cussion of the questions of Scientific Management, and on several other important occasions, Dr. Taylor selected us as his personal representative to handle for him and in his interests his side of the argument, and to explain and answer oral, written and printed questions, without special conference with him at the time.

5. A further indication of Dr. Taylor's approval of our fitness to make decisions in management was his asking us to join him in writing a book on our subject of motion study, which he had never recognized or considered, combined with his subject of time study, which we had never recognized or considered. This exceptional honor, which we have always fully appreciated, we were obliged most reluctantly to decline.

6. In paragraph 1 Mr. Barth has put on record what we have always contended, what Dr. Taylor said, until he changed his views in 1912, and exactly what his "direct disciples" have always believed and practiced, not only before 1912 but also ever since, that "the object of time studies is to determine a fair time to allow a worker for the performance of a task"; or to determine "how long it takes to do work," as set down by Dr. Taylor in "Shop Management." Dr. Taylor changed his viewpoint, as is recorded in his discussion of paper 1378 read before the American Society of Mechanical Engineers in 1912, which we shall discuss at length in our forthcoming "Management Commentaries," but his "direct disciples" still hold to his original views.

7. We have always maintained, and the discussion herein now confirms our contention, that the "direct disciples" have no conception whatever of motion study, other than something that "is the same as time study." Time study does not record elements of skill. *This one thing is sufficient in itself to distinguish the two for all time.*

8. Mr. Barth, now, in 1921, with the statement undisputed by the Philadelphia Section of the Taylor Society, and *"fair time to allow,"* underlined by him, has recorded for all time without ambiguity and beyond recall, that "Time Study is for Rate Setting." That is the exact title of Mr. Merrick's book. There is no question, therefore, that the statements in our paper are justified.

9. It is interesting to note, in paragraph 2, the stress on individual differences. This is indicative of a fundamental change of thought in the entire world in the last ten years. It seems doubtful if he is cognizant of its implications. In this paragraph Mr. Barth states that the fact that no two workers accomplish their work in the same time, is sufficient reason for accepting inaccurate time study made by the non-condition-recording stop watch. Can it be possible that he still does not recognize the great advantages of the micromotion method, which not only does all that the stop watch does, and this without error, but records all the surrounding conditions, which also may show the very *cause* of the lack of regularity? Can he not recognize that times are different, usually, because methods are different? Can he not recognize that without the conditions being recorded the best portions of methods cannot be selected for the One Best Way? Can he not realize that quality of method and speed at the time are always confused, with stop watch times? Can it be possible that he still fails to recognize that *perfect accuracy* of minute times is *not the direct product* or the chief aim of the micromotion method, but is a *free by-product* of the record of the motions, that defines absolutely and in detail the method on which the "fair contract" is based? We are not losing sight of the great benefits resulting from the "task" or "program" or "time-table," but they should be, and for best results must be based upon the clearly identified subject matter of a fair contract based upon recognizable facts.

9a. With the micromotion method, the contract *is* fair and the minds of the contracting parties *have* met, because the method to be used is identified on the film. With the stop watch method if a "fair contract" means merely an agreement between the employer and employees that the employer will pay the employee the high rate if he makes the number that is called for in the task of a quality that suits the varying whims of the management, then there is also a contract.

9b. Many "tasks" or "fair contracts" are not fair because the method which is supposed to be clearly identified in the instruction card "is not identified at all so far as the motions to be taught and to be used are concerned." For example, the "instruction cards" as shown in Mr. Merrick's book "Time Study for Rate Setting" do not identify the motions at all. If the "fair contract" is not based upon a definite method and sequence to be used to obtain the task time, the minds of the parties have *not* met. Furthermore, unless the tolerances and inspection are clearly circumscribed,

the minds of the employer and employee have not met and there is no real agreement or fair contract.[1]

