b. The number newly hired as the base in the case of a decreasing force.

2. It uses the average attendance as the denominator instead of the number actually employed by the company. The best index of the average number actually employed is not the average attendance but the average number on the payroll.[1] The use of the average attendance as the denominator confuses absenteeism with turnover. Recent investigations show that from 6 to 15 per cent of the working force are absent daily. Yet these men fill positions which are part of the working force and consequently should not be disregarded in computing the average working force. Absenteeism should be treated as a separate item in labor loss and not included in the computation of turnover.[2]

The preceding paragraphs indicate the methods which I believe should be followed: To compute the percentage of labor turnover for any period, find the total replacements for the period considered and divide by the average number on the payroll.

The difference between the method proposed by the author and that adopted by the Bureau of Labor Statistics may be seen from the following two non-algebraic examples:

EXAMPLE A

COMPUTATION OF LABOR TURNOVER WITH AN INCREASING LABOR FORCE.

1. Given statistics:
   Number employed at beginning of month 1,000.
   Number employed at end of month 1,100.
   Number newly hired 300.
   Number positions vacated not filled 10.
   Average daily attendance 900.

2. Method of Bureau of Labor Statistics:
   Number of separations=300-(1100-1000)=200.
   $$\text{Labor turnover} = \frac{200}{900} = 22.2 \text{ per cent.}$$

3. Method proposed:
   $$\text{Average force on payroll} = \frac{1000 + 1100}{2} = 1050.^3$$
   Number of replacements=300-(1100-1000)-10=190.
   $$\text{Labor turnover} = \frac{190}{1050} \text{ or } 18.1 \text{ per cent.}$$
   $$\text{Percentage of absenteeism} = \frac{150}{1050} = 14.3 \text{ per cent.}$$

EXAMPLE B

COMPUTATION OF LABOR TURNOVER WITH A DECREASING LABOR FORCE

1. Given statistics:
   Number on payroll at beginning of month 1,000.
   Number on payroll at end of month 900.
   Number newly hired 25.
   Average daily attendance 800.

2. Method of Bureau Labor Statistics:
   Number of separations = 25 + (1000-900) = 125.
   $$\text{Labor turnover} = \frac{125}{800} \text{ or } 15.6 \text{ per cent.}$$

3. Method proposed:
   $$\text{Average number on payroll} = \frac{1000 + 900}{2} = 950.$$
   Number of replacements = 25.
   $$\text{Labor turnover} = \frac{25}{950} \text{ or } 2.6 \text{ per cent.}$$
   $$\text{Percentage of absenteeism} = \frac{950\text{-}800}{950} \text{ or } 15.8 \text{ per cent.}$$

It will be noticed that the use of this method results in a much lower turnover rate which is especially true in the case of a decreasing labor force.

The labor turnover for a given period should be reduced to a yearly basis in the same fashion that the Public Health Service reduces mortality and morbility statistics to a yearly rate. If the given period is a month, the percentage should be multiplied by 12; if a week by 52. Care should be taken: (a) that the replacements listed should not include former employees newly hired for their old positions; (b) that the statistics be compiled for departments and trades as well as for the plant as a whole.

"THE capitalist has a deep-rooted belief in the *fallacy* that the lower the wages and the longer the hours worked by Labour are, the lower the cost of production must be . . . Labour has a deep-rooted belief in the *fallacy* that there is only a certain limited amount of work to be divided amongst an ever-increasing number of workmen, and that, consequently, restriction of output is the most sure and certain way to provide work for all; . . . " (Lord Leverhulme, *The Six-Hour Day*, p. 117—italics ours).

[1]Care should be taken that the payroll does not contain "dead wood", or men who have really left the employ of the company.

[2]Mr. Boris Emmett, an investigator for the United States Bureau of Labor Statistics, in his article on the "Nature and computation of labor turnover," *Journal of Political Economy*, Feb., 1919, pp. 105-117, has come to believe in the use of hirings rather than separations in a decreasing work force, but he still clings to the use of the average attendance as the denominator. One of his objections to the use of the payroll is that it contains absentees. Of course it does, but these can be computed separately and should not be confused with turnover.

[3]That is, the arithmetic average of the number employed at the beginning and end of the month. The number each week can be averaged if more accurate methods are desired.

PRINCIPLES OF STORAGE[1]

BY HENRY WOOD SHELTON[2]

PART I. THE LAYOUT OF STORAGE SPACES

The aim of Part I is to aid in the more economical and effective use of storage space, and to insure the possibility of finding without delay any item known to be on hand.

Good marking of storage spaces, making it possible to tell instantly where a given item of stores is, depends on good layout. The ability to go direct rather than in a round-about way to any item in a good layout depends on good marking. In planning for either marking or layout, their interdependence should be kept in mind.

Some of the storage areas abroad are seven or eight miles long and several miles wide. The ease and speed with which any item in such an area can be found is the test of its marking and layout. Any marking and layout scheme, therefore, must be able on the one hand to locate any building, section, or other storage space in an area of 20 or 30 or more square miles, and on the other to indicate in what bin and floor of a particular storage warehouse a certain grade and make of pencil may be found. The scheme must be accurate, logical, flexible to fit different conditions, and indefinitely expansible.

Such expansibility, however, involves the use of larger and larger divisions of space,—each one well defined and bearing a definite relation to each other one. Such standardized gradation has long been established in the army in dealing with different sized groups of men. It has never been done in dealing with different sized divisions of storage space. To meet this new need the terms defined are offered as a step toward a generally accepted classification of storage spaces. They comprise seven steps from a "unit" (of perhaps one square yard) to a "tract" (of perhaps 40 square miles). The possibility of designating any square yard ("unit") of storage space in an area of possibly 800 square miles (20 "tracts") by seven letters of the alphabet, indicates the practical simplicity of the scheme outlined in the instructions. The utility of any such scheme, however, depends on the consistent application of the fundamentals outlined and discussed.

I. DEFINITIONS

Introductory

IN thinking of a layout, think of a checkerboard. The size of the layout would determine what divisions (as defined below) the checkerboard would represent.

If the checkerboard represented a "section" the individual squares would represent "units," arranged in "rows" (without showing, however, the aisles necessary to give direct accessibility to each unit).

Turn the checkerboard, or half of it, upon edge—and you have the front view of a row of bins arranged in "tiers," each column being directly above a unit area.

In case of a larger layout, the checkerboard might represent a "field" (instead of a "section"). Then the individual squares would represent "sections" arranged in "series."

In case of a still larger layout, the checkerboard might represent a "tract" (instead of a "field"). Then the individual squares would represent "fields" arranged in "ranges."

1.—*Layout:* The arrangement of total available stores area into various spaces reserved for receiving, moving and storing and where necessary for assembling and shipping.

2.—*Unit:* The area adopted as a standard unit for building up the storage layout. It should be rectangular and will generally be the smallest storage space given particular identification. (see Figure 1).

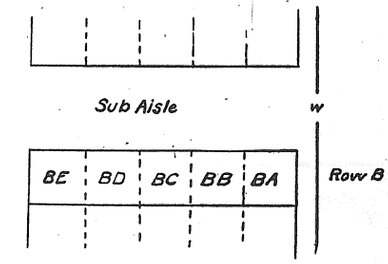

FIGURE 1.

A row (B) of units (BA, BB, BC, etc.)

[1]Reprinted by permission from bulletins issued by the Storage Committee, War Industries Board, for the use of supply officers of the Army and of the Navy.

[2]Assistant Professor of Business Organization and Management at the Amos Tuck School of Administration and Finance, Dartmouth College, Hanover, N. H.