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FACTORY LABOR TURNOVER IN MICHIGAN

BY

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AUTHOR'S NOTE

During the past year the Bureau of Business Research has cooperated with Michigan firms in the collection and analysis of labor turnover facts. Individual reports have been returned each month to the cooperating companies but heretofore no collection of all the data has been attempted. With the completion of its first year of experience in this field the Bureau submits a summary of the data and an analysis of the leading conclusions.

It would be a great pleasure to acknowledge individually the companies which have associated themselves with the Bureau in this activity. Because of the Bureau's arrangements to keep the names of contributors confidential, this is impossible. The value of their service is, however, fully appreciated.

Special acknowledgement is due the Metropolitan Life Insurance Company which has assisted in many ways to make the collection of data a success. The Metropolitan Life Insurance Company was instrumental in organizing the collection of labor turnover statistics throughout the country and contributes its national averages for use in this bulletin.

Most of the calculations used in the bulletin have been done by Mr. T. A. Veenstra of the Bureau's staff.

CONTENTS

CONCLUSIONS

1. Labor turnover rates differ between regions and between industries. These differences may have their origin in seasonal and cyclical changes in the labor market or in fundamental factors which cause permanent differences in the level of turnover rates. The incidence of these forces may be seen by a study of turnover rates in Grand Rapids and Detroit. The monthly quit rate in Grand Rapids is normally lower than the rate in Detroit. The difference between them has, however, varied from a small margin during the automotive slump of late 1927 to a very large margin during the active months of 1928.

2. The existence of high average rates of labor turnover in a district or industry does not necessarily imply unfavorable conditions. Such rates merely show that labor differences exist and that individual companies should compare their own figures with local or industrial averages to obtain the greatest benefit from the comparison. Michigan rates are higher than the average rates of the whole country, a situation probably characteristic of any rapidly growing section.

3. In general a company's quit rate and discharge rate reflect its personnel policy and measure the efficiency of its personnel administration. Numerous exceptions, however, may occur. For example, if the age distribution of employees is unsatisfactory, high discharge rates show only an effort to correct the situation, or a high discharge rate may reflect a wise move to correct some past inefficiency in the selection of employees. In some cases it may be financially profitable for a company to have a rapidly changing work force rather than to adjust its affairs in such a way as to attract a stable personnel. Despite these and probably other exceptions an extraordinary quit or discharge rate suggests inefficient personnel administration.

4. Company turnover rates show inertia. That is, companies with rates above average tend to stay above average for considerable

periods and companies with low rates tend to remain low for equally long intervals. It is unusual to see a company fluctuate from month to month, sometimes far above average rates and sometimes far below.

5. The study shows that in making comparisons of company turnover rates with standard rates the following suggestions may be followed:

a. A company quit rate that is more than 50% below or 80% above average should be regarded as unusual. Approximately half the cases fall within these limits. A similar rule should be used for analyzing discharge rates.

b. The most significant comparisons to be made of the labor turnover rates of a particular company are with the average rates for the district and industry in which the company operates, rather than with the general state and national averages.

c. One month's figures are influenced by those of the preceding month and should not, therefore, be interpreted alone. Annual or semi-annual comparisons should supplement the monthly study of rates.

d. No criticism should attach to the employment department on account of exceptionally large lay-offs, which the department is obviously powerless to control. No criticism of a personnel department should be made on account of discharge or quit rates unless the department is in complete control of employment and discharge.

6. As an important by-product of the study of labor turnover there is made available an index of employment in the state. This index may be linked to the index furnished for earlier years by the Industrial Conference Board[1] to provide a continuous index from 1920 to date.

INTRODUCTION

The material presented in this bulletin is the outgrowth of a statistical reporting service undertaken by the Bureau of Business Re-

[1]See Michigan Business Studies, Vol. I, No. 7, page 11.

search to provide business men with up-to-date information regarding factory labor turnover in Michigan. The reporting service was organized in August, 1927, following a conference of personnel executives of the state at which the subject of labor turnover was considered. It was discovered at this conference that no mutual agreement could be reached regarding the amount of labor turnover to be expected of an efficiently operated firm in Michigan and that there were no figures available to test the various guesses that were ventured on the subject. The reporting activities of the Bureau were a direct effort to meet the need for prompt and reliable facts about labor turnover in the state.

With the completion of its first year of experience in this field the Bureau presents here a summary of the data and an examination of the major conclusions. The number of firms which have cooperated in the collection of labor data has varied a little from month to month. Table 1 shows the number of reports received in a typical month and the number of employees included.

TABLE 1—NUMBER OF LABOR REPORTS RECEIVED IN JUNE, 1928 AND NUMBER OF EMPLOYEES REPRESENTED, CLASSIFIED BY DISTRICT AND BY INDUSTRY

District	No. of Reports	No. of Employees	Industry	No. of Reports	No. of Employees
Battle Creek	6	4366	Automobiles and Accessories	24	73533
Detroit	25	70117	Forges and Foundries	12	6624
Flint	4	1499	Paper	4	2188
Grand Rapids	9	5979	Furniture	14	4989
Jackson	9	3545	Machine and Tool	20	8831
Kalamazoo	7	2932	Public Utilities	6	12158
Lansing	5	11351	Food Products	2	2547
Muskegon	4	2285	All Others	13	2408
Saginaw	6	2500			
Small Towns	13	3113			
Not Classified	7	5591			
Total	95	113278	Total	95	113278

It is obviously impossible to obtain labor reports from all firms operating in Michigan because many do not keep adequate records and many consider the information too confidential for release. It

is gratifying under these circumstances to find that around a hundred firms employing not far from a sixth of the factory workers of the state are able and willing to release their figures for scientific purposes.[2] No other area of equal size has yet furnished so representative a picture of its labor situation. The interest which employment managers have taken in the collection of labor data is encouraging evidence of a progressive attitude among Michigan employers.

The work of the Bureau of Business Research consists only in assembling the labor reports and making the calculations necessary for rendering the reports useful. Every month the Bureau computes for each firm the voluntary quit rate, the discharge rate, the lay-off rate, and the hiring rate. From the individual company rates the Bureau calculates average rates for various industries and districts and reports these averages to the individual companies to be used as standards of comparion for appraising company experience. These averages are the chief subject of analysis here.

STATISTICAL PROCEDURE

In order that the sections which follow may be fully understood, a description is given here of the method by which the Bureau carries on its work of collection, calculation, and report. On the first of each month the Bureau sends to each of the cooperating companies a form for reporting its labor figures. A report of this type, filled in by a Michigan company, is reproduced as Form 1 on the opposite page. These reports are coded so that all figures received by the Bureau are identified only by number and are handled as confidential. On the reporting blank each company returns the following information: the average number of persons employed during the reporting period,[3] the

[2] A more accurate statement of the relative size of the Bureau's sample is impossible because the latest census is for 1925 and because the Bureau classification of industries cannot be made identical with that of the census. The latest figures show 515494 wage earners employed in manufacturing in Michigan. When allowance is made for the growth of employment and the difference in classification, it seems probable that the sample used here is between 15 and 20 percent of the total factory working force.

[3] If this figure is not available the Bureau estimates it from the number on payroll at the beginning and end of the period.

FORM 1—FORM RECEIVED BY THE BUREAU OF BUSINESS RESEARCH

2440 10-28 334

ORIGINAL

To be filled in by reporting firm

Code No. D-1046

BUREAU OF BUSINESS RESEARCH
SCHOOL OF BUSINESS ADMINISTRATION
UNIVERSITY OF MICHIGAN
ANN ARBOR, MICHIGAN

TURNOVER OF FACTORY LABOR FOR MONTH OF Feb. 1935

Please Be Sure To indicate by check whether this report covers

- [x] Calendar month
- [ ] Four weeks
- [ ] Five weeks

IMPORTANT Figures should refer to *FACTORY WORKING FORCE ONLY*

1. AVERAGE NUMBER OF EMPLOYEES ON PAYROLL DURING PERIOD 718
   a. NUMBER AT BEGINNING OF PERIOD . . . . . —
   b. NUMBER AT END OF PERIOD . . . . . —
   (Answer (1) providing that figure is available from your records; if it is not fill in items (a) and (b) and we will estimate the average from them).
2. NUMBER QUITTING VOLUNTARILY DURING THE PERIOD 10
3. NUMBER DISCHARGED DURING THE PERIOD 9
   (To include only those discharged for reasons *other* than lack of work)
4. NUMBER LAID OFF DURING THE PERIOD 2
   (Refers to persons laid off because of lack of work whom you stand ready to call back as production demands)
5. NUMBER HIRED DURING THE PERIOD 20
   (Both first employment and re-hires)

COMMENTS ON ANY SPECIAL INCIDENTS AFFECTING YOUR FIGURES THIS MONTH:

A. B. C.
Initials of compiler

THIS REPORT SHOULD BE AT THE BUREAU OFFICE BY THE *TENTH* OF THE MONTH

number hired during the period, the number who quit, the number discharged, and the number laid off on account of lack of work.

