.73	0.68	1.19	0.49	0.64	0.73	1.76
March	1.94	0.94	0.86	0.53	0.93	0.75	0.86	1.43	0.61	0.82	0.78	2.13
April	2.11	1.14	0.91	0.63	1.11	0.93	1.16	1.38	0.59	0.76	0.84	2.45
May	2.01	1.12	0.68	0.84	1.01	1.21	1.06	1.37	0.62	0.68	0.87	2.54
June	1.85	1.02	0.66	1.03	0.94	0.83	1.13	1.89	0.61	0.73	0.90	2.42
July	1.35	1.10	0.63	1.25	0.70	0.90	1.15	1.25	0.59	0.70	0.96	2.55
August	1.40	1.05	0.67	1.22	0.75	0.86	1.23	1.23	0.65	0.82	1.21	2.71
September	1.50	1.16	0.76	1.65	1.55	1.05	1.57	1.59	0.82	1.07	1.58	3.06
October	1.29	1.00	0.65	0.87	0.73	0.89	1.29	1.05	0.78	0.93	1.51	—
November	0.90	0.72	0.54	0.78	0.62	0.77	1.13	0.72	0.60	0.83	1.18	—
December	0.84	0.66	0.56	0.72	0.58	0.69	1.05	0.60	0.58	0.69	1.14	—
4. Discharges												
January	0.54	0.19	0.19	0.15	0.18	0.18	0.20	0.21	0.11	0.10	0.14	0.18
February	0.62	0.20	0.18	0.13	0.19	0.18	0.17	0.22	0.11	0.10	0.16	0.19
March	0.60	0.26	0.21	0.14	0.21	0.17	0.19	0.24	0.11	0.13	0.15	0.21
April	0.53	0.31	0.22	0.15	0.23	0.20	0.21	0.23	0.10	0.10	0.13	0.25
May	0.48	0.28	0.16	0.18	0.22	0.17	0.20	0.21	0.13	0.13	0.13	0.24
June	0.46	0.23	0.14	0.26	0.18	0.20	0.23	0.19	0.11	0.12	0.14	0.26
July	0.32	0.25	0.14	0.26	0.19	0.20	0.23	0.21	0.09	0.12	0.14	0.29
August	0.36	0.22	0.14	0.31	0.19	0.21	0.27	0.19	0.10	0.14	0.16	0.30
September	0.36	0.24	0.14	0.27	0.16	0.19	0.26	0.19	0.12	0.14	0.16	0.31
October	0.32	0.21	0.14	0.24	0.19	0.21	0.24	0.19	0.12	0.17	0.19	—
November	0.24	0.17	0.15	0.22	0.15	0.20	0.21	0.16	0.10	0.15	0.18	—
December	0.21	0.16	0.15	0.18	0.15	0.18	0.22	0.14	0.09	0.12	0.16	—
5. Layoffs												
January	2.70	1.95	2.45	2.76	2.35	2.10	2.66	1.90	5.45	2.24	2.55	1.61
February	2.50	1.75	2.43	3.78	1.85	1.88	2.21	1.44	3.79	1.87	2.67	1.20
March	2.83	1.75	3.30	3.93	2.08	2.32	1.83	1.53	3.74	2.23	2.53	1.06
April	2.57	1.96	4.60	2.00	2.04	2.60	1.92	1.48	3.85	2.60	2.69	1.19
May	2.68	2.43	4.27	1.34	3.65	3.00	2.06	1.79	3.82	2.67	2.78	1.08
June	3.00	3.84	4.83	1.18	3.48	3.46	1.92	1.94	3.69	2.46	2.32	1.03
July	4.17	3.32	4.47	1.92	2.96	2.57	1.84	2.06	3.13	2.54	2.25	1.40
August	3.99	2.40	3.04	1.87	3.56	2.70	3.23	2.57	2.33	2.05	1.63	1.13
September	3.14	4.22	3.57	2.34	3.41	1.95	1.47	2.84	2.62	1.58	1.48	1.16
October	2.88	5.01	2.67	3.47	4.38	2.03	1.72	4.45	2.40	1.81	1.53	—
November	2.77	3.03	2.70	3.79	3.78	2.58	1.70	5.99	2.44	1.97	1.60	—
December	2.74	2.61	3.35	3.79	2.72	2.89	2.14	7.77	3.21	2.65	1.86	—

TABLE III—Continued

B. EMPLOYMENT IN REPORTING ESTABLISHMENTS AND IN ALL MANUFACTURING INDUSTRIES

(Average 1923-1925 = 100)

Month	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941
1. "Derived" index of employment in reporting establishments ¹												
January	101.6	81.3	72.4	63.7	78.1	84.5	89.4	101.1	89.1	87.7	96.8	111.0
February	100.6	81.4	72.5	63.1	80.5	86.5	89.4	102.7	87.5	88.2	96.7	113.2
March	99.6	81.8	71.7	61.8	83.3	87.4	89.8	104.4	86.3	88.5	96.2	115.4
April	98.2	81.9	70.1	61.7	85.3	87.6	90.9	105.7	84.9	88.4	95.6	117.9
May	96.5	81.4	68.2	63.8	85.8	86.9	91.7	106.3	83.3	88.0	95.1	120.4
June	94.4	79.8	66.3	67.9	85.0	85.8	92.6	106.3	82.2	88.2	95.6	123.3
July	91.7	78.1	64.6	72.5	84.6	85.4	94.0	106.0	82.2	88.5	96.9	126.0
August	88.8	77.1	64.0	76.6	84.0	86.0	94.8	105.6	83.6	89.4	99.4	127.9
September	86.7	75.9	64.3	79.0	82.8	87.1	95.6	104.8	84.9	91.9	102.7	—
October	85.1	73.8	64.5	79.3	81.7	88.8	97.2	102.9	86.1	94.8	105.4	—
November	83.5	72.4	64.5	78.6	81.1	89.8	98.8	98.8	87.4	96.7	107.4	—
December	82.0	72.2	64.1	77.7	82.1	89.6	100.0	93.2	87.6	97.0	108.8	—
2. Employment in manufacturing industries (Revised index of the Bureau of Labor Statistics)												
January	98.2	80.1	70.0	63.3	78.8	86.7	92.3	104.7	91.0	94.5	105.0	115.5
February	98.3	80.8	71.2	64.7	83.7	89.6	92.7	107.6	91.6	96.1	105.0	117.8
March	97.9	81.2	70.1	62.3	87.2	91.0	93.9	110.1	91.2	97.0	104.4	119.9
April	97.3	81.2	67.8	63.9	88.8	91.2	95.5	111.3	89.3	96.9	103.2	122.6
May	95.6	80.6	65.2	66.8	89.0	89.9	96.4	111.5	87.0	95.9	102.5	124.9
June	93.6	78.8	63.2	71.8	87.8	88.3	97.0	110.3	85.4	96.4	103.1	127.9
July	90.4	77.7	61.0	76.2	86.3	88.7	98.4	110.8	85.9	96.6	103.2	130.7
August	89.7	77.9	62.7	81.3	87.4	91.7	101.2	112.2	90.2	99.5	107.4	133.0
September	90.7	78.3	66.1	85.0	83.5	93.9	103.8	112.2	93.6	103.7	111.4	135.3
October	88.7	75.5	67.2	84.6	85.9	95.2	104.9	110.3	94.2	107.3	113.8	—
November	85.4	72.7	66.3	81.2	84.3	94.6	104.9	104.2	95.3	107.5	114.7	—
December	82.9	72.0	65.1	79.5	85.6	94.2	106.4	97.7	96.2	107.8	116.2	—

¹ Calculated from the net balance of accessions and separations. The index was first computed on the basis of January 1, 1930 = 100. For comparability with the BLS index of factory employment, it was interpolated and index numbers for the 15th of each month were established. Then these index numbers were increased proportionally so that their average for the 12 months in 1930 was equal to the average for the same year of the BLS index.

Source: *Monthly Labor Review*, March, November 1941. See Chapter II for methodological explanations of Section B-1.

