number hired and the number of separations are known for a given period. An effort should be made to bring about standard and uniform practice in the keeping of all labor or work-time records, and payroll records unquestionably should be more uniform and accurate than at present. Probably the most generally feasible plan would be to have the payrolls cleared at least twice a month, preferably, perhaps, on the first and fifteenth of each month. Such payroll figures would, I believe, give an excellent basis from which to calculate labor turnover or replacement percentages, labor fluctuations, and daily attendance. If the payroll were cleared weekly the accuracy of the calculations would, of course, be somewhat greater.

Unless some sound standard as to the factors which shall be used in calculating labor turnover is adopted and applied generally at an early date, there will be created a still greater statistical chaos than already exists. At present not only is there no universally or even generally recognized method of calculating labor turnover, but there is also an "utter lack of any standards in estimating cause, extent and cost of labor turnover."[1]

An efficient employment manager is probably the first and most important step in any effort to bring about stability in the labor force of an industrial plant. The employment manager can perhaps best demonstrate his efficiency by pointing to the reduction of the labor turnover under scientific as compared with the previous and presumably unscientific "hire and fire" method of foremen. To the employment manager, therefore, it is important that his methods of calculating labor turnover shall be uniform and on a basis that can be defended by sound common sense and logic.

Labor turnover should be measured for the principal departments of any given plant as well as for the plant as a whole. Transfers from one department to another would enter into the labor turnover of the departments affected, but such transfers would not count in the labor turnover of the whole plant. In the United States there is a large amount of interstate migration but these migrants are not added to the statistics of immigrants and emigrants for the United States. The analogy illustrates how transfers should be handled. The labor turnover of the departments of any given plant if summed would show too large a labor turnover for the plant as a whole, provided there had been interdepartmental transfers.

Turnover figures are valuable only as they are used and understood by the employment manager and by the plant management as an index to the labor conditions. When the labor turnover figures are reduced to simple percentages which always have definite significance, the management will get light upon many problems, the solution of which is necessary to effect a reduction in turnover. As the necessary remedies are applied the labor turnover percentage furnishes an index of the result of the remedies. A few of the many partial solutions of the big problem of turnover are profit-sharing, bonus payments, group insurance, other insurance provision for employees such as disability allowances, pensions, etc., good restaurant facilities, quick promotions for the most capable, careful fitting of the employee to the job, etc.

Mere expression of labor turnover in percentages will never solve the problem, but a simple mathematical statement of its size is likely to persuade the manager that it is important to seek for the causes why men leave in such large numbers. Next, he is apt to study the cost of turnover and, finally, he will be in a position to justify to himself or to the owner of the business that it is better to spend money for preventative measures than for the wasteful and reckless hiring and firing methods so usual in American business. The mathematical formula of labor turnover will thus be transformed into a better understanding of the human element, with the result that the average length of service of the employees will be considerably extended and the labor turnover correspondingly reduced, to the great and mutual advantage of employer and employees.

ILLUSTRATIONS OF LABOR TURNOVER CALCULATIONS.

For an increasing payroll the following example will illustrate the method when payrolls and changes in same are available in weekly reports. Some months will embrace five weeks and others four. Any given week should be included in that month which embraces four or more of its days. When five weeks are included in a given month the turnover percentage for the month must be multiplied by 10.4 to reduce it to a yearly basis, and when only four weeks are included the factor for multiplication is 13.

INCREASING PAYROLL

Week Ending	Payroll	No. Hired	No. Lost	No. Replaced	Labor Turnover Percentage	
					Weekly	Yearly
Oct. 5, 1918	2,593	37	15	15	.58	30.1
Oct. 12, 1918	2,615	42	17	17	.65	33.8
Oct. 19, 1918	2,640	26	19	19	.72	37.4
Oct. 26, 1918	2,647	17	20	17	.64	33.4
Nov. 2, 1918	2,644	22	18	18	.68	35.4
Total.....	13,139	142	89	89	3.39	35.2
Av. Payroll	2,628					

In this example the fundamental data are assumed to be available, week by week, and the establishment is assumed to be a growing one with weekly additions to the force generally larger than the subtractions from all causes whatever. In this example the weekly percentages of turnover varied only slightly, or from .58 to .72. Multiplying the weekly turnover percentages by 52 reduces them to a yearly basis. For the month ending November 2, the turnover percentage was 3.39. As the period was really five weeks, or 10.4 part of a year, the turnover percentage reduced to a yearly basis is 3.39 multiplied by 10.4, or 35.2.

In the next example the week ending October 26 is purposely shown as indicating a greater loss than gain in the payroll. The replacements for that week represent the number hired rather than the number lost, or 17 rather than 20. For the five weeks as a whole, however, the number hired is in excess of the separations so in the totals the 20 is included as replacements. When large numbers of industrial establishments are being followed week by week, as is done in the Emergency Fleet Corporation, the weekly turnover percentage is a valuable index of the general trend of this phase of the labor problem. It should also serve a useful purpose in any industrial establishment. The payroll, however, should be cleared weekly, if feasible, and at worst not less often than every two weeks if the labor turnover is to be calculated with a close approximation to exactness.

DECREASING PAYROLL

Week Ending	Payroll	No. Hired	No. Lost	No. Replaced	Labor Turnover Percentage	
					Weekly	Yearly
Oct. 5, 1918	6,754	70	95	70	1.04	53.9
Oct. 12, 1918	6,729	47	83	47	.70	36.3
Oct. 19, 1918	6,693	27	78	27	.40	21.0
Oct. 26, 1918	6,642	50	45	45	.68	35.2
Nov. 2, 1918	6,647	39	60	39	.59	30.5
Total.....	33,465	233	361	233	3.48	36.2
Av. Payroll	6,693					

In this example the payroll is fairly continuously diminishing. In such instances the number hired rather than the number of separations represents the turnover for only such losses are replaced as are represented by number hired during the period under observation. During the five-weeks period, in the example, obviously the turnover percentage is represented by 233, the number hired, divided by 6,693 the average payroll, or 3.48. The factor 3.48 multiplied by $\frac{52}{5}$ or 10.4, gives 36.2 as the labor turnover percentage, yearly basis.

During the week ending October 26, 50 men were hired as against 45 lost from the payroll. In the calculation of the weekly turnover percentage for that week, the number of replacements must be considered as 45, therefore, and not 50, although the 50 should be used when calculating the turnover for the five-weeks period.

If labor turnover percentages are to be calculated only on a monthly basis, the payroll should preferably be given for the first and fifteenth of the month so as to get as true an average or mean payroll as possible. If this is not feasible the next best thing is the payroll at the beginning and end of each month from which approximate means can be derived for each month by taking the sum of the two numbers and dividing by two.

The simplest formula for labor turnover and one which will serve every practical purpose is as follows:

$$T = \frac{R}{\frac{P_1+P_2+P_3+-P_n}{N}}$$

In this formula:

T = Turnover
R = Replacements, or number hired to replace losses.
P = Payroll.
N = Number of Payrolls used in striking an average for the period under observation.

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