If you will just get that one point, it is considered as a summarized cross-index of all the work planned by machines on the one hand, in the same room or in some other room, plus some information as to jobs that are scheduled to be done—and every job should be scheduled as soon as it is ordered; then you will have a balance of work.

You understand the present use of the planning board: planning work ahead of individual machines. In some places it is done by using three pairs of hooks for each machine, the first pair of hooks representing the job on the machine, the second pair the jobs at the machines and ready to be done; and the third pair the jobs assigned to the machine but not yet ready to be done, because some previous operation is not completed. That part of it, I take it, we all understand.

Right there, I wish to say, another way of getting the same result (you may not call it orthodox) with a whole lot less wall space, would be to use one pair of hooks for a machine, representing the job on the machine, and the jobs ahead of the machine, and, if you please, the jobs assigned to the machines but not yet ready, although the latter is something that I personally don't believe in. I believe in one pair of hooks representing the jobs on the machine and jobs ahead of the machine. I have been converted to that within the last two years, and I think I know something about using planning boards because I happened to be a party to the first planning board that was ever operated.

Mr. White asked the question as to why one uses four weeks as a period to be covered in these balance of work statements. You can use one day or one year, or any period of time you see fit. Ordinarily, four weeks is the period covered, although in one of the last jobs I was on it was found that three weeks would be ample, and it simplified matters considerably. So the report was made up on a three-weeks basis.

I can't help but again refer to the importance of recognizing that the balance of work, as I have outlined it, is a cross-index. In a way, it might be compared to Gantt's layout sheets, and I am familiar with those because I had the privilege of working with Mr. Gantt for several years.

Flexibility is one thing you can't easily get with a layout sheet, but you can get flexibility with the ticket arrangement on boards.

I don't know that there is anything else that hasn't been answered. I should advise that this paper be carefully read if anyone is interested. You can enlarge on all of those three elements that I spoke of: namely, machines, labor and tools. Through further development you can even handle the sales end of it and have the benefit of contemplated business. There seems to be unlimited possibilities in the balance of work and its benefits.

CONCERNING the business values of the collective bargain, Tead and Metcalf in "Personal Administration" (p. 450), write:

> If it is true that the individual bargain places upon management an impossible burden of responsibility, it is necessary to see whether the collective agreement is of value in reducing this burden. What are the ways in which it may have business uses?
>
> First, the collective agreement tends to equalize the bargaining status of workers and employers. Surprising as it may seem this is of advantage to the employer. It is an axiom of good business management that effective production depends in the long run upon a relationship between the interested parties characterized by a high sense of mutual self-respect, regard for individual dignity and equal status.
>
> "The real basis of equality in a democracy," it has been well said, "is not equal pay, but equal dignity of function." That sense of equal dignity and mutual self-respect is at the same time the basis of goodwill in joint relations, and the result of bargaining on a basis of approximate equality. Equal bargaining power may and should thus mean a relationship of goodwill and personal amity. Where this is not the case, where under a joint contract there is constant friction and quarreling, the difficulty is usually not due to the collective feature, so much as to those natural personal clashes and bickerings which have really nothing to do with collective bargaining as such. Only among equals can there be true loyalty, permanent interest in the joint enterprise, continued regard for the personal aims of each individual in relation to the common purpose of the group. . . .
>
> Again, only among equals can there be justice, or a sense of the possibility of obtaining justice when differences arise. A group's conception of what constitutes justice will admittedly change from time to time. But that does not alter the fact that what they now think is justice is vastly precious in their eyes; and that the conditions or terms under which they work and the system under which they live are unjust. Such a sense of injustice is certainly somewhat modified by the use of collective dealings; even if some other type of relationship may eventually be necessary to satisfy later and more exacting conceptions of a just industrial order.
>
> To the extent, therefore, that joint dealings create a sense of equality and justice, they may contribute as nothing else can to the creation of goodwill and a cooperative spirit in the process of production. And, once the negotiations are completed and terms agreed upon, there is every advantage to both sides in fostering this atmosphere in the shop under which alone the work can go forward quickly and well.

THE NECESSITY FOR STANDARDS IN THE RELATION BETWEEN ILLUMINATION AND OUTPUT[1]

by

WARD HARRISON[2]

ARTIFICIAL lighting is often judged as good or bad depending upon the degree wherein it differs from the daylight conditions to which we are accustomed. Granting for the present that such a basis of valuation may be a reasonable one, it is of interest to investigate the most usual differences between daylight illumination of interiors and its substitute. The two most common points of differences are: first, lesser diffusion of light—that is, small sources of high brilliancy cause glare and objectionable shadows as contrasted with the large light-giving areas of low brightness, such as the windows; second, lesser quantity of illumination both on the work and on adjacent surfaces. Inferiority in respect to diffusion of light (glare), altho almost universal, is unquestionably a matter of neglect or of misapprehension of the principles of illumination, for today well diffused light costs little if any more than the other variety. On the other hand, the question of the quantity of light to be supplied is usually considered to be an economic one. True, a certain minimum illumination is necessary to provide against accident, and should be supplied without regard to cost, and for certain operations a considerably greater amount than this minimum may be required to conserve the vision of the employees. In passing it may be noted that both of these factors are now recognized in the industrial codes of several states. On the other hand, the experience of those who have investigated the subject most thoroughly is that in the majority of industrial operations it is not either one of the foregoing factors, accident prevention or conservation of vision, which should finally fix the quantity of illumination to be supplied in a given case.

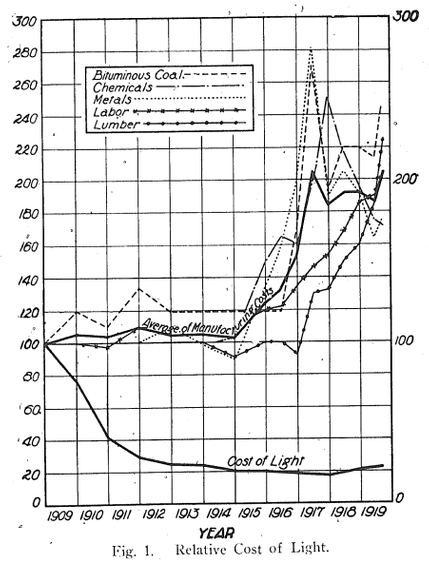

Fig. 1. Relative Cost of Light.

In examining the works of a watch we almost involuntarily move over toward the window, although the illumination at all points in the room may be far above that ordinarily required to prevent eye strain. *We find that we can see more with increased illumination.* An examination of the Snellen's Chart under two degrees of illumination, say one foot-candle and ten foot-candles[1], will serve to confirm this belief. Again,

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[1] A paper presented at the Rochester, N. Y., meeting of the Taylor Society, May 7, 1920.

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[1] The foot-candle meter (Fig. 2) is a small, portable instrument which measures illumination directly in foot-candles. Since the foot-candle is rapidly becoming recognized as the popular as well as the scientific measure of illumination, this meter is a very practical measuring instrument. Technical knowledge of photometry is not required in its use because the adjustment is simple and determinations are made without the assistance of mathematical calculations. The foot-candles of illumination at any place are indicated by the point where the spots on the foot-candle meter screen change from brighter than their background to darker. The scale reproduced in Figure 3 indicates an illumination of nine foot-candles.