From the figures reported the Bureau computes labor turnover rates by expressing the hirings, quits, discharges, and lay-offs as percentages of the average number employed. For example, the company whose figures are illustrated on Form 1 has rates as follows:

TABLE 2—TURNOVER RATES FOR COMPANY NO. D-1046 IN FEBRUARY, 1928

Figures Reported		Company Turnover Rates
Average on Payroll	718	
Quits	10	1.4%
Discharges	9	1.3%
Lay-offs	2	0.3%
Total Separations	21	3.0%
Hirings	70	9.7%

The quit rate in this case is computed by dividing the quits by the average on payroll (and multiplying by 100 to remove the decimals): thus, $\frac{10}{718}$ (100) equals 1.4. Accordingly, during the reporting period this company lost 1.4 percent of its working force through voluntary quits. The total separation rate of 3.0 percent means that 3.0 percent of the working force separated from employment during the working period, either through voluntary action, discharge, or lay-off. Hiring rates are obtained in the same manner, so that a comparison is possible between the hiring rate and the separation rate, to show the relative increase or decrease of the working force. In this case, the company lost 3.0 percent of its force but hired 9.7 percent, showing a considerable increase during the month.[4]

After individual rates have been computed for each company, group averages are obtained. To accomplish this, the company records are first sorted by districts and typical figures obtained for each of the selected cities. The records are then resorted and typical figures chosen for each of seven selected industries. Finally a single figure is taken as typical of the whole state during the reporting month.

The averages selected are known as median rates. That is, they are the rates which have as many company rates above them as below.

[4]Reporting periods are rendered comparable before the rates are obtained; that is, four week periods or five week periods are reduced to the calendar month basis because most companies report for the latter period. This conversion is made by multiplying the company separations and hirings by the ratio of the number of days in the reporting period to the number of days in the calendar month.

For example, when the quit rate is selected for Detroit, the Detroit company records are sorted out and arranged in order of the size of the quit rate. If there are twenty-five companies reporting from Detroit, the rate selected is that of the thirteenth company from the head of the list. In this way, there are twelve companies with rates greater than the average and twelve companies with smaller rates. Any particular Detroit company may thus place its own rate approximately as it stands high or low in the array of comparable companies.[5]

Finally the Bureau makes a report on or about the twentieth of each month to each of the cooperating firms. This report shows directly in parallel columns the comparison of the company's own rates (quits, discharges, lay-offs, and hirings) with the average rates in the company's district, in its industry, in Michigan and in the United States.[6] Each company is able, therefore, to appraise its own labor turnover experience promptly by studying the relation of its own situation to the situation in the district and industry which touch it most closely. A comparison of this kind may be illustrated by the report that was received by Company D-1046, the computation of whose rates was discussed above. This comparison is shown in Form 2 on the following page.

The comparison shows that the company's turnover rates, though higher than the average rates of the country as a whole, were lower than the rates in Detroit, where the company is located, and were lower than average rates for the industry to which it belongs.

It will be seen from the above description that the Bureau does not obtain reports on all aspects of labor turnover but confines its activity to the collection of a few outstanding facts. The omissions are not an expression of the Bureau's judgment that other facts are unimportant. Many of the cooperating companies keep exhaustive records of separations classified by cause, by length of service, or by class of employment; some keep departmental turnover analyses. These records

[5]The choice of average depends partly on the desire of the Bureau to have its average rates comparable with the national averages which are selected by this method. The median has another advantage in that it is unaffected by extreme non-typical items.

[6]United States labor turnover rates are furnished by the Metropolitan Life Insurance Company.

FORM 2—FORM RETURNED TO COOPERATORS

Form 2458 10-28 3M

Code No. B-1046 _ _ __

BUREAU OF BUSINESS RESEARCH
SCHOOL OF BUSINESS ADMINISTRATION
UNIVERSITY OF MICHIGAN
ANN ARBOR, MICHIGAN

Labor Turnover Rates for Factory Force
During Month of **February** , 1928

Rates expressed as percentages of average on payroll

A. Separation Rates	Your Company %	Detroit District %	Industry No. 2 (Key Industry) %	State of Michigan %	United States %
1. Voluntary quit rate	1.4	3.7	3.8	2.2	1.1
2. Discharge rate	1.3	1.2	1.3	0.7	0.3
3. Lay off rate	0.3	2.0	2.3	1.1	0.7
4. Total separation rate	3.0	6.9	7.4	4.0	2.1
B. Hiring rate (including both first employment and re-hires)	9.7	10.6	17.5	6.2	2.4

Number of Michigan firms reporting

Number of factory workers represented

Classification of firms:

1. Automobile and Accessory Manufacturers
2. Forges and Foundries
3. Paper Manufacturers
4. Furniture Manufacturers
5. Machine and Tool Manufacturers
6. Public Utilities
7. Food Products
8. All Others

are often useful to particular companies and their more general adoption should be encouraged. But the Bureau makes no effort to assemble these facts, first, because there are not enough companies keeping records of them to establish satisfactory norms, and second, because their collection seems foreign to the main purpose of the Bureau. As stated in the first paragraph of this bulletin the Bureau's object is to furnish reliable and prompt information regarding the amount

of labor turnover a Michigan firm should expect to have. Provided with such information it is the particular company's own business to determine why its turnover differs from the average and whether the difference is sufficient to require managerial action. Most of the supplementary information not reported to the Bureau is of the type needed to analyze the reasons for particular company divergence from the average condition.

It must be fully recognized that in the interpretation of the figures presented in this bulletin certain reservations are necessary. The average labor turnover rates given here can only be approximations to the true rates because they are derived from a sample of Michigan firms rather than from all firms. No sample can give a perfect picture of the facts although, if the sample is large enough and selected without bias, a close approximation to the truth can be obtained.

Since the figures used here are not beyond criticism in these respects a word of comment is inserted. There may be a form of bias in the data because the contributing firms are probably among the best managed in the state. Their willingness to contribute facts for study is in itself evidence that they are aware of the problem of labor turnover and probably that they are seeking an intelligent solution of it. It is altogether likely that their turnover rates are as a rule lower than those of companies not so interested. Many companies do not keep adequate records of personnel: they are probably among the less ably managed firms and have a waste of labor much higher than they suspect. Therefore, the exclusion of the less ably managed firms from the Bureau's list may well have the result of giving a downward bias to the averages used here.

It is possible, however, to regard a downward bias of this sort as a desirable characteristic of the figures because the Bureau's object is to determine the amount of labor turnover to be expected of an efficiently operated firm in the state.

Aside from the matter of bias caused by the method of selecting data, a serious question arises regarding the size of the sample itself.[7]

[7]There may be another source of bias, quite different in nature, arising from the inclusion of reports from many small concerns. One third of the companies reporting employ some ninety percent of the workers represented. The problems created by this fact are very complex and are considered in a later section.

If strict regard is paid to the rules of probability some of the averages are based on too small a sample to be reliable. This is probably not true of the averages for the state of Michigan taken as a whole, but there are some districts and industries, as shown by Table 1, represented by fewer than a half dozen companies. Obviously an average of so few cases is subject to chance variations. Nevertheless, averages were computed for all cases when two or more companies are presented because it seemed that even a rough approximation to the true rates of turnover was better than no information at all.

REGIONAL LABOR TURNOVER RATES

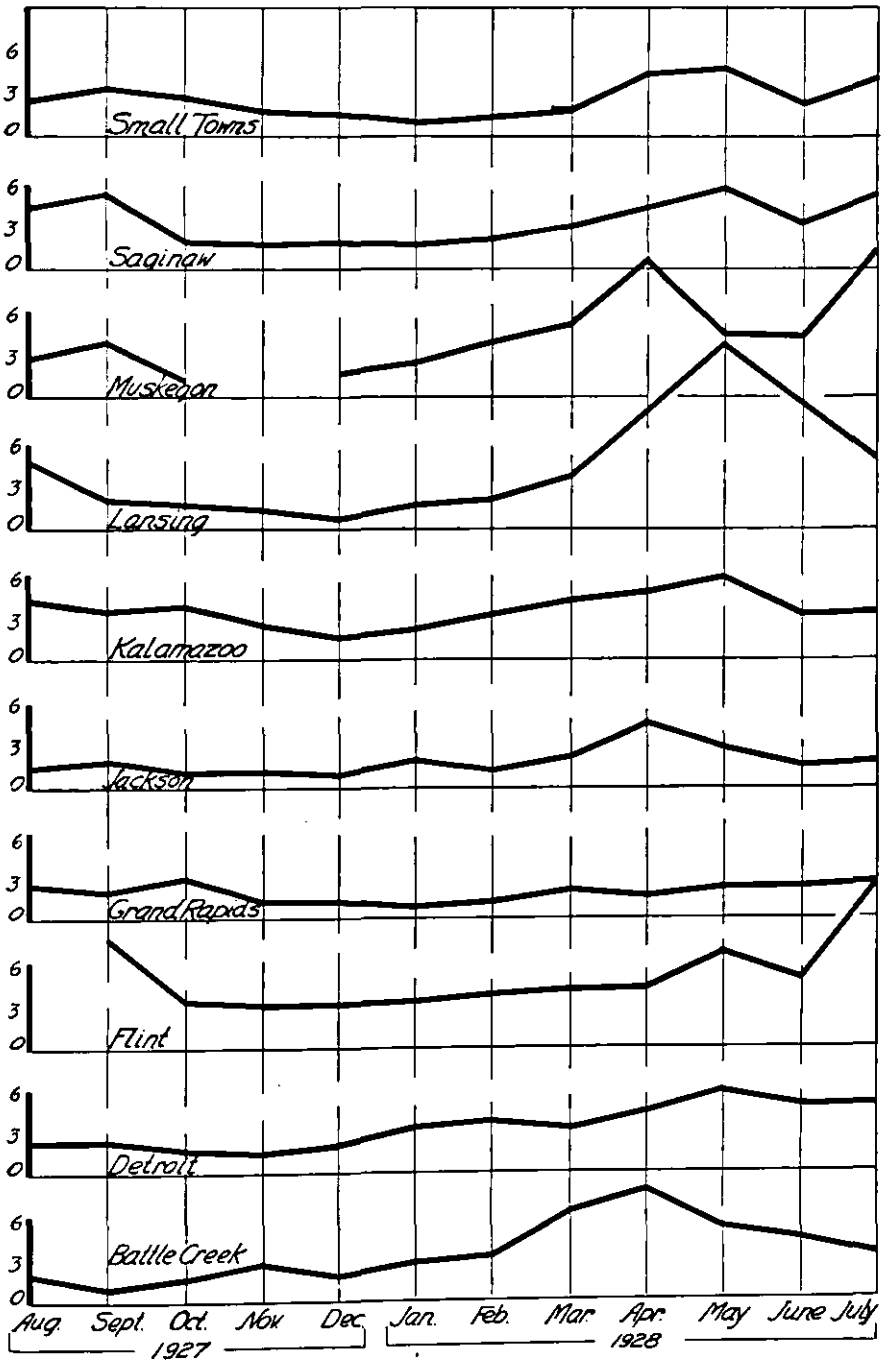
With the accumulation of labor turnover data in the Bureau files, it has become increasingly evident that there exist regional differences in the labor market such that firms located in the various cities of Michigan are compelled to meet different labor situations. Some of the differences may be observed by an examination of regional quit rates. Chart 1 shows the voluntary quit rates for ten Michigan cities by months from August 1927 through July 1928. The quit rates only are shown in this chart but significant differences appear in the other rates as well.[8]

