

used, enabling the observer to expose at any desired speed, according to the amount of lighting or speed of the worker. It is not uncommon to take photographs at speeds lower than sixteen frames per second whenever necessary, either with the aim of economizing on film or of increasing the length of the exposure to avoid the use of artificial lighting, if the speed of the operator permits it. On the other hand, it is often desirable to make exposures at a rate higher than sixteen frames per second for the purpose of slowing down the fast movements. In these cases it is very important that the clock be placed in the field of the camera in order that an accurate time record may be made.

Some of the early clocks used were made under the supervision of Frank B. Gilbreth and consisted largely of parts from the common clock in everyday use with a dial graduated into one hundred divisions and a hand turning at a rate of twenty revolutions per minute. These spring driven clocks are usually accurate for a period of ten to fifteen minutes and then begin to slow down.

An electrical clock has been developed recently which is exceedingly accurate because its motive power consists of a small synchronous motor, operating on a frequency of sixty cycles. Its dial is also graduated into one hundred divisions and its mechanism operates three hands. One of these makes twenty revolutions per minute, the second makes two, and the third makes two-tenths of a revolution. In spite of its accuracy this clock has some undesirable features in that it is necessary to have an attached cord to connect it with the electric current. Also, it will run only when supplied with current for which it is designed. The older spring motor driven model, although not accurate for a period longer than ten or fifteen minutes, has an advantage over the electric clock in that its use is not limited to the kind of current available. However, this is a relatively minor problem and no difficulty need be experienced in selecting a clock if the conditions under which it is to operate are considered beforehand.

When the film is returned by the manufacturer who develops and reverses it into a positive, the data are transferred from the film to what is commonly known as a Simo chart for the purpose of making a visual record of the complete cycle. This chart shows various elements in the cycle as they occur, simultaneously for each hand, and the

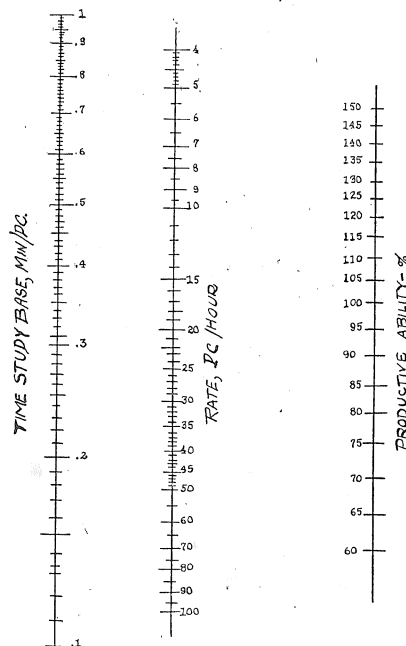
amount of time required to perform each in units of one two-thousandth of a minute, together with a brief description of these elements. The elements are usually indicated by symbols, thus avoiding the use of coloring or cross hatching. For working purposes these are entirely satisfactory in making an effective analysis.

### A Time Study Chart

By E. K. STERNE

Grigsby-Grunow Company, Chicago, Ill.

THE purpose of this chart is to aid the time-study man in figuring the final result on studies. It can also be used in the shop for approximating rates during preliminary observations. To use the chart, the base synthetic time



must be figured and the allowances added to it. This gives the time base. From this figure on the chart a straight line drawn through the productive ability gives rate in pieces per hour. It will be noticed that these lines are divided logarithmically, and so are of unlimited range. If the figure for the time-study base of the particular study does not appear on the chart, some multiple of ten of the figure does appear. For instance, the time study base is .023; this figure does not appear on the chart, but .23 does appear. Therefore, you must multiply your figure by ten to correspond with the chart. This will necessitate multiplying the result obtained by the same figure. Care must be taken in reading the result, as you will notice that the outside scales progress upward while the center progresses downward; that is, on the time-study base scale, .25 is above the .2 while the rate of 25 pieces per hour is below 20. This must always be kept in mind when reading your results.

I have been asking my friends to use this chart and let me know the results. My thought was that the members of the Taylor Society might find it of some use if it were presented to them in the BULLETIN.

### Taylor Society Guest Heads New Scotch School

PROFESSOR James A. Bowie who was our guest and an able speaker at the Taylor Society dinner in Philadelphia, has recently taken up his duties as principal of the New School of Economics and Commerce at Dundee, Scotland.

The school is designed to promote, both by teaching and research, the study of all problems bearing directly on the conduct of modern business. Courses of instruction are of university grade and it is hoped that the School may become a new Scotch center of economic and industrial study and research. It is hoped also that it may become a center of higher commercial interests for a larger constituency than its immediate students and has provided in its equipment meeting space for those interested in commercial affairs. The School further aims to show the practical applications of economic principles in such a manner that its students will be better qualified to solve the numerous problems that must be faced in the management of the modern business enterprise.

### News of the Sections

The New York Metropolitan Section of the Taylor Society began the year with a meeting attended by more than one hundred people at the Fraternity Clubs on October 15. Dr. Person reported on his European travels and as a result gave his ideas on international stabilization. Walter N. Polokov, who has recently returned from an extended stay in Russia where he was doing consultant engineering work for the Soviet Government, spoke out of his experience on the same subject. Lively and stimulating discussion followed the formal talks.

At a November 12 meeting Virgil Jordan, Economist with the McGraw-Hill Publishing Company, will continue the discussion with a talk on national planning. The meeting, which was originally planned for the nineteenth, was put forward in order that we might join with the N.A.C.A., S.I.E., A.M.A. and the Management Division of the A.S.M.E. in a joint meeting at the Hotel Edison on November 16 to hear John Carmody, Editor of *Factory and Industrial Management* and President of the S.I.E., on "What American Business Can Learn from Management Methods in Russia."

### Reviews

*The Problem of Unemployment.* By Paul H. Douglas and Aaron Director, The Macmillan Company, New York, 1931, pages xix, 505.

It looks to me as if Messrs. Douglas and Director have finally supplied for the United States a fitting companion Bible on unemployment to Sir William Beveridge's "Unemployment, a Problem of Industry" in England. This new book cannot be too highly commended for the breadth and comprehensiveness of its treatment and the fairness of its outlook, even though some may feel that it is tainted with too pink a hue of liberalism.

The discussion includes a consideration of the extent of the cost of unemployment which is a splendid popular statement of the present situation.

The discussion of seasonal unemployment brings together in a convenient way the recent experience in the alleviation of seasonality.

The discussion of technological unemployment seems to me particularly fair and informing. The authors can find no trace as yet of an absolute increase in the percentage of unemployment due to this cause. But they recognize fully the temporary difficulties into which scores of individual workers fall due to the perils of trying to shift quickly from one job or one industry or one locality to another.