TABLE IV. LABOR TURNOVER FROM 1930 TO 1940, BY INDUSTRIES
(Monthly rates in per cent of the number of workers in reporting firms)

Industry	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940 ¹
AUTOMOBILES AND BODIES											
Accessions	4.75	6.66	6.76	9.72	12.02	7.08	7.41	6.00	7.47	6.81	6.33
Separations (total)	5.85	7.63	8.24	8.08	9.78	5.85	6.48	7.75	7.92	6.45	5.62
Quits	1.37	1.09	0.84	1.21	1.85	1.30	1.32	1.14	0.41	0.84	0.96
Discharges	0.33	0.33	0.22	0.40	0.39	0.27	0.26	0.19	0.06	0.07	0.06
Layoffs	4.14	6.18	7.18	6.47	7.53	4.29	4.91	6.42	7.45	5.54	4.61
AUTOMOBILE PARTS AND EQUIPMENT											
Accessions	6.39	5.34	8.16	10.47	10.44	7.63	7.04	6.00	8.50	7.72	7.51
Separations (total)	9.74	5.92	8.16	8.00	9.75	6.33	5.31	9.08	8.23	6.40	5.96
Quits	1.94	0.92	0.75	1.33	1.62	1.11	1.59	1.74	0.49	0.69	1.13
Discharges	0.56	0.32	0.16	0.33	0.41	0.33	0.43	0.33	0.11	0.16	0.25
Layoffs	7.24	4.68	7.25	6.34	7.72	4.89	3.29	7.01	7.58	5.55	4.58
BOOTS AND SHOES											
Accessions	3.49	4.19	3.30	3.86	3.46	3.18	3.16	3.60	3.68	3.31	3.13
Separations (total)	4.81	4.36	3.38	3.30	3.21	2.85	2.99	4.36	3.41	3.15	3.09
Quits	1.86	1.59	0.96	0.96	0.87	0.66	0.82	1.06	0.75	0.76	0.82
Discharges	0.55	0.37	0.23	0.24	0.22	0.19	0.22	0.16	0.12	0.13	0.11
Layoffs	2.40	2.39	2.18	2.09	2.11	2.00	1.94	3.09	2.54	2.26	2.16
BRICK, TILE AND TERRA COTTA											
Accessions	—	—	7.73	10.57	9.08	8.89	6.96	5.35	7.01	6.09	5.30
Separations (total)	—	—	11.60	8.73	9.22	7.99	5.27	7.11	6.33	4.73	5.01
Quits	—	—	0.28	0.54	0.97	1.62	1.18	1.25	0.62	0.76	1.01
Discharges	—	—	0.25	0.16	0.20	0.15	0.24	0.25	0.12	0.14	0.16
Layoffs	—	—	11.06	8.03	8.06	6.21	3.85	5.61	5.58	3.83	3.84
CEMENT											
Accessions	—	—	—	—	—	—	—	—	5.65	5.46	4.83
Separations (total)	—	—	—	—	—	—	—	—	7.07	4.65	4.02
Quits	—	—	—	—	—	—	—	—	0.47	0.41	0.52
Discharges	—	—	—	—	—	—	—	—	0.13	0.07	0.09
Layoffs	—	—	—	—	—	—	—	—	6.47	4.17	3.41
CIGARS AND CIGARETTES											
Accessions	—	—	3.26	4.94	4.33	2.79	5.04	3.57	3.37	3.43	3.21
Separations (total)	—	—	3.89	3.05	4.43	4.10	3.96	3.75	3.60	3.34	3.05
Quits	—	—	1.85	1.35	1.35	1.19	1.56	1.78	1.08	1.31	1.48
Discharges	—	—	0.34	0.30	0.23	0.22	0.21	0.13	0.11	0.14	0.16
Layoffs	—	—	1.70	1.40	2.86	2.69	2.19	1.84	2.41	1.89	1.40
COTTON MANUFACTURING											
Accessions	3.50	3.95	5.63	6.96	4.47	4.36	4.15	3.24	4.35	3.96	4.40
Separations (total)	4.69	4.45	5.22	4.71	4.78	4.68	3.45	4.61	4.19	3.31	4.18
Quits	1.81	1.36	1.09	1.67	1.55	1.16	1.43	1.50	0.99	1.39	1.75
Discharges	0.52	0.38	0.27	0.38	0.31	0.27	0.28	0.25	0.17	0.23	0.21
Layoffs	2.36	2.72	3.85	2.65	2.92	3.24	1.74	2.85	3.03	1.70	2.22

TABLE IV—Continued

Industry	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940 ¹
ELECTRICAL MACHINERY											
Accessions	—	—	0.99	4.09	2.73	3.21	4.43	3.59	2.55	3.65	4.43
Separations (total)	—	—	4.86	3.02	2.38	2.24	2.23	3.69	4.35	2.19	2.10
Quits	—	—	0.42	0.59	0.48	0.58	0.86	1.14	0.55	0.64	0.96
Discharges	—	—	0.10	0.10	0.12	0.12	0.15	0.18	0.06	0.07	0.11
Layoffs	—	—	4.33	2.33	1.78	1.53	1.22	2.38	3.74	1.49	1.03
FOUNDRIES AND MACHINE SHOP											
Accessions	—	2.61	2.52	5.28	4.91	4.47	4.68	3.87	2.49	3.71	3.80
Separations (total)	—	4.47	3.87	3.30	4.03	3.39	3.06	3.98	4.35	2.14	2.48
Quits	—	0.63	0.31	0.52	0.68	0.75	1.16	1.18	0.52	0.55	0.95
Discharges	—	0.23	0.10	0.17	0.20	0.26	0.31	0.28	0.08	0.10	0.20
Layoffs	—	3.61	3.45	2.61	3.15	2.38	1.59	2.51	3.75	1.49	1.33
FURNITURE											
Accessions	—	4.63	4.20	7.15	4.89	4.77	5.75	4.39	4.81	4.58	4.19
Separations (total)	—	5.39	5.16	5.53	5.04	3.77	4.33	5.94	5.11	3.57	3.67
Quits	—	0.81	0.43	0.78	0.62	0.71	1.31	1.74	0.83	0.78	1.15
Discharges	—	0.33	0.15	0.31	0.23	0.23	0.32	0.31	0.18	0.21	0.24
Layoffs	—	4.25	4.57	4.44	4.19	2.83	2.70	3.89	4.09	2.58	2.28
GLASS											
Accessions	—	—	—	—	—	—	—	—	4.36	3.12	3.29
Separations (total)	—	—	—	—	—	—	—	—	3.63	2.97	2.74
Quits	—	—	—	—	—	—	—	—	0.47	0.36	0.62
Discharges	—	—	—	—	—	—	—	—	0.10	0.09	0.08
Layoffs	—	—	—	—	—	—	—	—	3.07	2.52	2.04
HARDWARE											
Accessions	—	—	1.01	2.47	2.31	4.11	3.60	3.21	2.57	3.29	4.10
Separations (total)	—	—	3.39	2.19	1.90	1.91	2.13	4.58	3.18	2.41	2.72
Quits	—	—	0.39	0.50	0.56	0.90	0.84	1.44	0.46	0.67	1.40
Discharges	—	—	0.07	0.09	0.11	0.33	0.18	0.21	0.07	0.17	0.14
Layoffs	—	—	2.93	1.59	1.23	0.67	1.11	2.93	2.64	1.57	1.18
IRON AND STEEL											
Accessions	2.94	1.68	1.49	4.58	2.83	2.47	3.24	2.73	1.78	3.01	2.67
Separations (total)	3.75	2.66	2.88	2.21	2.50	1.91	1.84	4.18	2.70	1.25	2.00
Quits	1.63	0.78	0.59	0.64	0.74	0.78	1.04	2.13	0.40	0.41	0.73
Discharges	0.31	0.10	0.05	0.11	0.09	0.08	0.09	0.08	0.06	0.05	0.09
Layoffs	1.82	1.76	2.25	1.46	1.66	1.04	0.71	1.97	2.24	0.78	1.19
KNIT GOODS											
Accessions	—	—	—	—	—	—	—	2.69	3.26	2.98	2.99
Separations (total)	—	—	—	—	—	—	—	3.46	3.09	2.50	2.94
Quits	—	—	—	—	—	—	—	1.51	0.81	0.97	0.95
Discharges	—	—	—	—	—	—	—	0.09	0.09	0.13	0.12
Layoffs	—	—	—	—	—	—	—	1.86	2.19	1.41	1.88