The voluntary quit rates in all Michigan cities reached their low point somewhere about the turn of the year, at a time coincident with the last period of dull trade. From January on through the spring months practically every district showed an increase in the loss of workers through voluntary quits, a fact accounted for, no doubt, by the expansion of business during that period. This tendency for quits to fluctuate with business conditions is generally recognized. Workers are least likely to separate from employment when work is difficult to obtain and most likely to leave when jobs are plentiful.

Not all cities, however, experienced this undesirable feature of prosperous times with equal force. Grand Rapids, at the one extreme, showed a slow but steady increase in the quit rate; Lansing, at the other, showed a fluctuating rate with a sharp peak during April and

[8]Complete figures appear in the Appendix.

CHART 1—AVERAGE MONTHLY QUIT RATES IN MICHIGAN CITIES
(Quits expressed as percentages of average on payroll)



May. Between these two there were a variety of changes having little in common except the upward tendency of the spring months.

Explanation of the cause of these differences offers a fertile field for speculation but their importance for the present discussion is less in their cause than in the mere fact of their presence. Employment departments cannot be held responsible for all the circumstances which result in high regional turnover rates; they can be held responsible for company rates that are out of line. There is less reason for complacency on the part of a Grand Rapids firm which has shown a steady volume of quits during the past year than for a company with steady rates in some other section which has undergone more unusual labor difficulties. Every efficiently operated concern must constantly check the work of its employment department. This is usually done by comparing the experience of one date with that of an earlier period, giving scant regard to the existence of outside forces. The evidence presented here tends to show that such comparisons neglect a very important set of considerations, namely, the existence of regional peculiarities in the labor market.

High labor turnover rates in a local market are not always evidence of an unsatisfactory condition. It will be observed in Table 3 that the level of turnover rates differs among communities. Whereas Chart 1 showed the monthly fluctuation of quit rates, Table 3 shows the annual averages of all the turnover rates (reduced to monthly form, as all rates are which have been used in this bulletin). The outstanding facts noted in the chart were the monthly variations. From this table it may be seen that the levels, about which monthly fluctuations take place, vary from one city to another, the highest being found in Detroit and Muskegon and the lowest in Grand Rapids.

It should be emphasized again that the existence of high labor turnover levels is not in itself evidence of unsatisfactory conditions. There may be thoroughly good reasons for such high rates. It is a mistake to suppose that the reduction of labor turnover is under all circumstances a net advantage. There are industries which thrive best in a mobile labor market because their business is by nature seasonal or subject to unexpected changes in volume. These industries tend to locate in large cities or to build up around them communities where

TABLE 3—ANNUAL AVERAGE LABOR TURNOVER RATES CLASSIFIED BY DISTRICTS
(Figures expressed on a monthly basis)[1]

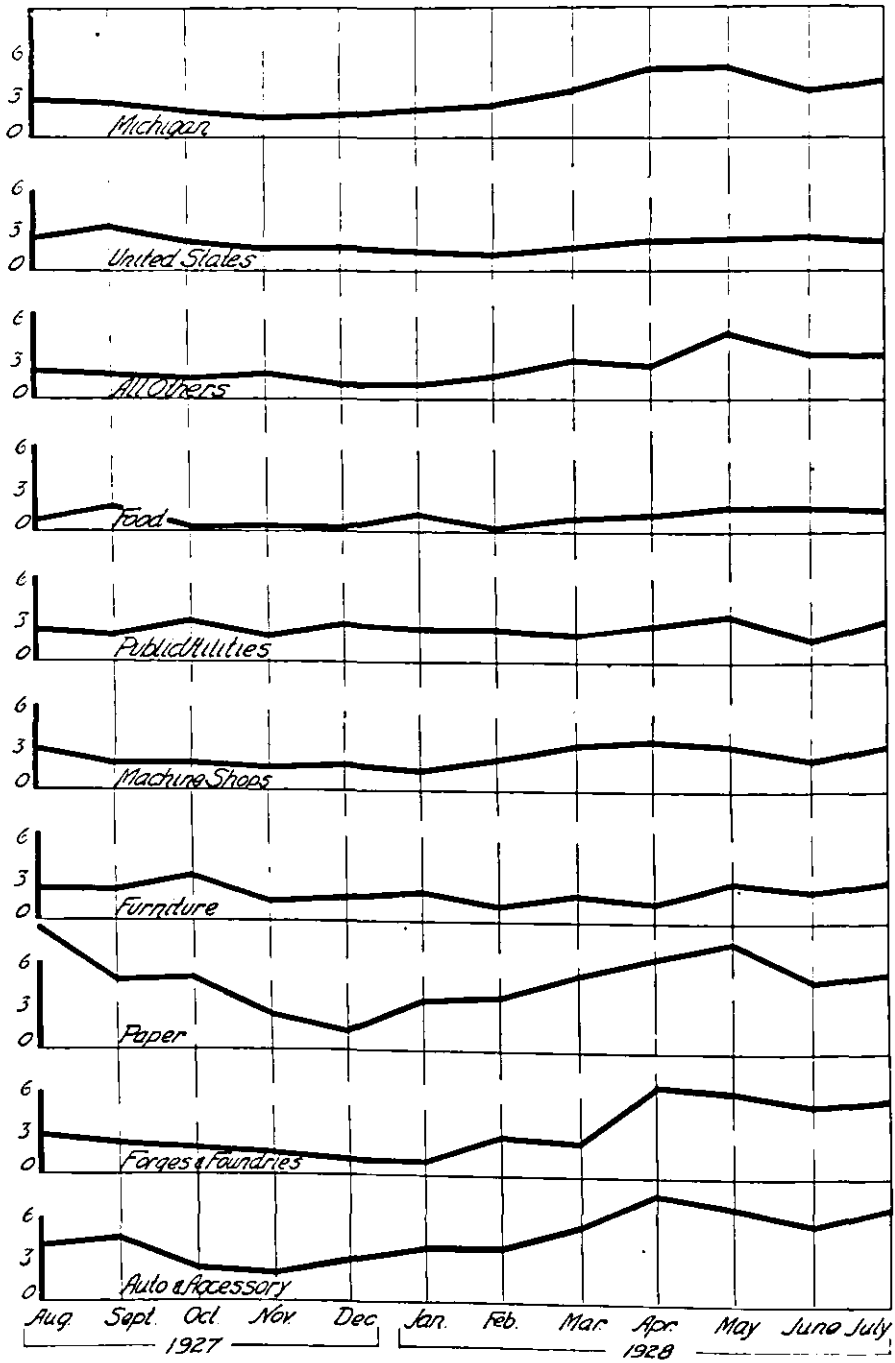
District	Quit Rate	Discharge Rate	Lay-off Rate	Total Separation Rate	Hiring Rate
Battle Creek	4.0	0.8	2.1	6.9	9.0
Detroit	4.0	1.3	4.8	10.1	11.3
Flint	5.8	1.3	2.4	9.5	12.2
Grand Rapids	2.0	1.0	1.7	4.7	4.9
Jackson	2.5	1.7	3.3	7.5	9.6
Kalamazoo	3.6	1.1	1.5	6.2	5.8
Lansing	5.0	1.6	1.7	8.3	9.6
Muskegon	4.3	1.6	5.6	11.5	13.4
Saginaw	3.4	1.0	1.5	5.9	5.0
Small Towns	2.4	0.3	3.0	5.7	5.8
Michigan	3.3	1.0	2.3	6.6	8.0

[1]In this table the regional averages are in every case medians. Individual company rates, on which these medians are based, were computed by dividing the average monthly accessions or separations by the average on payroll and multiplying by one hundred. The company rates are, therefore, on a per-month basis; in a few cases they represent less than twelve monthly reports.

labor moves easily from one employment to another. One may well argue that employees are happier in the environment of stable industries where changes of employment are relatively few, but so long as there are industries which require a mobile labor market there will be districts in which high labor turnover rates are normal. The data that are presented in Table 3 do not, therefore, furnish invidious comparisons between districts. They merely show that regional differences exist and must be reckoned with in employment practice.

Labor turnover rates given in Table 3 should not be confused with general turnover rates which would be based on all kinds of employment. Only factory labor is included in these figures. Whether regional differences exist in the turnover of department store help or bank help or in other kinds of employment is a question on which the table throws no light.

