Shorter Hours and Production

How the length of the working day should be determined—need for a scientific basis on which to base conclusions —evidence in favor of a shorter day.

By J. W. MACMILLAN.

Two considerations must, in the end, determine the length of the working day. One of these is the welfare of the worker, the other is the amount of production. Each of these sets limits beyond which it is impossible to go. Hours so long as to break down the health of the employee cannot be allowed. Nor can hours so short as to lessen production beyond the point necessary for the provisioning of the community. The workers could not stand twenty hours a day, nor society one hour a day. The problem is to find what period, will at once serve the interests of the producer and of the consumer.

It is very possible that no single period can be set for all, or even many, industries. Varying conditions of labor, strain of effort, constancy of attention, or monotony will differentiate between one occupation and another. It is evident that work in the open air is more wholesome than indoors, and that skilled tasks where the artisan is half an artist supply certain essentials of human experience which are lacking in mere drudgery. A teamster, whose hours are mostly spent riding slowly through city steets, may well work a longer day than a coal miner. The engraver, who etches a design upon a metal plate, may find in his work what the printer who strikes off the impressions of the design on paper may not find. It may be that the demand for an eight-hour day may split into a number of demands, in which the length of the day is fitted to the employment.

Factory work, however, is more or less of the same character in many industries. It is always indoors. The machine controls the man. Increasingly the worker is becoming a machine-tender. It is reasonable, in studying the question, to accept as a preliminary hypothesis that a standard working-day may be adopted for factory work.

The great need is to reduce the study of the problem to a scientific scale. So far it has been of an impressionistic nature. Isolated, and perhaps exceptional, instances of the success or failure of attempts to shorten the hours of labor are quoted. Each protagonist is at the mercy of his wishes or preconceptions. There is no body of collected data before which honest seekers after truth may sit down like little children. Careful and disinterested scrutiny of the effects both upon the worker and his output must be made and submitted to intelligent criticism before we shall be in a position to pin our faith to any policy.

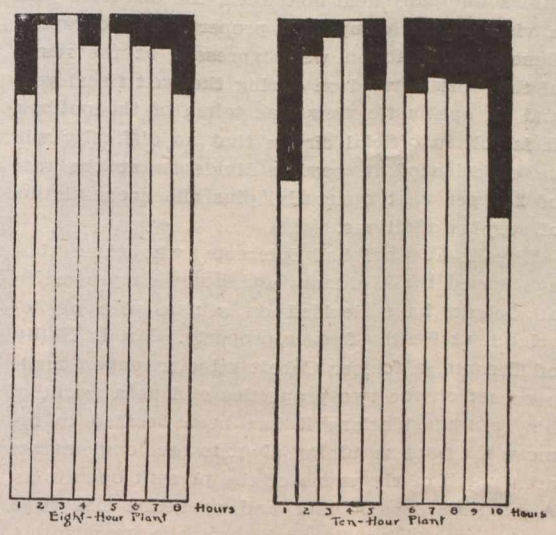
It is going to be difficult to accumulate the facts required on the side of the welfare of the individual. In what does human welfare consist? Is it simply a matter of physical health? Are we to agree that a vast body of our fellow-beings are to be nothing but factory-employees, of high efficiency indeed, but allowed to cultivate their souls only after the requirements of the factory have been met? Or, if we concede that each worker has the right to live a wholesome human life, apart from the method by which he earns his daily bread, what are the essentials of culture which are to be allowed him? The answer to this last question varies from age to age, and the prevalent answer determines the standard of living of the society which gives it. The people of the Roman Republic gave one answer. The people of the middle ages gave another. The Japanese have a different answer from the French, and the Italians from the British. Or, again, is the cultivation of the higher areas of life to be sought in employment rather than outside it. Were we to have a Montessori method in industry, the longer hours would become welcome, or at least unobjectionable?

Such questions as these are complex and subtle but they are not unanswerable. They set one of the hardest problems of industrial sociology, but there is no need for despair as to its ultimate solution. The role of man in society is being studied today after the fashion in which chemistry and geology have been studied in times past. Human nature and human association are giving up their secrets even as the metals and the strata of the earth have given up theirs. The laws will yet be formulated by which we shall be able to order intelligently our work and our play, our risings-up and our sittings-down.