TABLE IV—Continued

Industry	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
MACHINE TOOLS											
Accessions	—	—	—	—	—	—	—	—	1.07	4.35	4.70
Separations (total)	—	—	—	—	—	—	—	—	3.18	1.44	2.06
Quits	—	—	—	—	—	—	—	—	0.46	0.82	1.41
Discharges	—	—	—	—	—	—	—	—	0.08	0.12	0.38
Layoffs	—	—	—	—	—	—	—	—	2.63	0.50	0.27
MEN'S CLOTHING											
Accessions	—	—	3.81	3.76	3.23	3.90	4.35	3.86	5.80	4.50	4.56
Separations (total)	—	—	3.67	3.18	3.49	3.31	3.82	5.37	6.17	4.21	4.88
Quits	—	—	0.94	0.83	0.77	0.79	0.87	0.98	0.73	0.76	0.90
Discharges	—	—	0.09	0.12	0.10	0.12	0.08	0.07	0.07	0.10	0.16
Layoffs	—	—	2.64	2.23	2.62	2.40	2.86	4.32	5.37	3.36	3.82
PAPER AND PULP											
Accessions	—	—	—	—	—	—	—	—	1.74	2.33	2.02
Separations (total)	—	—	—	—	—	—	—	—	1.70	1.75	1.93
Quits	—	—	—	—	—	—	—	—	0.47	0.62	0.84
Discharges	—	—	—	—	—	—	—	—	0.15	0.12	0.12
Layoffs	—	—	—	—	—	—	—	—	1.08	1.02	0.97
PETROLEUM REFINING											
Accessions	—	—	2.00	3.71	3.19	2.63	3.19	2.79	1.62	2.59	1.82
Separations (total)	—	—	2.61	2.21	3.28	2.68	2.81	2.71	2.07	2.09	1.76
Quits	—	—	0.40	0.47	0.48	0.48	0.62	0.53	0.36	0.41	0.51
Discharges	—	—	0.10	0.08	0.14	0.11	0.11	0.08	0.05	0.07	0.06
Layoffs	—	—	2.11	1.66	2.65	2.09	2.08	2.10	1.66	1.61	1.19
PRINTING AND PUBLISHING											
BOOK AND JOB PRINTING											
Accessions	—	—	—	—	—	—	—	—	3.67	4.26	4.52
Separations (total)	—	—	—	—	—	—	—	—	3.90	3.93	4.26
Quits	—	—	—	—	—	—	—	—	0.40	0.47	0.79
Discharges	—	—	—	—	—	—	—	—	0.14	0.14	0.17
Layoffs	—	—	—	—	—	—	—	—	3.36	3.32	3.31
NEWSPAPERS											
Accessions	—	—	—	—	—	—	—	—	1.98	2.07	2.18
Separations (total)	—	—	—	—	—	—	—	—	1.92	2.05	1.99
Quits	—	—	—	—	—	—	—	—	0.32	0.30	0.46
Discharges	—	—	—	—	—	—	—	—	0.07	0.16	0.08
Layoffs	—	—	—	—	—	—	—	—	1.54	1.59	1.45
RADIOS AND PHONOGRAPHS											
Accessions	—	—	—	—	—	—	—	—	6.91	6.56	5.33
Separations (total)	—	—	—	—	—	—	—	—	6.25	5.42	5.12
Quits	—	—	—	—	—	—	—	—	1.06	1.62	1.71
Discharges	—	—	—	—	—	—	—	—	0.14	0.22	0.17
Layoffs	—	—	—	—	—	—	—	—	5.05	3.59	3.24

TABLE IV—Continued

Industry	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940 ¹
RAYON											
Accessions	—	—	—	—	—	—	—	2.40	4.26	2.39	2.56
Separations (total)	—	—	—	—	—	—	—	3.97	3.42	1.75	1.73
Quits	—	—	—	—	—	—	—	0.90	0.64	0.58	0.95
Discharges	—	—	—	—	—	—	—	0.25	0.20	0.14	0.13
Layoffs	—	—	—	—	—	—	—	2.81	2.58	1.02	0.65
RUBBER BOOTS AND SHOES											
Accessions	—	—	—	—	—	—	—	—	3.37	2.94	4.36
Separations (total)	—	—	—	—	—	—	—	—	3.18	3.08	2.87
Quits	—	—	—	—	—	—	—	—	0.59	0.80	1.15
Discharges	—	—	—	—	—	—	—	—	0.02	0.07	0.14
Layoffs	—	—	—	—	—	—	—	—	2.56	2.21	1.58
RUBBER TIRES											
Accessions	—	1.77	1.27	5.20	2.42	1.74	2.93	1.03	2.57	2.66	2.55
Separations (total)	—	2.62	2.10	2.47	2.46	2.22	1.38	3.09	3.28	1.69	2.34
Quits	—	0.86	0.50	0.74	0.50	0.44	0.68	0.68	0.52	0.49	0.57
Discharges	—	0.13	0.09	0.13	0.06	0.05	0.08	0.09	0.04	0.06	0.05
Layoffs	—	1.63	1.51	1.59	1.90	1.72	0.62	2.32	2.72	1.14	1.72
SAWMILLS											
Accessions	7.47	6.76	6.28	9.07	7.78	8.91	6.88	6.42	6.43	5.41	5.13
Separations (total)	10.10	8.97	7.58	6.18	7.32	7.79	6.47	8.18	6.20	4.71	4.55
Quits	3.00	1.35	0.79	1.43	1.20	2.99	1.79	2.31	1.23	1.37	1.43
Discharges	1.06	0.46	0.34	0.42	0.45	0.36	0.34	0.29	0.21	0.19	0.19
Layoffs	6.03	7.16	6.45	4.33	5.67	4.43	4.34	5.58	4.76	3.14	2.92
SLAUGHTERING AND MEAT PACKING											
Accessions	7.68	6.67	6.33	9.36	11.18	7.29	8.28	7.07	7.49	7.42	7.71
Separations (total)	8.35	6.77	6.93	7.19	10.86	8.83	7.36	7.51	7.42	6.67	6.95
Quits	2.22	1.30	0.87	0.95	1.14	0.75	1.16	0.90	0.56	0.60	0.92
Discharges	0.76	0.46	0.33	0.38	0.38	0.23	0.26	0.21	0.15	0.16	0.18
Layoffs	5.37	5.01	5.73	5.86	9.33	7.85	5.94	6.41	6.71	5.91	5.85
STEAM AND HOT-WATER HEATING APPARATUS											
Accessions	—	—	—	—	—	—	—	—	2.28	2.83	4.90
Separations (total)	—	—	—	—	—	—	—	—	2.40	1.97	2.11
Quits	—	—	—	—	—	—	—	—	0.50	0.71	1.09
Discharges	—	—	—	—	—	—	—	—	0.10	0.11	0.17
Layoffs	—	—	—	—	—	—	—	—	1.80	1.16	0.84
WOOLEN AND WORSTED GOODS											
Accessions	—	—	—	—	—	—	—	4.05	7.27	5.60	6.68
Separations (total)	—	—	—	—	—	—	—	6.87	6.28	5.41	6.04
Quits	—	—	—	—	—	—	—	1.05	0.75	1.09	1.55
Discharges	—	—	—	—	—	—	—	0.12	0.08	0.13	0.13
Layoffs	—	—	—	—	—	—	—	5.71	5.45	4.19	4.36

¹ Since January 1940 the BLS has reported "miscellaneous separations" separately from layoffs. For comparability with preceding years, the two items are counted together in this table.

Source: U. S. Bureau of Labor Statistics, *A Review of Factory Labor Turn-over, 1930-36*, Reprint 608; *Monthly Labor Review*, 1937 to 1941.

TABLE V. TURNOVER OF LABOR BY SIZE OF ESTABLISHMENT AND INDUSTRY,
1931 TO 1940
(Annual turnover rates in per cent of the working force)