CHART 2—AVERAGE MONTHLY QUIT RATES IN MICHIGAN INDUSTRIES
(Quits expressed as percentages of average on payroll)



INDUSTRIAL LABOR TURNOVER RATES

There are industrial as well as regional differences in labor turnover. Some of these differences may be seen by inspection of Chart 2 which shows the monthly quit rates in Michigan's most important industries. The quit rates are chosen for reproduction in this chart so that comparison may be made with the regional rates presented in Chart 1. Other industrial turnover rates, if reproduced here, would also show significant relations.[9]

Examination of Chart 2 discloses important facts. In the first place, it is clear that differences exist between the quit rates of these industries quite as striking as the differences between regional rates disclosed by Chart 1. From one month to another some industries may show an increasing rate while other industries show the reverse. In the second place, the spring and early summer increase of the quit rates which took place in every region, is found to have occurred in most industries but not in all.

These points may be disposed of without difficulty. Quit rates vary among industries because quit rates depend upon business prosperity and because prosperity does not touch every industry at the same time or in the same degree. There exist seasonal periods of activity in many Michigan industries and there probably exists a tendency toward independent cyclical movements in many industries. The combination of these forces often leads to greater prosperity in one industrial group than in another. One industry may be in need of workers when another is unable to give employment to its usual force. In consequence the turnover rate may move toward higher levels in the first industry than in the second. It is not unexpected, therefore, to find monthly variations in the quit rates, as shown in Chart 2, or to find that the industries whose quit rates have advanced most during 1928, are the automobile and allied groups.

Not only are there month to month differences in industrial turnover rates, but there are differences in the levels of the rates. Table 4 shows the annual average turnover rates (on a monthly basis) in Michigan's most important industries.

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[9]Complete data are found in the Appendix.

TABLE 4—ANNUAL AVERAGE LABOR TURNOVER RATES CLASSIFIED BY INDUSTRIES
(Figures are given on a per month basis)

Industry	Quit Rate	Discharge Rate	Lay-off Rate	Total Separation Rate	Hiring Rate
Auto and Accessories	5.2	1.6	3.3	10.1	14.1
Forges and Foundries	4.0	1.0	5.8	10.8	12.8
Paper	5.1	1.6	1.2	7.9	9.4
Furniture	2.0	0.7	2.4	5.1	5.3
Machine Shops	2.6	1.0	1.2	4.8	5.5
Public Utilities	1.7	0.8	0.7	3.2	5.7
Food	1.0	0.1	2.9	4.0	6.2
All Others	1.8	1.0	2.2	5.0	5.9

THE INTERPRETATION OF TURNOVER RATES

In the preceding sections evidence was presented to show, first, that differences exist in the labor turnover rates of various cities and industries in Michigan and, second, that figures are obtainable to show approximately what these differences are. It remains to indicate how individual companies in the state may make use of these facts to advantage in the administration of their personnel departments. This is the task undertaken in the following pages. Methods of reducing labor turnover are not dealt with *per se*, nor is it assumed that low rates are desirable and high rates always to be avoided. The emphasis here is solely upon the analysis of a labor situation to the end that management may know whether it is experiencing unusual difficulty in maintaining its working force.

In order to analyze the record of its labor separations and accessions the individual company requires an answer to the following questions. First, what turnover rates are the most significant measures of the efficiency of the employment department? Second, with what standards of performance should these rates be compared? Third, how far may the company rates deviate from the standards before a serious condition of affairs is indicated? When individual company rates are examined in the light of these questions, it is probable that a correct appraisal of the turnover situation can be reached.

It is possible to make a direct answer to the first question. The

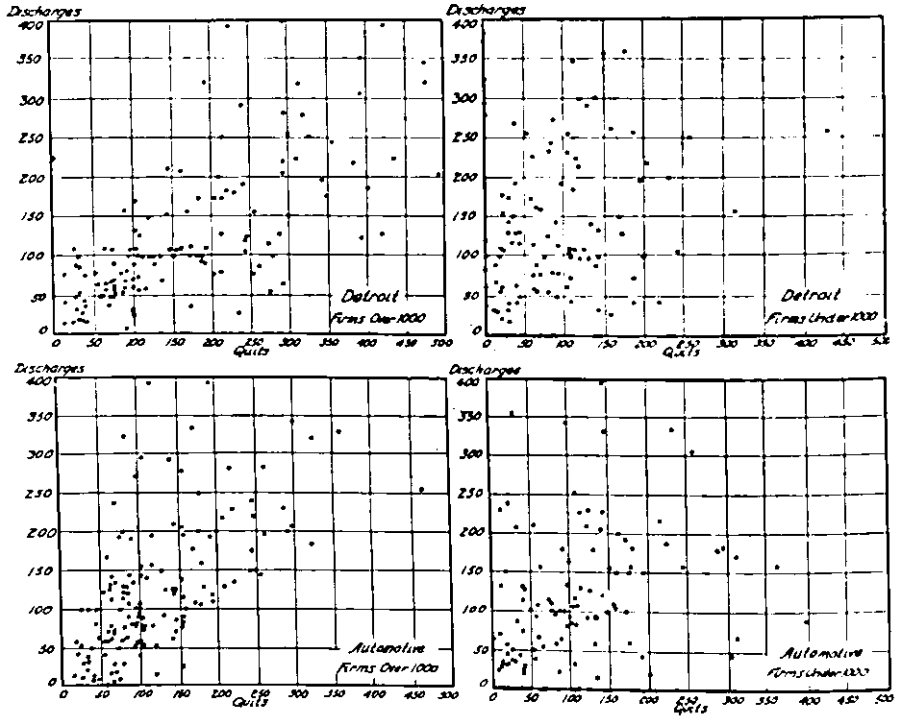
voluntary quit rate and the discharge rate are the turnover figures most significant as measures of the effectiveness of an employment department. If working conditions or rates of pay in one plant are out of line with those of other plants which compete for labor, the voluntary quits will record the flow of workers from the less to the more desirable situations. The company that is out of line will have abnormal quit rates. Also, if the selection of employees in any plant is faulty so that persons are hired who are unable to do the required work or are unable to fit into the company organization, discharge rates will be affected. Since both the selection of employees and the supervision of general working conditions are personnel functions, there should be this direct tie-up between the effectiveness of personnel work and the quit or discharge rates.

The statements made above should not be misconstrued to mean that an employment office whose records show no quits or discharges has attained the ultimate in personnel administration. In the best organization there will develop misfits, persons who for their own good or the best interests of the company should seek employment elsewhere. There may often be an advantage in bringing new employees into a plant to provide new enthusiasm or to prevent inbreeding. There may even be good grounds in particular cases for not incurring the expense of high grade personnel work to reduce labor losses. These, and perhaps other facts, should be borne in mind when analyzing a particular situation but the main argument remains unaltered. The quit rate and the discharge rate normally reflect the efficiency of a personnel department.

Lay-off rates should be regarded in a quite different light. It is ordinarily beyond the power of the employment department to influence them; they are chargeable, usually, to the general policy of the company or to the inefficiency of some operating department which causes a stoppage of work. Lay-offs may, indeed, influence temporarily the work of an employment department, since prospective lay-off sometimes induces persons to quit more readily than they would otherwise do. Generally, however, the lay-off rate may be treated as a measure of those labor losses which do not reflect discredit on the personnel department.

Some further observations may be made regarding the quit rate and discharge rate which have an important bearing upon the practical interpretation of these rates. The following observations are drawn chiefly from Charts 3 and 4, which are described in the footnote below;[10] briefly, the conclusions are as follows. *First,* a company

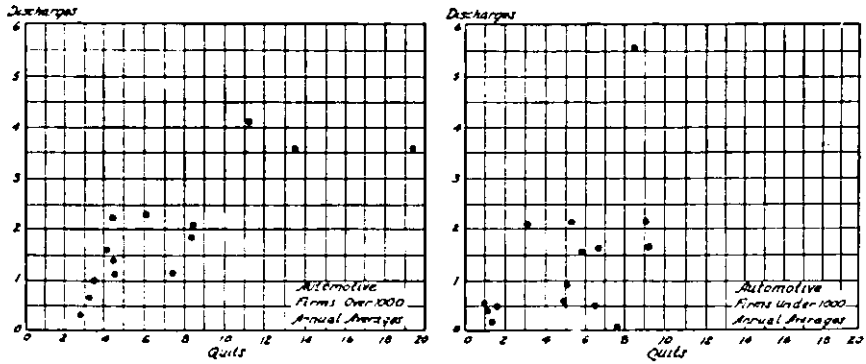
CHART 3—SCATTER DIAGRAM SHOWING THE RELATIONSHIP BETWEEN MONTHLY QUIT RATES AND DISCHARGE RATES
(Median rates equal 100)



[10]In Chart 3 the individual monthly quit rates are expressed as percentages of the appropriate monthly average quit rates; the discharge rates are likewise expressed as percentages of the monthly averages. In this way the rates for all months are rendered comparable despite the fact that the crude rates for one month are on a different level from the crude rates for another month. The charts show that discharge rates are positively associated with quit rates and that the degree of association is greater for large firms than for small ones. The degree of association is shown by the scatter of the plotted points.

In Chart 4 the annual averages of quit rates and discharge rates are compared. The scales used in this chart are the crude rates (reduced to monthly form). Chart 4 confirms the evidence of Chart 3 that discharge rates and quit rates are associated and shows also that the degree of association is greater for annual averages than for the averages of shorter periods.