Fortunately the other consideration in the problem of the length of the work-day is not nearly so abstruse. Comparisons can be made between the output of men working eight hours, ten hours, twelve hours, and six hours, under the same conditions, from which the maximum production may be discovered. One such study of the highest authority has recently been made and its results published. It is but one item of information, and will doubtless be followed by others of like character. In time there will be assembled such a mass of reliable data as will settle the question as to what is the time in each day in which a worker in a factory does most work.

This study issues from the United States Public Health Service. It was made under the direction of Professor Frederic S. Lee of Columbia University. Such trained investigators as Dr. Philip S. Florence, Josephine Goldmark and Mary D. Hopkins did the field work. It is impossible to impugn either the good faith or the competence of the statistics gathered. It is not claimed that this one investigation decides the general question. but it is claimed that it affords something which is scientific, and is therefore worth more than a million guesses and impressionistic estimates.

The following diagram shows the relative maintenance of output:



Maintenance of output in an eight-hour and ten-hour plant—The plack spaces in each column show how much each hour falls short of maximum efficiency.

Two factorys are compared. We are not told where they are located, nor what particular article they produce. They were chosen as being alike, except that one of them worked on an eight-hour schedule and the other on a ten-hour schedule. The comparison is altogether in favor of the shorter work-day.

It will be seen that the prominent feature of the eight-hour system is the steady maintenance of output. This is most evident at the beginning and end of the day, though it is also noticeable at the end of the morning and beginning of the afternoon periods. The report also mentions that under the ten-hour system restriction of output is practised widely, whereas under the eight-hour system output varies more nearly in accordance with individual capacity.

An important part of the report deals with accidents. It has long been known that the liability to accident increases with fatigue. So it is not surprising to learn that the accident-rate is greater in the ten-hour system than in the eight-hour system. If it were not for the element of fatigue the reverse would be the case. Normally, accidents vary with speed of production. This is but natural, as the exposure to risk is increased. If the hazardous operation on a machine occurs oftener in a given time, as it must do with increased production, the risk is greater and the accidents will be more numerous. But, when fatigue begins, a new factor of risk is introduced. So it happens that accidents increase as speed diminishes, and the afternoon, with lessened production, brings more casualties. The same thing is shown by the larger number of accidents which occur in muscular work as compared with dexterous or machine work, and in the night-shift rather than the day shift, where, as is commonly the case, the night shift is the longer of the two.

It will be objected that there may have been something distinguishing these two factories besides the length of the working day. Factories differ considerably in their output even when working the same hours. There may be differences in organization, in the speed to which the machinery is geared, in the spirit of willingness of the workers, or in their relative capacity. To be sure, the designers of this experimental comparison satisfied themselves as well as possible that the conditions were precisely alike in the two factories. But, even so, it will be felt that something might escape their notice. Mental attitudes are not easily comparable, and in spite of identity in organization and machinery the will-to-work might vary sufficiently between the two plants to account for a considerable difference in production.

Their answer to this objection is derived from a comparison of the day and night shifts in the ten-hour plant. Here the night shift is twelve hours long. The report argues:

"That it is the greater length of hours rather than the difference of management which accounts for lessened output at the ten-hour plant is strikingly evidenced by the contrast between the night and the day shift at the same factory. At night, on a twelve-hour rather than a ten-hour schedule, we have reactions on the part of the workers to the longer hours closely resembling their reactions to a ten-hour as compared with an eight-hour schedule."

It is now a long time since Robert Owen put forth the doctrine that, within limits, production increased as the working-day decreased. During that time the normal working-day has steadily been shortened. Sixteen and fourteen hours became twelve, twelve became ten, ten became eight. All the while production has increased True, the question is complicated by reason of improvements in machinery. Yet the evidence is, on the whole, in favor of the shorter day.

It is unfortunate that the bias of unscientific belief is against the shorter day. Very few employers seem to have the slightest doubt but that any lessening of the work period means a propor-

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