Industry and size-class of factories	Accessions	Separations			
		Total	Quits	Discharges	Layoffs
AUTOMOTIVE PARTS AND EQUIPMENT INDUSTRIES					
1936 { Less than 150 employees	78.7	65.2	16.5	6.5	42.1
1936 { 150 employees or more	84.2	61.3	18.6	5.2	37.4
1937 { Less than 150 employees	74.7	89.4	17.4	5.9	66.1
1937 { 150 employees or more	73.6	108.6	23.0	3.9	81.7
BOOT AND SHOE INDUSTRY					
1931 { Less than 300 employees	62.1	69.2	14.6	4.8	49.9
1931 { 300 employees or more	45.7	43.2	19.9	4.1	19.2
1932 { Less than 300 employees	64.2	66.3	10.0	2.9	53.4
1932 { 300 employees or more	32.5	31.9	12.0	2.5	17.4
1934 { Less than 300 employees	57.5	56.9	8.5	1.8	46.7
1934 { 300 employees or more	34.6	31.0	9.6	2.6	18.9
1935 { Less than 300 employees	63.3	54.6	7.2	1.6	45.8
1935 { 300 employees or more	28.0	25.5	7.8	2.2	15.4
1938 { Less than 300 employees	75.5	66.4	10.9	1.8	53.7
1938 { 300 employees or more	35.7	32.5	8.4	1.3	22.8
1939 { Less than 300 employees	70.0	61.2	10.4	1.6	49.3
1939 { 300 employees or more	32.8	28.5	8.7	1.6	18.3
COTTON MANUFACTURING INDUSTRY					
1931 { Less than 300 employees	39.0	43.9	11.1	2.7	30.1
1931 { 300 employees or more	47.7	52.7	18.1	3.5	31.1
1932 { Less than 300 employees	46.3	50.3	6.9	2.0	41.4
1932 { 300 employees or more	66.6	62.0	13.8	2.7	45.5
1935 { Less than 300 employees	48.4	50.5	6.9	2.1	41.6
1935 { 300 employees or more	51.7	48.7	14.7	3.0	31.0
1936 { Less than 300 employees	50.5	37.2	10.0	2.5	24.7
1936 { 300 employees or more	48.1	39.1	17.7	3.4	18.0
1937 { Less than 300 employees	37.4	46.8	11.0	1.9	33.9
1937 { 300 employees or more	38.6	49.8	19.1	3.0	27.7
1938 { Less than 300 employees	63.5	58.9	7.4	1.2	50.4
1938 { 300 employees or more	49.6	45.7	11.9	1.9	31.9
FOUNDRIES AND MACHINE SHOPS					
1931 { Less than 100 employees	36.7	63.6	5.5	4.3	53.9
1931 { 100 employees or more	27.6	48.2	7.7	2.6	37.9
1932 { Less than 100 employees	46.2	71.2	4.2	1.0	66.0
1932 { 100 employees or more	26.4	42.8	4.0	1.3	37.6
1935 { Less than 100 employees	58.6	49.5	8.8	3.2	37.5
1935 { 100 employees or more	52.0	40.0	8.8	3.1	28.0
1936 { Less than 100 employees	62.1	42.9	11.5	4.0	27.3
1936 { 100 employees or more	57.2	37.3	15.6	3.7	18.0
1937 { Less than 100 employees	51.7	55.4	14.2	3.0	38.2
1937 { 100 employees or more	43.6	44.7	14.1	3.0	27.6
1938 { Less than 100 employees	40.4	53.5	5.2	1.1	47.2
1938 { 100 employees or more	28.7	50.1	5.9	0.9	43.2
FURNITURE MANUFACTURING					
1932 { Less than 75 employees	72.6	87.9	4.8	1.3	81.8
1932 { 75 employees or more	35.7	43.6	4.9	1.5	37.2
1933 { Less than 75 employees	83.0	64.7	7.2	3.8	53.8
1933 { 75 employees or more	84.0	69.9	11.9	2.1	55.9
1934 { Less than 75 employees	78.9	65.0	4.8	2.4	57.8
1934 { 75 employees or more	59.2	55.9	6.8	3.0	46.1
1935 { Less than 75 employees	61.2	54.9	8.6	1.9	44.4
1935 { 75 employees or more	60.4	46.6	9.7	2.3	34.6

TABLE V—Continued

Industry and size-class of factories	Accessions	Separations			
		Total	Quits	Discharges	Layoffs
IRON AND STEEL					
1932 { Less than 1,000 employees	44.2	68.0	5.1	0.8	62.1
1932 { 1,000 employees or more	10.9	24.5	6.0	0.6	17.9
1933 { Less than 1,000 employees	89.2	59.9	7.5	0.8	51.6
1933 { 1,000 employees or more	46.0	20.3	7.4	1.4	11.5
1934 { Less than 1,000 employees	50.1	51.0	11.0	2.0	38.0
1934 { 1,000 employees or more	32.4	28.7	8.9	1.0	18.8
1935 { Less than 1,000 employees	48.5	34.5	12.4	1.5	20.6
1935 { 1,000 employees or more	28.1	21.9	9.7	1.0	11.2
1936 { Less than 1,000 employees	47.1	31.3	15.8	2.8	12.6
1936 { 1,000 employees or more	37.5	20.7	12.3	1.0	7.4
1937 { Less than 1,000 employees	38.5	53.0	18.6	1.7	32.7
1937 { 1,000 employees or more	32.2	37.2	14.5	0.9	21.8
MEN'S CLOTHING					
1932 { Less than 150 employees	58.1	57.3	13.4	0.9	43.0
1932 { 150 employees or more	37.1	40.6	10.5	1.1	29.0
1933 { Less than 150 employees	75.9	66.5	19.3	1.4	45.8
1933 { 150 employees or more	36.6	29.8	9.6	1.1	19.1
PETROLEUM REFINING					
1936 { Less than 500 employees	72.4	64.6	6.4	1.6	56.7
1936 { 500 employees or more	31.5	30.1	7.0	0.8	22.3
1937 { Less than 500 employees	70.4	65.6	5.4	2.2	58.0
1937 { 500 employees or more	32.4	30.0	8.8	1.1	20.2
SAWMILLS					
1933 { Less than 150 employees	131.2	93.6	7.8	4.0	81.8
1933 { 150 employees or more	105.2	70.8	15.6	5.4	49.7
1934 { Less than 150 employees	98.8	105.4	13.0	3.2	89.2
1934 { 150 employees or more	91.6	82.6	14.4	5.1	63.0
1937 { Less than 150 employees	90.0	102.7	20.0	4.0	78.7
1937 { 150 employees or more	69.4	79.7	22.6	3.1	54.0
1938 { Less than 150 employees	95.6	97.2	13.0	2.1	82.1
1938 { 150 employees or more	64.1	58.5	11.5	2.2	44.8
SLAUGHTERING AND MEAT PACKING					
1932 { Less than 100 employees	19.1	21.9	5.5	4.8	11.6
1932 { 100 employees or more	83.8	91.5	9.7	3.5	78.3
1933 { Less than 100 employees	42.5	26.3	8.6	4.8	12.9
1933 { 100 employees or more	119.1	91.9	11.2	4.7	76.1
1936 { Less than 100 employees	35.1	28.9	11.2	5.5	12.2
1936 { 100 employees or more	105.3	91.4	15.0	2.9	73.5
1937 { Less than 100 employees	47.3	44.8	14.2	7.4	23.2
1937 { 100 employees or more	85.1	90.1	10.7	2.1	77.3
RUBBER INDUSTRY					
1939 { Less than 1,000 employees	64.7	61.4	9.8	1.2	50.5
1939 { 1,000 employees or more	30.7	20.6	6.9	0.8	12.9
1940 { Less than 1,000 employees	71.1	58.5	15.7	1.9	41.0
1940 { 1,000 employees or more	33.1	22.8	6.4	0.8	15.7

Sources: *Monthly Labor Review*, October, November 1933; February, June, August, November 1934; March, May 1935; July, September 1936; January, March, October 1937; April, June 1938; January, February, July, September 1939; January, May 1940; April 1941.

TABLE VI. AUXILIARY TABLES FOR COMPUTING THE THEORETICALLY PROBABLE PROPORTION OF WORKERS' FAMILIES WITH UNEMPLOYMENT (Q') AND OF UNEMPLOYED INDIVIDUALS (q')

A. COMPUTATION OF (Q') AS A FUNCTION OF THE UNEMPLOYMENT RATE (q) AND NUMBER OF WORKERS PER FAMILY (m)

Per cent of unemployed individuals (q)	Number of workers per family (m)						
	1.3	1.4	1.5	1.6	1.7	1.8	1.9
	<i>(Q') in per cent</i>						
5	6.51	6.94	7.37	7.80	8.23	8.66	9.09
6	7.73	8.25	8.77	9.27	9.80	10.32	10.84
7	8.95	9.56	10.16	10.77	11.37	11.98	12.59
8	10.17	10.86	11.56	12.25	12.95	13.64	14.34
9	11.39	12.17	12.95	13.73	14.51	15.30	16.08
10	12.61	13.48	14.35	15.22	16.09	16.96	17.83
11	13.83	14.77	15.72	16.66	17.60	18.55	19.49
12	15.04	16.06	17.07	18.08	19.10	20.11	21.12
13	16.24	17.32	18.40	19.48	20.56	21.64	22.72
14	17.43	18.57	19.71	20.85	22.00	23.14	24.28
15	18.61	19.81	21.01	22.21	23.41	24.61	25.81
16	19.77	21.02	22.28	23.53	24.78	26.04	27.29
17	20.93	22.24	23.55	24.86	26.16	27.47	28.78
18	22.08	23.44	24.80	26.16	27.52	28.87	30.23
19	23.23	24.63	26.04	27.45	28.85	30.26	31.66
20	24.38	25.85	27.32	28.79	30.26	31.73	33.20
21	25.53	27.04	28.56	30.07	31.59	33.11	34.62
22	26.67	28.23	29.79	31.35	32.90	34.46	36.02
23	27.80	29.40	31.00	32.60	34.20	35.80	37.40
24	28.93	30.57	32.21	33.85	35.49	37.13	38.77
25	30.05	31.73	33.41	35.09	36.77	38.45	40.13
26	31.16	32.88	34.60	36.32	38.04	39.76	41.48
27	32.27	34.03	35.78	37.54	39.30	41.06	42.82
28	33.38	35.18	36.97	38.77	40.56	42.36	44.15
29	34.49	36.32	38.15	39.99	41.82	43.65	45.49
30	35.61	37.48	39.35	41.22	43.09	44.96	46.83