CHART 4—SCATTER DIAGRAM SHOWING THE RELATIONSHIP BETWEEN ANNUAL QUIT RATES AND DISCHARGE RATES
(Rates expressed on a monthly basis)



with quit rates below average usually has discharge rates below average (average is represented in Chart 3 by 100) and a company with quit rates above average tends to have the discharge rate above average also. Thus the quit rate and discharge rate usually present consistent evidence of efficiency or of inefficiency. *Second,* the reliability of the evidence presented by these rates varies with the length of period covered and with the size of company. Evidence based on a quarterly or semi-annual study of labor turnover is more reliable than evidence based on a shorter period. Small companies particularly should be cautious about accepting conclusions based on a single month's comparisons because the small number of persons concerned and the short period of time covered enhance the risk that chance variations have an important effect on the rates. *Third,* the need for an annual or semi-annual summary of labor turnover rates does not imply that monthly study of these rates is unnecessary. Despite the fact that chance irregularities may disturb monthly figures, these figures are useful in disclosing trends which otherwise might be disguised until too late for effective managerial attention.

It is easier to discover which turnover rates are the most significant measures of personnel performance than to tell with what standards these rates should be compared. It is obviously unprofitable for a company to rely solely upon the comparison of its present rates with its past rates. Such a comparison may show improvement in performance but its own past rates may have been indicative of a very

unsatisfactory situation so that the improvement is still not enough to make its own performance creditable when compared with that of other companies. In some manner the company rates should be compared with standards that are based on the experience of other companies in a comparable situation.

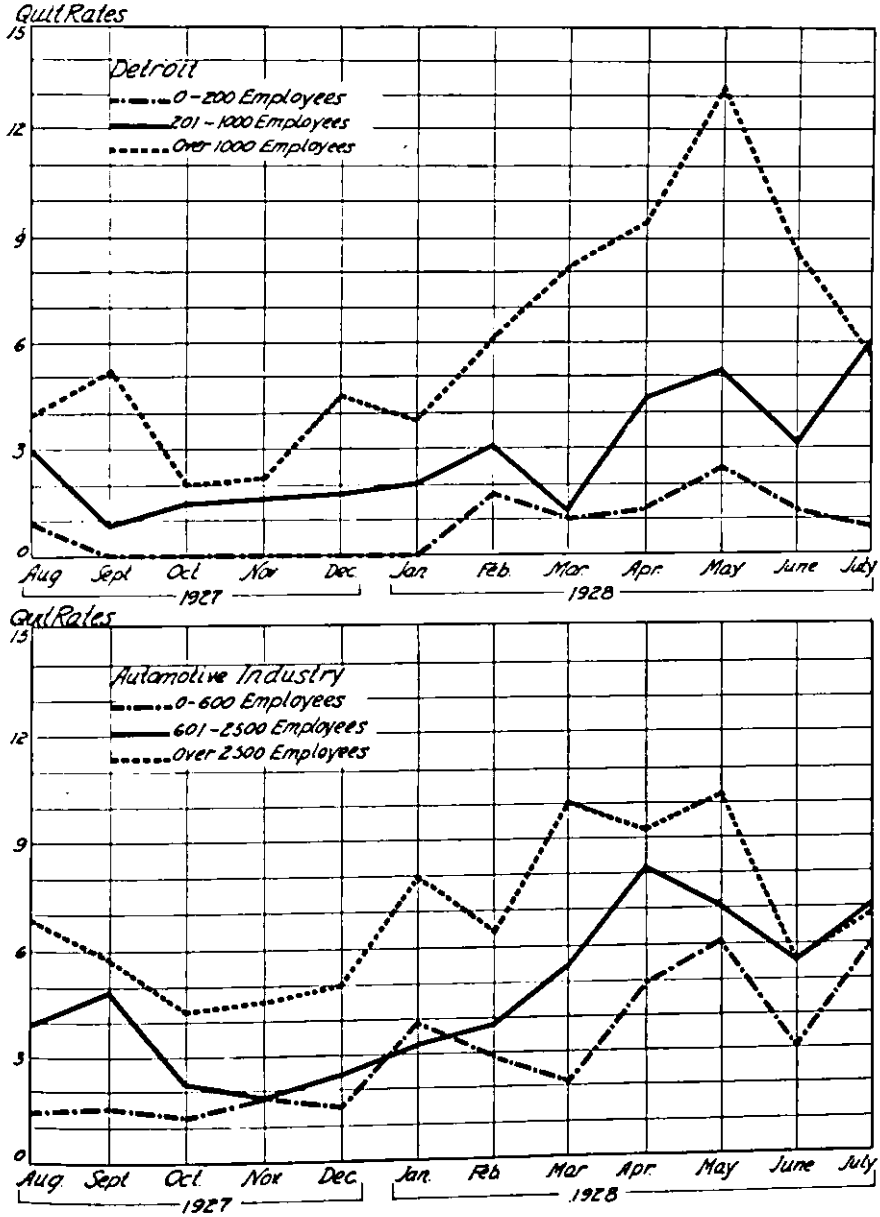
There may well be doubt, however, regarding the choice of companies which are truly comparable. It is in recognition of this reasonable doubt that the standards developed by the Bureau of Business Research and printed in the last pages of this bulletin are presented in two forms. There are averages given here by districts and averages given by industries. The district averages are based on the turnover rates of all companies in a particular region, irrespective of the industry in which they fall; the industry averages are based on the experience of all firms in an industry irrespective of the district in which they are included. It remains to consider which averages are most significant for an individual company to examine.

Unfortunately no simple answer can be given; that is, no evidence is available to show that one group of averages is more significant than the other in every case and should, therefore, be used exclusively. It is probable that information of value can be obtained from both the regional rates and the industrial rates. There are undoubtedly some laborers, chiefly of the skilled variety, who move usually from one company to another in the same industry. Voluntary quits for this type of labor may be influenced by ease of obtaining employment in a specific industry. There is also a type of labor which will move from one industry to another. Voluntary quits for this class may be influenced by ease of obtaining employment anywhere in the district involved. The majority of companies employ labor of both types so that comparison of company rates with both regional and industrial rates should be employed. In many cases additional light on a particular company's labor situation might be obtained by a study of its own labor turnover among skilled and unskilled workers.

A final question may be raised regarding the selection of proper standards of comparison for turnover rates. Does size of company influence labor turnover in such a way that average rates selected without regard to size of company are deceptive? The evidence re-

garding this matter is inconclusive. Discharge rates do not show material differences between large and small firms. Quit rates however are higher in the large firms than in the small ones. Chart 5 shows

CHART 5—AVERAGE MONTHLY QUIT RATES, CLASSIFIED BY SIZE OF FIRM



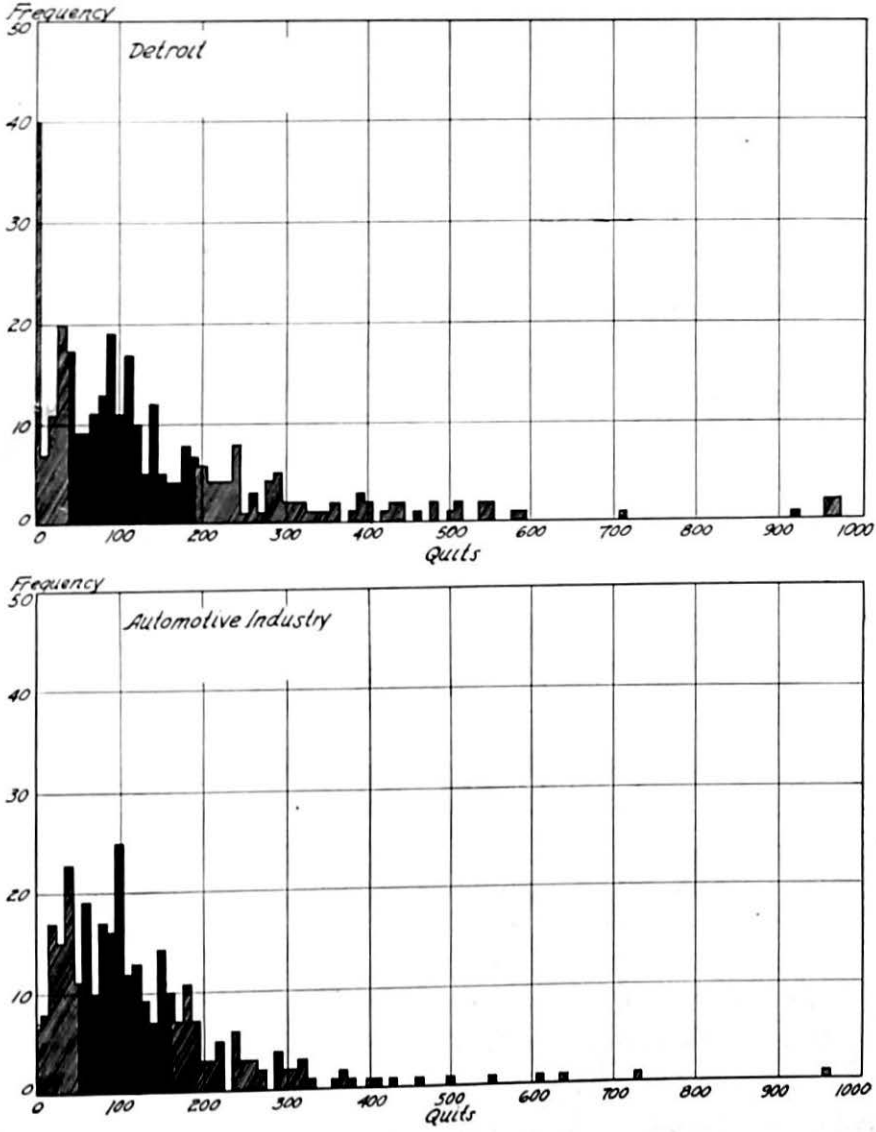
the monthly averages of quit rates in Detroit and in the automotive industry classified by size of firm. In Detroit there is a progressive increase in the quit rate from small firms under 200 employees to the large firms over 1000 employees. The differences in rate should not be taken at their face value, however, because the large firms are for the most part in the automotive industry which normally has quit rates higher than other industries of Detroit. A similar classification is made for the automotive industry itself and analogous differences are found. Even here, however, the differences may not be primarily the result of size of firm. Companies with over 2500 employees are either body plants or assembly plants. Companies in the smallest group are usually accessory companies. Therefore the differences which appear in the chart may be true industrial differences rather than differences arising from size of firm. No conclusive answer can be given regarding the effect of size of firm until a far larger sample of companies can be obtained. At the present time it is desirable simply to point out that in any particular instance the possible effect of size of company should be borne in mind.[11]

