

Tabor Manufacturing Company, is so scantily represented—in fact is conspicuous by its absence—in this book. This is not for our benefit, for we already know in detail exactly what happened and why, but we believe that if he will state fully just why it was necessary to do much time study all over again, it will be a worthy contribution to the subject of time study, a most pertinent addendum to this paper, and a most valuable document for the young engineers entering our profession.

61. Mr. Kent will probably answer that it is neither his duty nor his place to tell this, but we feel that it is only just to micromotion study that such a fair, friendly, well informed judge as is Mr. Kent should thus open the way for impartial critics to compare and evaluate the two types of data from the standpoint of recording the surrounding conditions and the possibilities of using such data from the standpoint of permanence.

62. We will state that we have never had reason to change our original methods of recording all the surrounding conditions in the greatest detail that attend any time-study and motion-study observations, as practiced in the beginning of our motion picture experience, when Mr. Kent had his most intimate knowledge of our work. Not one micromotion study that ever has been taken is any less clear, complete and understandable today than it was in the days when it was first developed. Furthermore, these studies permit re-grouping the subdivisions of the operation in any desired manner or sequence, and give results that are fully as efficient as new studies for recording the phenomena of behavior.

63. In paragraph 3, Mr. Kent says "There is time study and time study." Now let us remember the accepted time honored definitions of time study, namely, "time study is for rate setting;"—"Time study is the art of determining how much work a man can do in a day;"—and the confirmations of these definitions in the first paragraph of Mr. Barth's discussion. We will now again call attention to the fact that the purpose of micromotion study is finding the One Best Way to do work; and that the errorless time observations are a free by-product; therefore, the balance of Mr. Kent's discussion,—all that is contained in his paragraphs 3 and 4,—must be read with the full appreciation that he is here talking only of accuracy of times, without mentioning the features of motion study and trans-

ference of skill, which he compliments so highly in his paragraphs numbers 1 and 2.

64. He is perhaps unaware of the fact that we now have various sized cameras, some of which are very small, and that we can take as few records as are desired. Some photograph on film, others on plates, and for those who desire lowest cost, we can now photograph a negative or positive direct upon the paper. Surely, in the light of his experience with voluminous quantities of stop-watch time study records, where the surrounding conditions were not recorded, and were found unusable when old, Mr. Kent is not serious in even suggesting not taking a snap shot with the micromotion apparatus as often as he would press a stop watch. Perhaps he will still say that he does not know how to develop the pictures after he snaps them. If this is the case, we will agree, as a matter of long friendship, to have our organization in our laboratory develop them at cost or, as a matter of business, we will furnish him the entire apparatus for taking, film and developing and printing complete, to make time studies, for what it costs him to do it with a stop watch.

65. As for paragraph 4, we accept what Mr. Kent says about the two-foot rule and the piece of wood, but his comparison is irrelevant because for cutting only one piece of wood, under the conditions which he describes, there would be no need to record the surrounding conditions. Furthermore, because one has a machinist's scale is no reason for cutting a piece of wood to the sixty-fourth of an inch, when the tolerance is plus or minus a quarter of an inch. He has met our views exactly, however, in his last sentence. By all means let us use "the tool best suited for the job in hand." Therefore, for temporary and guess work, where it is desired to have no data of tools used or motions, or any record of surrounding condition, we recommend the stop watch. For work where accuracy and permanence of complete records are essential, we recommend the micromotion method, it being always remembered also that we recommend taking micromotion records of the best man obtainable only. The skill of the super-expert is too valuable, for further use in the present and the future, to be missed. We thus secure by-products of the records, that alone more than pay for the price of the entire micromotion procedure.

REPLY TO MR. COOKE

66. Mr. Cooke labels his discussion of our Indictment "Make Time Study Open and Above Board," but he is not fully consistent. He lays stress upon Dr. Taylor's "Being absolutely opposed to secrecy in time study when the results of such study were to affect in any way the wages to be paid to the individual on whom the observations were to be made," but does not state that it is not ethical to take secret time study on any man, whether it will affect his wages or the wages of his colleagues or not. Whether it is ethical or not, the workers consider it unethical, and even the advocates of secret time study admit that it hinders hearty co-operation "when the workers find it out."

67. We know of no case where taking secret time studies is justified, whether or not it affects the group of men on which it is taken, and what is more, such time study data are quite valueless from any standpoint.

68. We are glad that Mr. Cooke agrees with us that there is no excuse whatever for secret time study under any circumstances. We are opposed to it on principle. We have never practiced it, and any instance that can show any excuse for it simply shows the inadequateness of the previous time study that it is supposed to check.

69. The existence of a vestige of desire for secret time study of any kind simply shows a complete ignorance and disregard of the possibilities of hearty co-operation of the worker combined with micromotion time study that records all of the details. This was one of the subjects of our first meeting and conference with Dr. Taylor, and we have continued holding our same views ever since.

70. We regret exceedingly that Mr. Cooke does not take this occasion to declare himself on the subject of the desirability of accuracy of timing and recording in such permanent form that the workers can see for themselves and understand all of the motions and surrounding conditions of these errorless times from which tasks are set for mutual benefits.

71. We are greatly disappointed that he does not express himself on the desirability of having these records in such physical shape that they can be shown to the workers, that they may receive the benefits of "education thru the eye" which they so sorely need, of the new world of knowledge regarding their crafts

and skill. It can hardly be said that Mr. Cooke has not had time to make up his mind, because he saw our micromotion data nine years ago.

72. We believe that the management engineering profession ought to hear what methods are used by Mr. Cooke in solving problems of skill in millions of possible combinations and permutations of therbligs or cycle subdivisions of the five-second cycles of the garment industry. Does he attempt to find the scheme of perfection of motion of this most highly repetitive industry by means of Mr. Barth's algebraic method recommended by Dr. Taylor in 1903 in spite of its complications, and based on erroneous original times, with no accurate data on the tools used and surrounding conditions existing? Or would he consent to recommend five feet of film for study, with every subdivision recorded automatically as to tools, surrounding conditions and times obtained by merely turning the handle of the camera?

73. He apparently stands for "less mystery." There is no mystery whatever regarding times and methods derived photographically.

74. Mr. Cooke's discussion would lend weight if he had expressed his views on Prof. Spaeth's statement that "the stop watch is already far too accurate," and it would have been particularly fortunate if he had stated that, other things being equal, the greater the accuracy of all fundamental data, the better. We wish he had stated his position regarding the statement of Mr. Barth, who says that he does not take Dr. Taylor's statement seriously, and whether he agrees with Mr. Barth or with us that Dr. Taylor was right when he stressed the importance of "unit times" as quoted in the opening paragraph of our paper. We also wish that he had expressed himself concerning the fact that there is practically no machine work in the garment industry that has not handling time that runs concurrently with the machine time, as emphatically as Mr. Barth and Mr. Merrick emphasized the absence of high percentages of handling times in certain branches of work in an arsenal.

75. Regarding Mr. Cooke's invention of a barking stop watch, we note with much interest that his stop watch neither barked nor wagged its tail at the principal topics of discussion of our Indictment.

76. We thank Mr. Cooke for his discussion of the reference to secret time study in our paper. May we assume that he accepts all of the other parts of our indictment of stop-watch time study, since he in no wise objects to it?