B. COMPUTATION OF (q') AS A FUNCTION OF THE PROPORTION OF WORKERS' FAMILIES WITH UNEMPLOYMENT (Q) AND NUMBER OF WORKERS PER FAMILY (m)

Per cent of families with unemployment (Q)	Number of workers per family (m)						
	1.3	1.4	1.5	1.6	1.7	1.8	1.9
	<i>(q') in per cent</i>						
5	3.80	3.58	3.38	3.18	3.00	2.84	2.70
6	4.60	4.34	4.10	3.86	3.64	3.44	3.26
7	5.41	5.10	4.82	4.54	4.28	4.04	3.82
8	6.23	5.86	5.54	5.22	4.92	4.64	4.38
9	7.06	6.62	6.26	5.90	5.56	5.24	4.94
10	7.89	7.38	6.98	6.58	6.20	5.84	5.50
11	8.72	8.14	7.70	7.26	6.84	6.44	6.07
12	9.55	8.90	8.42	7.94	7.48	7.04	6.64
13	10.38	9.67	9.15	8.62	8.12	7.64	7.21
14	11.21	10.44	9.88	9.30	8.76	8.24	7.78
15	12.04	11.22	10.61	9.98	9.40	8.84	8.35
16	12.89	12.00	11.35	10.67	10.04	9.45	8.92
17	13.74	12.79	12.09	11.36	10.68	10.06	9.49
18	14.59	13.58	12.84	12.05	11.32	10.67	10.07
19	15.44	14.38	13.59	12.75	11.97	11.28	10.66
20	16.28	15.18	14.34	13.45	12.62	11.90	11.25
21	17.12	15.99	15.10	14.15	13.28	12.53	11.85
22	17.96	16.80	15.86	14.85	13.95	13.17	12.46
23	18.80	17.61	16.62	15.56	14.63	13.82	13.08
24	19.65	18.43	17.38	16.27	15.32	14.48	13.71
25	20.50	19.25	18.15	16.98	16.02	15.15	14.35
26	21.36	20.09	18.93	17.70	16.73	15.84	15.00
27	22.22	20.93	19.71	18.44	17.46	16.55	15.66
28	23.09	21.77	20.50	19.21	18.21	17.28	16.33
29	23.97	22.62	21.30	20.00	19.98	18.02	17.01
30	24.86	23.47	22.11	20.81	19.77	18.77	17.69
31	25.76	24.33	22.94	21.64	20.57	19.52	18.37
32	26.67	25.19	23.78	22.48	21.37	20.27	19.06
33	27.58	26.06	24.63	23.32	22.17	21.02	19.76
34	28.50	26.94	25.49	24.16	22.97	21.77	20.47
35	29.42	27.83	26.36	25.00	23.77	22.52	21.20
36	30.34	28.73	27.24	25.84	24.57	23.28	21.94
37	31.26	29.63	28.12	26.68	25.37	24.04	22.69
38	32.18	30.53	29.00	27.52	26.17	24.80	23.45
39	33.10	31.43	29.88	28.36	26.97	25.57	24.22
40	34.02	32.33	30.76	29.20	27.77	26.35	25.00

TABLE VII. SUMMARY OF UNEMPLOYMENT SURVEYS IN SELECTED CITIES, 1915

City	Number of families canvassed	Number of wage earners	Wage earners per family (m)	Per cent of wage earners unemployed (q)	Per cent of families with unemployment (Q)	Theoretical probability ¹		Ratio $q \div q'$ in per cent
						(q') Corresponding to the returned (Q) in per cent	(Q') Corresponding to the returned (q) in per cent	
NEW YORK								
February	54,849	95,443	1.74	16.2	21.4	13.3	25.7	121.8
September	56,539	97,741	1.73	6.7	9.7	5.7	11.0	117.5
EAST AND MIDDLE WEST CITIES (March-April 1915)								
Boston, Mass.	46,649	77,419	1.66	10.2	14.1	8.9	16.0	114.6
Bridgeport, Conn.	8,144	12,533	1.54	4.3	6.1	4.0	6.6	107.5
Chicago, Ill.	96,579	157,616	1.63	13.3	17.5	11.4	20.3	116.7
Cleveland, Ohio	16,851	24,934	1.48	9.4	11.6	8.2	13.4	114.6
Duluth, Minn.	1,383	2,089	1.51	20.3	24.7	17.9	27.9	113.4
Kansas City, Mo.	14,890	22,512	1.51	12.5	15.6	10.9	17.7	114.7
Louisville, Ky.	1,667	3,036	1.82	13.1	19.7	11.6	22.2	112.9
Milwaukee, Wis.	8,813	13,112	1.49	7.9	9.9	6.5	11.2	121.5
Minneapolis, Minn.	2,206	3,449	1.56	14.4	17.5	11.9	20.9	121.0
Philadelphia, Pa.	79,058	137,244	1.74	10.3	14.2	8.5	16.9	121.2
Pittsburgh, Pa.	36,544	53,336	1.46	11.1	13.6	9.7	15.4	114.4
St. Louis, Mo.	65,979	104,499	1.58	13.6	17.2	11.5	20.0	118.3
St. Paul, Minn.	2,515	4,135	1.64	14.1	17.9	11.5	21.5	122.6
Springfield, Mo.	1,584	2,284	1.44	7.1	8.4	6.1	9.9	116.4
Toledo, Ohio	7,233	10,312	1.43	10.7	12.8	9.4	14.6	113.8
Wilkes-Barre, Pa.	11,453	18,884	1.65	6.4	8.6	5.3	10.2	120.8
ROCKY MOUNTAIN AND PACIFIC COAST CITIES (June-July 1915)								
Butte, Mont.	3,557	4,229	1.19	7.0	7.6	6.5	8.2	107.7
Los Angeles, Cal.	5,621	7,227	1.29	11.4	13.1	10.5	14.1	108.6
Oakland, Cal.	2,927	4,256	1.45	12.0	15.1	10.5	16.5	114.3
Ogden, Utah	581	837	1.53	4.5	5.7	3.8	6.7	118.4
Portland, Oreg.	1,783	2,347	1.32	20.0	23.4	18.9	24.8	105.8
Sacramento, Cal.	1,288	1,856	1.44	9.2	11.8	8.6	12.7	107.0
Salt Lake City, Utah	1,052	1,664	1.58	10.4	14.3	9.4	15.7	110.6
San Diego, Cal.	1,466	1,828	1.25	16.7	18.3	15.2	20.0	109.9
San Francisco, Cal.	5,320	7,749	1.46	15.6	19.5	14.2	21.3	109.9
Seattle, Wash.	10,112	13,473	1.33	12.7	15.0	11.8	16.2	107.6
Spokane, Wash.	1,012	1,259	1.24	16.7	19.0	15.9	19.9	105.0
Tacoma, Wash.	1,818	2,558	1.41	17.9	21.3	16.2	23.3	110.5

¹ (q') and (Q') are calculated on the basis of the returned rates (q), (Q) and (m) with the help of the auxiliary Appendix Tables VI-A and VI-B. See Chapter XI for explanation of method of calculation.

Source: U. S. Bureau of Labor Statistics, *Unemployment in the United States*, Bulletin No. 195, July 1916.

TABLE VIII. ESTIMATED DISTRIBUTION OF GAINFUL WORKERS IN FARM AND NON-FARM FAMILIES, BY SEX, AGE AND FAMILY STATUS, IN THE UNITED STATES, 1930
(In thousands)

Age-classes	All gainful workers	In farm families				In non-farm families		
		Total	Family heads	Unpaid family members	Other	Total	Family heads	Other
<i>Male</i>								
Total	38,078	9,562	5,801	1,185	2,576	28,516	18,438	10,078
10-24 years	7,824	2,461	358	1,044	1,059	5,363	908	4,455
25-34 years	9,169	1,728	1,145	88	495	7,441	4,575	2,866
35-44 years	8,608	1,745	1,466	22	257	6,863	5,446	1,417
45-54 years	6,565	1,647	1,404	10	233	4,918	4,138	780
55-64 years	3,942	1,201	958	8	235	2,741	2,362	379
65-74 years	1,643	628	378	9	241	1,015	910	105
75 and over	296	147	90	4	53	149	91	58
Unknown	31	5	2	—	3	26	8	18
<i>Female</i>								
Total	10,752	914	263	651	—	9,838	1,563	8,275
10-24 years	4,011	382	13	369	—	3,629	75	3,554
25-34 years	2,654	129	—	—	—	2,525	—	—
35-44 years	1,892	134	111	152	—	1,758	661	3,622
45-54 years	1,266	129	—	—	—	1,137	—	—
55-64 years	650	85	—	—	—	565	—	—
65-74 years	227	42	139	129	—	185	826	1,100
75 and over	39	12	—	—	—	27	—	—
Unknown	13	—	—	—	—	13	—	—

Source: Estimated as explained in Chapter XIII.