How far may an individual company's rates deviate from standard before a presumption is created that unusual labor conditions exist within the company? An approximate answer to this question can be obtained from examination of the frequency distribution shown in Chart 6. In this distribution average quit rates are represented by

[11]In connection with the influence of size of firm a question has been raised by some cooperators regarding the method of averaging used by the Bureau. It has been pointed out that an arithmetic mean of the turnover rates, weighted by size of firm would give standard rates greatly in excess of those used. This suggested method of computing standards has merit in that it would show the total turnover of factory labor in Michigan. The standards would not, however, show typical rates in the sense the Bureau desires. Median rates treat each company as of equal importance because it is desired to show how the administration of one company compares with that of another company. From this point of view size of company is not a primary factor and the suggested method would give undue weight to large companies.

Added to this consideration is the undesirable effect of chance or erratic variations on the arithmetic mean. An unusually large erratic fluctuation in the rates of a big company would produce a large effect on the arithmetic mean but no appreciable effect on the median.

CHART 6—FREQUENCY DISTRIBUTION OF MONTHLY QUIT RATES
(Median rates equal 100)



100 and all company rates are expressed as percentages of the averages. The solid area in the center of the distribution includes one-half of the companies; the lighter areas include the lower quarter and the upper quarter. Approximately one-half of the companies have rates falling between 50 percent of average and 180 percent of average. The figures chosen are known as the quartiles and the interval between them as the quartile range. Company rates falling in the quartile range do not show an extreme deviation from the typical rates. The criterion selected here may seem unduly conservative and many companies may prefer to consider a much smaller deviation from the typical figures significant of unusual conditions. Other criteria may be selected readily by examination of the distributions shown.

In order to illustrate the application of the principles discussed above an example is given here of the interpretation of a particular company's labor turnover rates. The company is selected at random from the cooperators reporting to the Bureau.

The August and September report on a particular company as computed by the Bureau is given in the table opposite. In the last two columns of this table are given the Michigan and United States labor turnover rates which are, of course, identical with those received by all cooperators. The first column shows this company's own turnover rates. The second shows the average rates for the city in which this company is located and is an average of the figures from firms in several industries. The third column shows the average rates for the industry to which this company belongs and includes figures from firms in many parts of the state. From the table comparisons can be made of this company's rates with the rates prevailing in its own district, in its particular industry, in Michigan, and in the United States as a whole. Similar comparisons may be made by any cooperator from the reports received by him each month.

Several points should be borne in mind when interpreting the figures given in this example. These points are general in nature and apply to any company's report. They are as follows:

1. The most significant conclusions will be drawn from examination of the quit rates and the discharge rates.

TABLE 5—REPORTS RECEIVED BY ONE COOPERATOR

AUGUST	Company Rate	District Rate	Industry Rate	Michigan Rate	United States Rate
Voluntary Quits	6.4	4.8	2.7	2.7	2.3
Discharges	0.3	1.0	1.1	0.7	0.4
Lay-offs	6.4	3.6	3.3	1.6	0.7
Total Separations	13.1	9.4	7.1	5.0	3.4
Accessions	5.0	6.2	5.5	6.0	3.5
SEPTEMBER					
Voluntary Quits	1.1	2.1	2.1	2.6	3.1
Discharges	1.8	1.3	0.4	0.8	0.6
Lay-offs	0.7	0.7	1.9	1.5	0.5
Total Separations	3.6	4.1	4.4	4.9	4.2
Accessions	2.2	2.2	3.1	5.5	4.3

2. The most significant comparisons to be made of the labor turnover rates of a particular company are with the average rates for the district and industry in which the company operates, rather than with the general state and national averages.
3. One month's figures are influenced by those of the preceding month and should not, therefore, be interpreted alone.
4. Deviations from average figures that fall within the quartile range (i.e. between 50 percent and 180 percent of average) do not indicate very unusual conditions.
5. No criticism should attach to the employment department on account of exceptionally large lay-offs caused by production schedules which the department is obviously powerless to control.

Confining attention first to the total separation rates, these should be compared by this company with the average separation rates for its industry and its district. It will be observed that there was a close relationship between the company's figures and these averages. All three were high in August and low in September when compared with Michigan or the United States. Total separations for this company were 13.1 percent in August and fell to 3.6 percent in September,

while parallel, though less severe drops, occurred in the district and industry.

The conclusion the company should derive from these facts is that its high August losses were the result of a condition local to its industry or its district, and the performance of its employment department should be judged in the light of this fact. The high separation rate of this month was, therefore, not so unfavorable as it would seem to be if comparison were made only with the state or national figures.

Turning to the lay-off rate, this company should notice that its August figure of 6.4 is much in excess of that of the district or the industry. This is a fact of importance in itself but no criticism should attach to the employment department on account of it. In order to measure the performance of that department the lay-offs should be subtracted from the total separations of this company, and comparison should be made of the resulting figure with similar figures for the district and the industry. Such a comparison for this company in August would show the following result:

	Company Rate	District Rate	Industry Rate
Voluntary Quits and Discharges	6.7	5.8	3.8

The resulting comparison is more favorable to the employment department than a comparison of total separation rates.

It is probable, however, that the comparison still does some injustice to this department. Appended to the August report of this company was a note to the effect that over half the voluntary quits in that month were due to persons leaving the city in search of better jobs. It is probable that many of these decided to give up their work because of the prospect of early lay-off. Thus the high voluntary separation rate as well as the high lay-off rate may have been caused by the slowing down of production, a change which the employment manager could not control and for which, therefore, he should not be held responsible. If allowance is made for this fact it becomes probable that the performance of this company, in regard to the turnover of its labor force, compares favorably with other firms in its district and in its industry. This conclusion is strengthened by the fact that

the quit rate does not deviate from the average more than the quartile range.

The favorable interpretation of this company's labor turnover rates in August is confirmed by its September experience, when the separation rates are as a whole smaller than the composite averages against which they should be compared. The company should feel assurance of the correctness of the August analysis when it observes that the sharp drop in its lay-off in September is accompanied by a similar decrease in the voluntary quits, indicating that the stimulus of prospective lay-off is not at work to separate men from their jobs.

AN INDEX OF EMPLOYMENT

An incidental result of the Bureau's study of labor turnover has been the assembling of data which may be used to construct an index of factory employment in Michigan. This index is shown in Table 3 of the Appendix. The earlier data used in this index are from unpublished records of the National Industrial Conference Board. Their data show the number of persons employed monthly by identical establishments in four Michigan industries from June 1920 to July 1927. Beginning August 1927 the numbers employed in firms reporting to the Bureau are substituted for the earlier series in such a way as to provide a continuous index. Thus an index is available for each of the four industries. The individual industry series are then combined into a weighted index for the state, using as weights the numbers employed in the 1919 census.

It is recognized that revision of this index will be necessary from time to time as the numbers employed in the various industries change. The Bureau of Business Research expects to continue the construction and revision of the index of employment in Michigan and will supply the figures to interested parties.

APPENDIX

TABLE 1—MEDIAN LABOR TURNOVER RATES, AUGUST 1927—JULY 1928, CLASSIFIED BY REGIONS

(Rate expressed as monthly percentage of average on payroll)

		Quit Rate	Discharge Rate	Lay-off Rate	Total Separation Rate	Hiring Rate
United States						
August	1927	2.3	0.4	0.7	3.4	3.5
September		3.1	0.6	0.5	4.2	4.3
October		2.2	0.4	0.7	3.3	3.3
November		1.5	0.3	0.7	2.5	2.8
December		1.3	0.3	0.7	2.3	2.1
January	1928	1.4	0.3	0.7	2.4	3.2
February		1.1	0.3	0.7	2.1	2.4
March		1.6	0.4	0.6	2.6	2.9
April		2.1	0.4	0.7	3.2	3.1
May		2.2	0.4	0.7	3.3	3.7
June		2.2	0.4	0.6	3.2	3.0
July		2.0	0.4	0.5	2.9	3.5
Michigan						
August	1927	2.7	0.7	1.6	5.0	6.0
September		2.6	0.8	1.5	4.9	5.5
October		2.0	1.0	1.5	4.5	4.2
November		1.5	0.4	1.4	3.3	3.2
December		1.5	0.4	1.3	3.2	2.8
January	1928	1.9	0.8	1.2	3.9	5.3
February		2.2	0.7	1.1	4.0	6.2
March		3.1	0.7	0.6	4.4	6.6
April		4.6	1.2	0.8	6.6	6.9
May		4.9	1.0	1.2	7.1	8.7
June		3.2	1.0	0.4	4.6	6.8
July		3.8	0.8	0.8	5.4	7.3
Battle Creek						
August	1927	1.8	0.1	5.8	7.7	3.3
September		1.0	0.4	5.2	6.6	6.6
October		1.6	0.4	1.4	3.4	3.1
November		2.6	—0—	2.0	4.6	3.6
December		1.8	0.2	4.8	6.8	2.8