10. The two reasons summed up in paragraph 3 for establishing a "degree of accuracy," "in reaching a satisfactory time allowance for a task," i.e., variation between workers and unevenness of the individual worker, neither excuse stop-watch time study for its inability to time the activity accurately, nor belittle the usage of the micromotion method in recording all such differences in errorless unmistakable detail, along with the likenesses, as fundamental data for determining the One Best Way. Here again Mr. Barth *emphasizes his one thought,* namely, *time study* for *tasks.* There is no thought or mention of observations for the worker in his learning period; no thought of recording comparative data as to merit of method; no thought of exposing the best that has been done to the learner; no thought of having a detailed ideal of method to come to; no thought of tapping the infinite experience of the workers of the present and all succeeding generations of workers' cumulative progress in method. No! Only "time allowance for tasks," and "fair time to allow a worker for the performance of a task" and "task within the time allowed," and "if he falls short of performing the full task within the time allowed."

11. The task does excite the workers' ambition and desire to do the work "in the time allowed." The task does not educate him in the best method that has been done, as a base line, upwards from which he may use his inventive ability and experience for advancement. Our paper is not merely about tasks. There is an endless amount of work possible before and after the quantity of the task is established that is of the greatest importance, even if tasks are never set. Yet Mr. Barth ignores, with the apparent approval of the Taylor Co-operators, the principal feature of our indictment of stop-watch time study. Is it because they refuse to see the educational feature and the importance of recording in detail the One Best Way to do work,—or do they prefer to confuse the issue by discussing only the much less important feature of "Time Study for Rate Setting?"

12. In paragraph 4, it is no more fair for Mr. Barth to infer that we condemn stop-watch time study "merely" because we have invented "a far more accurate time measuring device," than it would be for us to say that he defends the stop watch because he has co-operated on a book on stop-watch time study and has put himself on record for all time as endorsing such inaccurate methods. As a matter of fact, the invention of the micromotion method did not come for several years after our condemnation to Dr. Taylor of his stop-watch time study method, and our promise made to him in 1907 that we would design a time study device that would do away with all the faults, inaccuracies and mistakes of stop-watch timing.

13. Note that Mr. Barth now completely concedes the superior accuracy of the *devices* of our method.

14. In paragraph 5 the fact is emphasized that the industrial engineer often has to be satisfied with second best. In what way does this prove that he must or should be satisfied with the inaccurate, non-recording, rule-of-thumb stop watch? Equipment is stressed, therefore, evidently because the newer devices are thought to be too costly, or too difficult to secure, operate or install. We have answered all these objections in our original paper.

15. From paragraph 6, it is evident that the micromotion method is objected to as being too costly. The comparison of the stop-watch time study man to the astronomer and biologist is very flattering,—to micromotion advocates as well as stop-watch men. It certainly implies that only lack of funds prevents the latter from acquiring the more accurate apparatus, for surely no astronomer would remain without a telescope, no biologist without a microscope, if such could be secured, because the micromotion method will pay for its entire cost almost from the beginning of its use. But this is not really a parallel case. It is true that a scientist is a scientist even though he has *no* apparatus, but we maintain that no scientist would *advocate* using unnecessarily inaccurate methods and devices when accurate are available. It is not the question of his *possessions* but of his *attitude* that we are discussing. Does Mr. Barth wish to convey the idea that a time-study man "because of his own poverty, or that of the institution with which he may be connected, is unable at once to secure the very latest and best equipment for his research work," is warranted in going to some of our great colleges and universities and misleading students and their teachers

[1] "The minds of the parties to a contract must meet as to all of its terms.
Lord vs. U. S. 217 U. S. 340.
Fire Ins. Association v. Wickham, 141 U. S. 564.
Minneapolis etc. R. R. v. Columbus Rolling Mill, 119 U. S. 149.
Eliason v. Henshaw 4 Wheaton, 225.
Wheeler v. New Brunswick etc. R. R. 115 U. S. 29.
If any portion of the proposed terms is not settled, or no mode is agreed on by which it may be settled, there is no agreement.
Barrow S. S. Co. v. Mexican Cent. R. R. Co. 134 N. Y. 15."