TABLE IX. UNEMPLOYMENT IN SELECTED URBAN AREAS, ON APRIL 1, 1930 AND IN JANUARY 1931
(Classes A and B unemployed)

Urban areas canvassed in January 1931	April 1, 1930		January 1931		Increase in per cent	
	Male	Female	Male	Female	Male	Female
TOTAL	761,072	153,050	1,818,968	479,283	139.0	213.2
Boston	28,477	6,537	69,229	19,561	143.1	199.2
Buffalo	19,945	2,946	63,276	10,461	217.3	255.1
New York						
Bronx Borough	40,537	8,966	86,594	23,015	113.6	156.7
Brooklyn Borough	79,306	15,227	191,998	48,557	142.1	218.9
Manhattan Borough	71,222	18,385	135,467	45,836	90.2	149.3
Philadelphia	67,299	17,342	186,672	59,865	177.4	245.2
Pittsburgh	23,094	3,098	65,884	13,542	185.3	337.1
Cleveland	43,660	6,575	103,665	21,159	137.4	221.8
Dayton	6,457	1,315	17,607	3,859	172.7	193.5
Chicago	141,065	26,869	353,980	96,264	150.9	258.3
Detroit	81,006	10,991	190,107	33,382	134.7	203.7
Duluth	5,371	549	8,001	1,450	49.0	164.1
Minneapolis	13,500	2,900	31,032	7,830	129.9	170.0
St. Louis	28,902	6,243	70,831	21,735	145.1	248.1
Birmingham	5,445	1,297	20,230	7,615	271.5	487.1
New Orleans	15,789	3,993	34,151	14,561	116.3	264.7
Houston	6,898	1,772	22,302	9,786	223.3	452.3
Denver	9,022	1,775	17,989	4,423	99.4	149.2
Seattle	12,677	2,285	29,792	5,312	135.0	132.5
Los Angeles	40,566	10,352	82,085	23,135	102.3	123.5
San Francisco	20,834	3,633	38,076	7,935	82.8	118.4

Source: Fifteenth Census of the United States: 1930, Unemployment, Vol. II, pp. 370-73.

TABLE X. UNEMPLOYMENT IN PHILADELPHIA BY SIZE-CLASSES OF FAMILIES,
FROM 1931 TO 1938

A. DISTRIBUTION OF CANVASSED FAMILIES BY NUMBER OF GAINFUL WORKERS

Number of gainful workers in a family	1931	1932	1933	1935	1936	1937	1938
<i>Absolute numbers</i>							
All families	36,410	35,471	35,820	43,997	44,817	45,927	45,715
None	818	865	934	1,839	2,329	2,521	2,662
1 worker	17,565	16,672	17,271	21,164	20,604	21,887	23,593
2 workers	9,710	9,287	9,245	11,695	12,287	12,233	11,238
3 workers	4,935	5,046	4,781	5,462	5,705	5,622	5,055
4 workers	2,192	2,298	2,266	2,413	2,521	2,417	2,077
5 workers	800	857	900	933	926	861	784
6 workers and over	390	446	423	441	445	386	306
<i>Percentage distribution</i>							
All families	100.0	100.0	100.0	100.0	100.0	100.0	100.0
None	2.3	2.4	2.6	4.2	5.2	5.5	5.8
1 worker	48.2	47.0	48.2	48.1	46.0	47.6	51.6
2 workers	26.7	26.2	25.8	26.6	27.4	26.6	24.6
3 workers	13.6	14.2	13.4	12.4	12.7	12.2	11.1
4 workers	6.0	6.5	6.3	5.5	5.6	5.3	4.6
5 workers	2.2	2.4	2.5	2.2	2.1	1.9	1.7
6 workers and over	1.0	1.3	1.2	1.0	1.0	0.9	0.6

B. DISTRIBUTION OF CANVASSED FAMILIES BY NUMBER OF GAINFUL WORKERS AND EMPLOYMENT STATUS

Year and employment status of families	Number of families with gainful workers	Number of families with the specified number of gainful workers				
		1	2	3	4	5 or over
1931						
ALL FAMILIES	35,592	17,565	9,710	4,935	2,192	1,190
Completely employed	23,841	14,637	6,048	2,224	667	265
Partially unemployed	7,499	—	2,797	2,408	1,415	879
Completely unemployed	4,252	2,928	865	303	110	46
1932						
ALL FAMILIES	34,606	16,672	9,287	5,046	2,298	1,303
Completely employed	17,056	11,725	3,744	1,166	315	106
Partially unemployed	9,382	—	3,615	3,055	1,688	1,024
Completely unemployed	8,168	4,947	1,928	825	295	173
1933						
ALL FAMILIES	34,886	17,271	9,245	4,781	2,266	1,323
Completely employed	16,192	11,463	3,472	930	249	78
Partially unemployed	9,030	—	3,430	2,916	1,637	1,047
Completely unemployed	9,664	5,808	2,343	935	380	198
1935						
ALL FAMILIES	42,158	21,164	11,695	5,462	2,413	1,424
Completely employed	24,790	16,062	6,055	1,903	566	204
Partially unemployed	9,460	—	3,782	2,957	1,609	1,112
Completely unemployed	7,908	5,102	1,858	602	238	108
1936						
ALL FAMILIES	42,488	20,604	12,287	5,705	2,521	1,371
Completely employed	25,453	15,725	6,660	2,188	655	225
Partially unemployed	9,798	—	3,920	3,066	1,714	1,098
Completely unemployed	7,237	4,879	1,707	451	152	48
1937						
ALL FAMILIES	43,406	21,887	12,233	5,622	2,417	1,247
Completely employed	28,959	17,325	7,764	2,699	861	310
Partially unemployed	8,235	—	3,263	2,579	1,472	921
Completely unemployed	6,212	4,562	1,206	344	84	16
1938						
ALL FAMILIES	43,053	23,593	11,238	5,055	2,077	1,090
Completely employed	25,346	17,346	5,782	1,664	435	119
Partially unemployed	9,187	—	3,834	2,931	1,495	927
Completely unemployed	8,520	6,247	1,622	460	147	44

Sources: Gladys L. Palmer, *Recent Trends in Employment and Unemployment in Philadelphia*, pp. 44-46; *Employment and Unemployment in Philadelphia in 1936 and 1937*, Part II, pp. 8, 9 (Philadelphia: Works Progress Administration); Gladys L. Palmer and Samuel M. Cohn, *Employment and Unemployment in Philadelphia, July-August 1938* (Philadelphia: University of Pennsylvania Press), Special Report No. 7, pp. 6, 31.

TABLE XI. EMPLOYMENT AND UNEMPLOYMENT IN FAMILIES CLASSIFIED BY NUMBER OF ADULTS, IN DETROIT, MICHIGAN, AND BOSTON, MASSACHUSETTS, IN THE WINTER OF 1935-36

A. DISTRIBUTION OF FAMILIES BY THE EMPLOYMENT STATUS OF THE HEAD AND NUMBER OF GAINFUL WORKERS

Employment status of the head and number of adults in the family	Number of canvassed families	Number of families with the specified number of gainful workers						
		0	1	2	3	4	5	6 or over
<i>Detroit, Michigan</i>								
GRAND TOTAL ¹	27,872	2,578	19,861	3,933	1,016	365	75	44
FAMILIES WITH EMPLOYED HEADS								
Total	20,984	—	16,896	3,080	715	219	49	25
None	1	—	1	—	—	—	—	—
1 adult	4,644	—	4,644	—	—	—	—	—
2 adults	12,472	—	11,024	1,446	2	—	—	—
3 adults	2,185	—	999	1,092	94	—	—	—
4 adults	1,101	—	203	456	412	30	—	—
5 adults	412	—	24	78	180	123	7	—
6 adults or over	169	—	1	8	27	66	42	25
FAMILIES WITH UNEMPLOYED HEADS								
Total	3,056	—	2,204	524	198	103	16	11
1 adult	915	—	915	—	—	—	—	—
2 adults	1,331	—	1,135	196	—	—	—	—
3 adults	402	—	128	243	29	2	—	—
4 adults	222	—	25	68	119	10	—	—
5 adults	115	—	1	11	39	64	—	—
6 adults or over	71	—	—	6	11	27	16	11
FAMILIES WITH UNEMPLOYABLE HEADS								
Total	3,832	2,578	761	329	103	43	10	8
None	239	239	—	—	—	—	—	—
1 adult	1,913	1,912	1	—	—	—	—	—
2 adults	953	384	568	1	—	—	—	—
3 adults	422	38	161	223	—	—	—	—
4 adults	175	3	26	82	64	—	—	—
5 adults	81	2	5	20	33	21	—	—
6 adults or over	49	—	—	3	6	22	10	8