TABLE 1—(Continued)

		Quit Rate	Discharge Rate	Lay-off Rate	Total Separation Rate	Hiring Rate
January	1928	2.6	1.3	0.6	4.5	5.5
February		3.0	1.6	0.7	5.3	13.2
March		6.3	1.2	0.6	8.1	15.5
April		7.9	0.7	0.9	9.5	13.1
May		5.2	0.6	0.9	6.7	12.3
June		4.4	0.8	0.5	5.7	7.8
July		3.2	1.0	0.9	5.1	8.9
Detroit						
August	1927	2.4	1.0	4.5	7.9	6.3
September		2.4	0.8	3.0	6.2	6.0
October		1.7	1.1	5.8	8.6	4.8
November		1.5	0.6	2.8	4.9	3.5
December		2.0	0.7	1.3	4.0	8.7
January	1928	3.2	1.1	2.2	6.5	16.2
February		3.7	1.2	2.0	6.9	10.6
March		3.1	1.8	0.5	5.4	11.8
April		4.3	1.6	0.6	6.5	7.4
May		5.8	1.2	0.6	7.6	11.7
June		4.8	1.0	1.8	7.6	7.0
July		4.8	1.0	1.7	7.5	10.9
Flint						
August	1927	—	—	—	—	—
September		7.7	1.4	5.0	14.1	7.0
October		3.5	0.8	10.2	14.5	2.6
November		2.9	0.5	1.9	5.3	3.7
December		3.1	0.8	0.5	4.4	21.2
January	1928	3.3	1.0	1.0	5.3	27.1
February		3.8	1.6	2.6	8.0	8.2
March		4.0	0.7	0.7	5.4	6.6
April		4.1	0.8	2.0	6.9	5.5
May		6.9	0.6	0.7	8.2	6.8
June		5.0	1.0	0.7	6.7	11.0
July		11.7	2.1	—0—	13.8	13.4
Grand Rapids						
August	1927	2.4	0.6	—0—	3.0	6.2
September		1.7	1.0	0.3	3.0	5.1
October		2.7	1.5	1.1	5.3	8.8
November		1.2	0.7	2.7	4.6	2.4

TABLE 1—(Continued)

		Quit Rate	Discharge Rate	Lay-off Rate	Total Separation Rate	Hiring Rate
December		1.2	0.6	2.3	4.1	2.2
January	1928	0.9	0.7	1.5	3.1	6.5
February		1.1	1.3	2.1	4.5	2.5
March		2.0	0.3	1.5	3.8	3.9
April		1.5	1.2	0.6	3.3	2.4
May		2.1	0.2	2.6	4.9	1.1
June		2.4	0.4	—o—	2.8	1.9
July		2.5	0.6	0.8	3.9	5.4
Jackson						
August	1927	1.4	0.8	2.8	5.0	6.1
September		1.6	1.4	0.4	3.4	5.0
October		1.1	1.0	0.4	2.5	5.8
November		1.0	—o—	2.2	3.2	3.6
December		0.8	0.2	5.7	6.7	1.4
January	1928	1.7	1.2	0.9	3.8	13.1
February		1.1	0.4	1.4	2.9	4.7
March		2.1	0.4	0.7	3.2	8.3
April		4.6	1.7	0.5	6.8	10.0
May		2.6	1.9	2.0	6.5	5.4
June		1.6	1.8	0.4	3.8	2.3
July		1.9	1.1	0.7	3.0	2.8
Kalamazoo						
August	1927	4.0	1.5	0.6	6.0	4.6
September		3.4	0.7	2.2	6.3	4.0
October		3.6	1.5	0.1	5.2	4.5
November		2.2	0.6	—o—	2.8	4.4
December		1.4	0.7	0.4	2.5	3.2
January	1928	2.0	0.8	0.3	3.1	3.4
February		3.4	1.4	0.5	5.3	6.1
March		4.2	1.3	0.3	5.8	6.4
April		4.6	1.4	0.5	6.5	4.6
May		5.6	0.8	1.3	7.7	7.1
June		3.1	1.8	0.6	5.5	8.1
July		3.1	1.0	—o—	4.1	7.7
Lansing						
August	1927	4.8	1.0	3.6	9.4	6.2
September		2.1	1.3	0.7	4.1	2.2
October		1.7	0.4	1.5	3.6	2.5
November		1.4	0.8	3.4	5.6	1.8

TABLE 1—(Continued)

		Quit Rate	Discharge Rate	Lay-off Rate	Total Separation Rate	Hiring Rate
December		0.9	0.4	1.2	2.5	2.1
January	1928	1.8	0.9	0.7	3.4	8.4
February		2.1	1.2	0.8	4.1	11.0
March		3.7	1.2	0.3	5.2	18.6
April		8.4	1.8	0.3	10.5	15.6
May		13.0	1.9	1.0	15.9	13.9
June		8.9	2.5	—o—	11.4	13.0
July		5.2	0.9	2.0	8.1	4.0
Muskegon						
August	1927	2.8	2.0	0.4	5.2	18.7
September		3.8	2.6	0.6	7.0	17.0
October		1.1	1.4	7.4	9.9	6.8
November		—	—	—	—	—
December		1.6	0.9	7.5	10.0	4.7
January	1928	2.4	0.6	3.4	6.4	8.1
February		4.0	0.5	1.9	6.4	10.1
March		5.3	2.4	1.9	9.6	13.0
April		9.9	0.9	8.3	19.1	15.0
May		4.3	3.3	0.7	8.3	27.4
June		4.4	1.9	—o—	6.3	14.8
July		10.3	3.4	0.9	14.6	18.1
Saginaw						
August	1927	4.3	1.2	0.3	5.8	6.7
September		5.3	1.4	2.5	9.2	6.4
October		2.0	1.5	0.7	4.2	3.2
November		1.6	0.4	0.8	2.8	2.4
December		1.9	0.4	—o—	2.3	4.0
January	1928	1.7	1.1	0.5	3.3	3.5
February		2.1	0.8	1.3	4.2	2.0
March		3.0	0.6	0.8	4.4	2.3
April		4.2	1.1	2.2	7.5	7.2
May		5.7	0.9	0.2	6.8	8.9
June		3.4	0.4	0.6	4.4	4.9
July		5.2	0.3	1.3	6.8	9.2
Small Towns						
August	1927	2.2	—o—	—o—	2.2	3.3
September		3.4	0.3	—o—	3.7	2.7
October		2.7	0.4	2.8	5.9	3.4

TABLE 1—(Continued)

		Quit Rate	Discharge Rate	Lay-off Rate	Total Separation Rate	Hiring Rate
November		1.8	—0—	2.0	3.8	2.3
December		1.5	0.4	1.3	3.2	2.8
January	1928	1.0	0.3	0.5	1.8	2.9
February		1.2	—0—	0.2	3.4	8.3
March		1.8	—0—	0.7	2.5	4.2
April		4.4	—0—	1.2	5.6	5.1
May		4.6	0.5	2.4	7.5	6.4
June		2.3	—0—	0.1	2.4	5.7
July		3.8	0.1	0.3	4.2	6.7

TABLE 2—MEDIAN LABOR TURNOVER RATES, AUGUST 1927—JULY 1928, CLASSIFIED BY INDUSTRIES

(Rate expressed as monthly percentage of average on payroll)

		Quit Rate	Discharge Rate	Lay-off Rate	Total Separation Rate	Hiring Rate
Automobile and Accessory						
August	1927	4.0	1.5	7.1	12.6	8.8
September		4.4	1.0	3.8	9.2	7.4
October		2.2	1.0	5.1	8.3	3.0
November		1.8	0.6	3.1	5.5	4.1
December		3.0	0.8	1.5	5.3	12.8
January	1928	3.8	1.3	1.8	6.9	20.8
February		3.8	1.3	2.3	7.4	17.5
March		5.4	1.6	1.0	8.0	16.5
April		7.9	1.6	1.6	11.1	11.6
May		6.7	1.6	1.2	9.5	14.5
June		5.6	1.0	2.5	9.1	11.9
July		6.8	1.1	2.0	9.9	9.2
Forges and Foundries						
August	1927	2.7	1.1	3.3	7.1	5.5
September		2.1	0.4	1.9	4.4	3.1
October		1.8	0.8	5.5	8.1	3.8
November		1.4	—0—	4.8	6.2	2.5
December		0.9	0.6	2.5	4.0	2.3

TABLE 2—(Continued)