TABLE XI—Continued

Employment status of the head and number of adults in the family	Number of canvassed families	Number of families with the specified number of gainful workers						
		0	1	2	3	4	5	6 or over
<i>Boston, Massachusetts</i>								
GRAND TOTAL¹	39,623	6,526	24,597	5,037	2,207	857	277	122
FAMILIES WITH EMPLOYED HEADS	24,099	—	18,674	3,303	1,347	532	168	75
Total	1	—	1	—	—	—	—	—
1 adult	7,402	—	7,401	1	—	—	—	—
2 adults	11,376	—	10,022	1,354	—	—	—	—
3 adults	2,532	—	1,003	1,314	215	—	—	—
4 adults	1,581	—	1,214	520	774	73	—	—
5 adults	1,736	—	30	99	291	301	15	75
6 adults or over	471	—	3	15	67	158	152	—
FAMILIES WITH UNEMPLOYED HEADS	5,819	1	4,206	870	460	187	67	28
Total	1	—	1	—	—	—	—	—
1 adult	1,752	—	1,750	1	—	—	—	—
2 adults	2,564	—	2,221	342	1	—	—	—
3 adults	624	—	194	363	67	—	—	—
4 adults	462	—	33	137	274	18	—	—
5 adults	234	—	7	22	95	106	4	28
6 adults or over	182	—	—	5	23	63	63	—
FAMILIES WITH UNEMPLOYABLE HEADS	9,705	6,525	1,717	864	400	138	42	19
Total	271	271	—	—	—	—	—	—
1 adult	5,232	5,229	3	—	—	—	—	—
2 adults	2,208	926	1,281	1	—	—	—	—
3 adults	1,044	89	363	592	—	—	—	—
4 adults	1,540	10	61	224	245	—	—	—
5 adults	248	—	8	39	120	81	—	—
6 adults or over	162	—	1	8	35	57	42	19

¹ Excluding families with the employment status of the head unknown.

TABLE XI—Continued

B. DISTRIBUTION OF EMPLOYED AND UNEMPLOYED FAMILY MEMBERS BY THE EMPLOYMENT STATUS OF THE HEAD

Employment status of the head and number of adults in the family	Number of canvassed families	Wives				Other family members			
		Total	Gainful workers	Employed	Unem- ployed	Total	Gainful workers	Employed	Unem- ployed
<i>Detroit, Michigan</i>									
GRAND TOTAL ¹	27,872	18,300	1,517	1,429	88	33,088	7,328	5,330	1,998
FAMILIES WITH EMPLOYED HEADS									
Total	20,984	15,754	1,316	1,261	55	25,097	4,178	3,112	1,066
None	1	—	—	—	—	—	—	—	—
1 adult	4,644	—	—	—	—	465	—	—	—
2 adults	12,472	12,074	1,177	1,124	53	14,173	273	209	64
3 adults	2,185	2,059	91	89	2	4,381	1,189	891	298
4 adults	1,101	1,061	38	38	—	3,380	1,332	982	350
5 adults	412	399	8	8	—	1,709	827	618	209
6 adults or over	169	161	2	2	—	989	557	412	145
FAMILIES WITH UNEMPLOYED HEADS									
Total	3,056	1,989	157	135	22	4,363	1,195	738	457
1 adult	915	—	—	—	—	193	—	—	—
2 adults	1,331	1,243	133	111	22	1,703	63	42	21
3 adults	402	359	13	13	—	891	294	180	114
4 adults	222	206	5	5	—	708	331	195	136
5 adults	115	112	4	4	—	456	277	162	115
6 adults or over	71	69	2	2	—	412	230	159	71
FAMILIES WITH UNEMPLOYABLE HEADS									
Total	3,832	557	44	33	11	3,628	1,955	1,480	475
None	239	—	—	—	—	35	—	—	—
1 adult	1,913	—	—	—	—	532	1	1	—
2 adults	953	327	35	26	9	957	535	422	113
3 adults	422	116	8	6	2	914	599	448	151
4 adults	175	63	1	1	—	555	381	286	95
5 adults	81	27	—	—	—	356	228	161	67
6 adults or over	49	24	—	—	—	279	211	162	49

TABLE XI—Continued

Employment status of the head and number of adults in the family	Number of cavassed families	Wives				Other family members			
		Total	Gainful workers	Employed	Unem- ployed	Total	Gainful workers	Employed	Unem- ployed
<i>Boston, Massachusetts</i>									
GRAND TOTAL ¹	39,623	20,456	1,228	1,132	96	48,005	15,723	9,920	5,803
FAMILIES WITH EMPLOYED HEADS									
Total	24,099	15,396	897	866	31	29,718	7,774	5,139	2,635
None	1	—	—	—	—	—	—	—	—
1 adult	7,402	—	—	—	—	464	1	1	—
2 adults	11,376	10,560	758	730	28	13,805	608	456	152
3 adults	2,532	2,214	76	74	2	5,159	1,671	1,103	568
4 adults	1,581	1,471	43	43	—	4,674	2,231	1,457	774
5 adults	736	697	14	13	1	3,008	1,631	1,049	582
6 adults or over	471	454	6	6	—	2,608	1,632	1,073	559
FAMILIES WITH UNEMPLOYED HEADS									
Total	5,819	3,722	233	181	52	9,495	2,534	1,091	1,443
None	1	—	—	—	—	—	—	—	—
1 adult	1,752	—	—	—	—	206	1	—	1
2 adults	2,564	2,355	190	146	44	4,169	168	75	93
3 adults	624	542	25	20	5	1,515	476	184	292
4 adults	462	429	11	9	2	1,533	714	288	426
5 adults	234	225	4	3	1	1,022	540	240	300
6 adults or over	182	171	3	3	—	1,050	635	304	331
FAMILIES WITH UNEMPLOYABLE HEADS									
Total	9,705	1,331	98	85	13	8,792	5,415	3,690	1,725
None	271	—	—	—	—	45	—	—	—
1 adult	5,232	—	—	—	—	970	1	1	—
2 adults	2,208	737	71	63	8	2,081	1,216	899	326
3 adults	1,044	253	20	16	4	2,128	1,516	1,041	475
4 adults	540	165	5	4	1	1,643	1,234	801	433
5 adults	248	104	1	1	—	1,013	769	519	250
6 adults or over	162	72	1	1	—	912	679	438	241

¹ Excluding families with the employment status of the head unknown.

Source: Federal Security Agency, Social Security Board, *Statistics of Family Composition in Selected Areas of the United States*, Vol. I, Detroit, pp. 40-42, 57-68; Vol. II, Boston, pp. 40-42, 59-70.

INDEX

ACCESSIONS, *see* Turnover

Additional workers: and business conditions, 105-06, 110, 111-13, 144, 175; and unemployment estimates, 107-10, 112n, 167, 168; defined, 105-06; effect on number of workers per family, 116, 118, 135-38; married women, 121, 123, 156, 171-72, 186, 193; method of estimating, 115-19, 126-43; number of, 121, 122, 164, 171, 172, 179, 194, 205, 210, 215, 216; ratio to unemployed usual earners, 109, 120, 122, 123, 124, 131-35, 136-38, 148-49, 171, 176, 177, 180, 191-93, 210; ratio to usual earners, 136-38, 148-49, 176, 177, 178, 182; *see also* Unemployment, secondary

Agricultural labor, 105, 151, 152, 153, 154, 203, 204, 206, 240

Alexander Hamilton Institute, 107

American Federation of Labor: unemployment estimates, 86, 107

Anker, John, 42n.

BERRIDGE, W. A., 29n, 30n

Brissenden, Paul F., 6n, 7, 12n, 19n, 20n, 21n, 22n, 23, 25

Bureau of the Census, 201-04

Business conditions, *see* Additional workers; Unemployment

Byer, Herman B., 42n

CENSUSES, *see* under Unemployment

Clague, Ewan, 176n

Cleveland Trust Co., 107

Cohn, Samuel M., 173n

Croxtton, Frederic E., 82n, 83

DANILEVSKI, N., 210n

Dewhurst, J. F., 173n

Douglas, Paul H., 78, 79, 111

EMMET, BORIS, 12n

Employers, *see* Management

Employment: BLS indexes, 9-11, 30-33, 35, 37-38, 45-47, 52, 108, 150-51, 167-68, 198, 203, 204, 216-17, 229, 231; censuses of manufactures, 43-47; "derived" index, 10-11, 17, 31, 43, 45-47, 56, 227, 229, 231; seasonal variations, 37-38, 105-06

FALKNER, R. P., 108n

Families: bio-legal, 184-85, 187; employment status of head, 186-87, 242-45; farm and non-farm, 157-59, 240; number of adults, 184-85, 187, 188, 242-45; number of members, 186-89; number of unemployed usual earners, 241; number of usual earners, 241-43; with unemployment, 219-23, 238, 239, 241; *see also* Unemployment

Family Composition Study, 184-94

Family relationship, *see* Labor force; Unemployed

Florence, P. Sargant, 23n, 25n

Forced entries, *see* Additional workers

Frankel, Emil, 6n, 7, 12n, 19n, 20n, 21n, 22n, 23n, 25

GIVENS, MEREDITH B., 79

HARD-CORE, *see* Unemployed, long-time; Unemployment

Humphrey, Don D., 116n

KIRK, W. F., 12n

Kuvin, Leonard, 108n, 199n

LABOR FORCE: by family relationship, 156-59, 240; by length of service, 24-28, 39-41; cyclical changes, 9, 86-87, 106, 110, 111-12, 115; demand for, 2, 3, 5, 12-13, 17, 19, 33, 42, 49, 52, 68, 78, 90, 102, 105-06, 108; interstate migration, 115; married women, 110-12, 127; retirements, 87, 110; seasonal variations, 9, 105, 110-11; supply of, 16, 27-28, 106, 110-12, 154, 161, 166-67, 171, 172, 178, 199, 203, 204, 207; trends in, 1-5, 12-13, 15, 29, 54-55, 105-07, 110; *see also* Skilled, Stable, Unskilled, Unstable workers

Lazarfeld, Paul F., 112

MANAGEMENT: employment policies, 2-5, 6, 42, 49, 54-55, 60

Manufacturing industries: turnover rates, 3, 4, 29-34, 47-51, 64, 151, 198, 227, 228, 230, 232, 236-37

Married women, *see* Additional workers; Labor force

- Metropolitan Life Insurance Company :
surveys of, 8n, 13, 29-31, 39-41, 43,
47n, 80
- NATHAN, ROBERT R., 86, 107, 111n,
167n, 173n, 199-200, 216
- National Conference of Employment
Managers, 6, 12
- National Industrial Conference Board,
107, 112n, 216
- New workers, 62, 86, 87, 105, 110,
205-06
- Newly hired workers, 2, 24, 26, 39, 60
- Newly separated workers, 213; attitude
toward unemployment, 15-16,
64-65, 89; method of estimating, 73-
74, 77; reemployment chances, 87-
88; under-enumeration of, 64-65, 69,
80-84, 89-92, 94, 164, 166, 203n
- Nixon, R. A., 108n
- PALMER, GLADYS L., 99n, 173n
- Part-time workers, 62, 69, 89, 91-92
- Powell, Webster, 176n
- ROCHESTER METHOD, 6-9, 29
- SAMUELSON, P. A., 108n
- Seasonal variations, *see* Employment;
Labor force; Turnover
- Separations, *see* Turnover
- Skilled workers, 2, 23, 147, 153
- Slichter, Sumner H., 8n, 11n, 12,
20n, 23n
- Social Security Board: employment
records, 204, 217; family composition
study, 184-94
- Stable workers, 2-3, 4, 23-28, 39-41, 60
- Stinebower, L. D., 78, 79
- Stouffer, Samuel A., 112
- Supplementary workers, 105n, 126-27,
147-48, 164, 187-93, 244-45
- THOMPSON, WARREN, 115n
- Tupper, E. A., 173n
- Turnover: accessions, 1, 2, 3-4, 15-19,
30-38, 47, 49-51, 56, 227, 228, 230,
232, 236-37; by age, 23; by cities,
22; by industries, 14, 22, 58, 232-35,
236-37; by length of service, 23-28,
39-41, 60; by sex, 23; by size of
establishment, 21-22, 43-44, 59, 236-
37; by working conditions, 23; dis-
charges, 4-5, 36, 38n, 52, 228, 230,
232, 236-37; discharges defined, 8;
layoffs, 3, 4, 5, 36, 38n, 42, 49-50,
52, 54, 56, 60, 64, 68, 228, 230, 232,
236-37; layoff defined, 8; measure-
ment of, 5, 7, 9-11, 13, 29-30; quits,
2-5, 29, 31, 32, 36, 38n, 42, 49-50,
52-55, 56, 60, 64, 68, 87, 228, 230,
232, 236-37; quits defined, 4-5, 8;
seasonal variations, 19-20, 21, 36-
38, 55-57; separations, 1, 2-4, 15-19,
29, 30-38, 47, 49-56, 64, 69-71, 227,
228, 230, 232, 236-37, classification
of, 7-8
- UNEMPLOYED: by age, 121, 127, 153-
55, 170-71, 174, 207-08, 212; by class
of work, 147-48, 151-53; by dura-
tion of idleness, 61-63, 66-67, 69-77,
81, 83, 90, 91, 92, 93, 95, 96, 98, 100,
101, 120-21, 161-64; by employment
status of family head, 123, 178-79,
190-91, 223-25, 244-45; by families,
144-48; by family relationship, 156-
64, 178-79; by family status, 128-29,
160; by industries, 206-07; by mar-
ital status, 155-56, 171-72, 185-86; by
sex, 121-22, 147, 152, 153-55, 161,
168-70, 207-08, 212; long-time, 66,
67, 69, 74, 88, 90, 92, 93, 97-99,
see also Hard-core; reemployment
chances, 66-68, 72, 74, 75, 84-85, 93,
95, 97, 100-03; short-time, 66-67, 69,
70, 74, *see also* Newly separated
workers; turnover concept, 62-63,
67-68; *see also* Unemployment
- Unemployment: and business condi-
tions, 64, 66-68, 69, 70, 72, 82-83, 124,
196, 198, 214; by size of family, 116,
118-19, 122-23, 126-31, 135-43, 146-
47, 173, 177-83, 190-91, 209-10, 219-
23, 241; census data limitations, 61-
62, 66, 107, 115-16, 128-29, 144, 151;
differential rates of, 115-16, 118-20,
126-28, 131-35, 138-43, 152, 212-14,
223-25; estimates, 78-79, 86-87, 107-
10, 124-25, 167-68, 216; extent of, 3,
33, 64, 78-80, 86-87, 99-100, 166-67,
193-94, 195, 199, 204, 210, 211, 215-
17; hard-core, 63, 64, 66-68, 69, 79-
80, 82, 84-85, 88, 93, 95, 99, 102;
hard-core, method of measuring, 74-
77; in Buffalo, 75-77, 94-97; in
Columbus, 82-85; in Lincoln, 97-99;
in Philadelphia, 99-103, 122-23, 126,
135, 173-83, 223-25, 241; in 1915,
80-82, 119-20, 144-49, 239; in 1931,
65, 90-93, 121-22, 124, 165-72, 199-
200, 208-09, 216, 240; in 1935-36,
123, 200, 216, 242-45; in 1937, 112,
123-25, 195-217; 1930 census, 65,
88-89, 120-21, 124, 150-64, 165-72,
185, 199, 206, 207-08, 216; 1940
census, 124, 200-05, 206, 216; in-
fluence on reemployment, 61, 67-68;
negative, 79, 86-87, 106n, 109, 111;

- primary, 107, 110, 114-16, 128, 135-43, 148, 172, 177, 179-80, 181, 194, 209, 215, 216; proportion of families with, 117-18, 119, 122, 129-32, 145-48, 175-78, 183, 238, 239; rates, by family status, 120-21; seasonal, 215; secondary, 105n, 107, 110, 114-19, 128, 135-43, 148, 172, 177-80; technological, 87, 106; *see also* Unemployed
- U. S. Bureau of Labor Statistics: stable and unstable workers, 24-26; turnover statistics, 4, 6-9, 11-14, 42-47, 58, 60, 64; unemployment surveys, 80; *see also* Employment; Turnover
- U. S. Public Health Service: national health survey, 123, 124, 184-94
- University of Pennsylvania, 99, 126n, 173
- Unskilled workers: turnover rates, 2, 23
- Unstable workers, 16n; turnover rates, 2-3, 4, 23-28, 29, 39-41, 60
- VANCE, R. B., 210n
- Voluntary registration, *see* Unemployment, in 1937
- WHELPTON, P. K., 115n
- Winslow, Harry J., 75n
- Wolman, Leo, 79
- Works Progress Administration, 99, 173
- Woytinsky, W. S., 17n, 37n, 43n, 56n, 107n, 116n, 152n, 206n, 216n