		Quit Rate	Discharge Rate	Lay-off Rate	Total Separation Rate	Hiring Rate
January	1928	0.9	0.7	2.6	4.2	10.2
February		2.8	0.5	1.0	4.3	9.6
March		2.3	1.0	1.4	4.7	11.5
April		6.8	1.5	1.8	10.1	14.5
May		6.0	1.5	1.2	8.7	12.8
June		5.0	1.4	1.7	8.1	14.6
July		5.2	1.1	5.0	11.3	9.1
Paper						
August	1927	8.6	3.5	3.2	15.3	20.0
September		5.0	1.5	0.6	7.1	6.8
October		5.2	1.6	0.1	6.9	10.6
November		2.5	1.7	0.8	5.0	4.4
December		1.4	0.8	0.4	2.6	4.0
January	1928	3.5	0.9	1.3	5.7	2.5
February		3.6	1.1	0.6	5.3	6.3
March		5.2	1.4	0.2	6.8	6.4
April		6.6	1.6	0.5	8.7	8.8
May		7.8	2.1	0.8	10.7	11.5
June		5.0	2.4	0.5	7.9	12.8
July		5.4	1.9	—o—	7.3	10.6
Furniture						
August	1927	2.1	0.4	0.2	2.7	6.5
September		2.2	1.0	0.3	3.5	5.0
October		3.2	1.1	1.2	5.5	6.2
November		1.2	0.3	2.0	3.5	2.4
December		1.3	0.4	3.2	4.9	2.0
January	1928	2.0	0.6	1.4	4.0	4.9
February		1.0	0.5	1.2	2.7	3.2
March		1.9	0.3	1.0	3.2	1.6
April		1.5	0.4	1.3	3.2	3.6
May		2.7	0.4	2.8	5.9	1.3
June		2.2	0.4	—o—	2.6	3.0
July		2.8	0.6	0.7	4.1	6.5
Machine and Tool						
August	1927	2.9	—o—	0.3	3.2	4.3
September		1.9	0.6	2.3	4.8	4.7
October		1.9	1.0	0.5	3.4	4.0

TABLE 2—(Continued)

		Quit Rate	Discharge Rate	Lay-off Rate	Total Separation Rate	Hiring Rate
November		1.5	—o—	0.7	2.2	2.9
December		1.8	0.4	0.3	2.3	2.6
January	1928	1.5	1.0	—o—	2.5	3.6
February		2.1	0.8	0.7	3.6	3.6
March		3.2	0.7	0.5	4.4	5.3
April		3.7	1.3	0.2	5.2	6.8
May		3.4	0.9	1.2	5.5	6.0
June		2.4	1.1	—o—	3.5	2.7
July		3.2	0.8	—o—	4.0	7.2
Public Utilities						
August	1927	2.1	0.7	1.6	4.4	5.6
September		2.0	1.0	0.5	3.5	4.8
October		3.0	0.6	0.8	4.4	4.7
November		1.8	0.9	1.1	3.8	6.0
December		2.8	0.9	4.0	7.7	6.0
January	1928	2.4	0.8	3.5	6.7	4.6
February		1.4	0.5	0.3	2.2	5.7
March		2.0	0.5	1.3	3.8	3.8
April		2.6	1.1	0.8	4.5	4.4
May		3.4	0.9	1.3	5.6	4.8
June		1.6	0.9	0.5	3.0	6.4
July		2.9	1.1	3.1	7.1	8.2
Food Products						
August	1927	0.6	0.2	9.7	10.5	16.2
September		1.6	0.1	4.6	6.3	5.6
October		0.2	—o—	1.0	1.2	0.5
November		0.5	—o—	1.3	1.8	3.8
December		0.3	0.1	6.7	7.1	2.1
January	1928	1.2	0.1	0.4	1.7	2.7
February		0.4	0.6	1.0	2.0	4.9
March		1.0	0.1	1.7	2.8	13.8
April		1.4	0.1	0.3	1.8	7.4
May		1.7	0.1	0.8	2.6	8.1
June		1.7	0.1	2.1	3.9	3.1
July		1.5	0.2	4.2	5.9	3.2
All Others						
August	1927	2.0	—o—	—o—	2.0	5.2
September		1.6	0.7	1.0	3.3	4.1

TABLE 2—(Continued)

		Quit Rate	Discharge Rate	Lay-off Rate	Total Separation Rate	Hiring Rate
October		1.5	1.3	--o—	2.8	3.9
November		1.9	—o—	0.9	2.8	1.7
December		1.1	0.1	0.2	1.4	3.1
January	1928	1.2	0.2	—o—	1.4	5.9
February		1.8	0.4	1.3	3.5	5.1
March		2.9	1.6	—o—	4.5	8.4
April		2.4	0.2	0.4	3.0	4.9
May		4.8	0.5	0.6	5.9	6.6
June		3.2	0.3	—o—	3.5	5.7
July		3.2	0.7	—o—	3.9	8.5

TABLE 3—INDEX OF EMPLOYMENT IN MICHIGAN

Date	Automotive Industry	Foundry and Machine Shop Industry	Furniture Industry	Paper Industry	Combined
1920					
June	100.0	100.0	100.0	100.0	100.0
July	101.3	99.3	99.5	97.7	100.0
August	95.7	99.5	102.2	98.1	98.1
September	59.5	96.1	101.9	99.8	82.3
October	28.5	86.2	102.5	93.7	65.8
November	18.6	77.4	96.7	90.5	57.3
December	18.8	65.5	89.9	87.3	51.9
1921					
January	16.0	46.6	73.2	88.1	41.4
February	19.2	55.0	71.4	77.5	44.7
March	27.6	49.4	73.0	78.1	46.3
April	35.3	51.9	70.0	57.1	48.3
May	39.7	51.0	69.6	73.0	50.9
June	41.8	52.2	73.1	91.3	54.3
July	31.3	50.2	67.5	83.4	47.8
August	32.0	55.4	78.0	84.4	51.7
September	40.6	55.9	87.4	83.8	56.8
October	40.3	62.2	93.3	87.9	60.1
November	40.6	64.4	89.2	90.8	60.6
December	40.6	68.2	87.8	92.6	61.8

TABLE 3—(Continued)

Date	Automotive Industry	Foundry and Machine Shop Industry	Furniture Industry	Paper Industry	Combined
1922					
July	83.2	101.2	94.8	111.4	93.6
August	96.6	106.4	99.7	111.3	101.8
September	87.4	110.3	105.0	120.6	100.9
October	82.2	105.3	110.1	120.6	97.8
November	85.0	110.0	112.0	120.9	101.0
December	87.8	112.0	113.3	108.5	102.0
1923					
January	90.9	109.2	112.8	105.8	102.1
February	90.6	111.7	111.1	108.0	102.7
March	92.9	112.6	112.3	108.7	104.2
April	100.4	112.6	115.5	112.1	108.1
May	99.3	114.6	116.7	115.4	108.7
June	102.3	114.5	120.1	115.1	110.4
July	107.9	111.3	121.7	117.8	111.9
August	96.6	90.8	123.0	120.3	100.4
September	99.3	104.9	115.2	123.6	105.6
October	94.0	100.3	107.7	119.8	100.4
November	92.9	99.3	106.0	124.9	99.8
December	88.2	89.3	104.0	124.9	94.0
1924					
January	80.8	94.9	100.6	131.4	92.9
February	92.3	105.4	100.3	136.0	101.7
March	93.6	102.9	102.3	134.4	101.6
April	76.1	102.9	102.3	138.1	94.6
May	56.3	104.8	101.3	144.5	87.6
June	41.6	94.4	101.2	149.2	78.2
July	38.5	92.7	102.4	143.2	76.1
August	36.9	86.6	103.8	149.8	74.0
September	39.4	87.3	102.1	146.0	74.7
October	47.7	92.6	103.0	152.3	80.7
November	32.8	87.7	104.2	133.8	71.4
December	39.2	96.6	105.6	135.7	77.7
1925					
January	51.7	108.0	112.6	134.7	87.8
February	57.3	102.9	113.0	133.3	88.2
March	72.4	104.5	114.4	135.4	95.3
April	83.4	113.1	121.7	136.7	104.1
May	82.2	106.1	121.7	137.3	101.2
June	57.0	108.4	115.1	145.8	91.4

TABLE 3—(Continued)

Date	Automotive Industry	Foundry and Machine Shop Industry	Furniture Industry	Paper Industry	Combined
July	75.7	106.3	108.9	149.2	97.6
August	73.9	115.1	111.4	147.1	100.3
September	79.2	116.3	115.8	147.1	103.5
October	79.6	112.1	115.4	146.6	102.1
November	78.7	120.9	114.2	146.6	104.7
December	61.8	131.5	113.4	147.1	101.5
1926					
January	86.2	126.8	113.0	145.7	109.7
February	94.4	127.1	110.9	144.7	112.7
March	95.5	121.4	109.5	144.7	110.9
April	99.8	130.6	107.9	144.7	115.6
May	97.8	122.5	104.1	146.6	111.4
June	101.2	120.4	104.4	148.9	112.4
July	98.5	123.6	107.2	147.9	112.7
August	99.0	116.2	113.2	148.4	111.3
September	101.9	127.9	114.7	148.2	117.0
October	105.5	115.7	114.9	148.1	113.9
November	91.7	113.1	116.7	144.2	107.4
December	64.6	93.6	133.5	145.7	92.1
1927					
January	82.7	93.3	128.8	142.6	98.3
February	119.0	93.9	121.4	138.7	112.0
March	128.7	93.9	118.9	138.6	115.5
April	118.7	90.2	124.7	138.7	111.0
May	123.8	90.7	120.0	146.8	113.2
June	133.5	91.1	119.1	146.9	117.2
July	110.2	91.3	120.1	152.9	108.4
August	103.7	91.0	127.4	156.9	107.1
September	101.1	86.0	125.6	159.9	104.1
October	99.7	82.8	122.2	158.4	101.9
November	94.4	82.4	122.1	156.3	99.3
December	98.1	83.7	116.9	155.8	100.5
1928					
January	108.4	87.1	112.7	152.3	105.0
February	119.7	93.1	113.8	151.3	111.8
March	128.0	96.2	113.4	155.3	116.6
April	135.8	100.1	110.4	150.9	120.3
May	138.7	102.3	105.0	150.6	121.4
June	134.8	105.3	104.5	147.6	120.6
July	132.8	102.1	107.8	154.3	119.6