

Conquering the Long Day

I

There is nothing more refreshing in the present jangling world than to find a man who does the thing the rest of us content ourselves with declaring should be done--a man who will sit aside and patiently work out a cure for the evils against which we inveigh. And there are many of them, many of them even in the troubled realm of human industrial relations where politics, force, law are too generally regarded as the only lines of attack.

Take this matter of the long day, the 12-hour shift, that not only leaves a man "dead tired" but keeps him from his fellows, from town activities, from an opportunity to enjoy even his wife and children. It is not law or politics that is solving finally the 12-hour shift; it is the engineer, that man whose business in the world is to know, to direct, to relate the forces which enter into the activities of men, and who in these latter days is coming to recognize that the supreme, essential force in his problem is the human being, and that unless he can handle him as successfully as he does his steel and timber, his steam and electricity, he cannot control his problem of producing useful things for the service of mankind.

For some twenty years now, engineers have been experimenting on this problem. For many of them it is a settled question. Mr. Arthur Jones of New York declared not long ago at a meeting of distinguished engineers that, in his judgment, the subject was as dead an issue as the Volstead act, that the advantage of a three-shift over a two-shift day are no more to be disputed than the conclusions of a Euclid theorem. Now, what are the experiences that had so convinced Mr. Jones?

Some half dozen years ago he took hold of a heavy chemical factory in Bayonne, N.J. His problem was to reorganize it on modern methods, make it more productive, if possible. The plant had a dozen different departments, and all classes of labor from unskilled to expert artisans, 68% of whom were foreign born.

Bayonne is a large industrial centre, with most of its industries continuous. There was not a plant in the place on an 8-hour basis, everybody worked 12 hours. Convinced that he could not get the quality of service that he needed in his re-organized plant from a man who worked 12 hours, he took a department at a time and, beginning with an educational campaign at the top, with the heads, he gradually transferred one department after another to an 8-hour basis, with the result that as fast as a department was transferred, its production so ran ahead that men actually had to be taken off and put into other

departments in order to balance the output.

There is a bulk of similar experiences on the part of many distinguished engineers. Analyze it and you find it answers all of the stock objections to the transfer from the three to the two shifts.

There is that, first of all, objection, "We can't afford it. It will cost more." But what does the experience of the engineers show? That invariably, when time has been taken and the transfer has been made thoughtfully and scientifically, that it not only does not cost more, but that it actually paid.

So eminent and far-seeing a consulting engineer as Morris L. Cook has declared: "

It is a simple problem in arithmetic to show that a 12-hour working day plus the time required to go to and from work plus time properly taken for eating and sleeping, leaves too little margin for the home life and recreation implied in American citizenship. We engineers are accepting this problem and without resort to anything but the engineering method we propose to remonstrate to the community through the experience of forward-looking men in one industry after another, that the long, two-shift day is wasteful from whatever angle it is viewed, or rather, that the three-shift, with its shorter hours and its conservation of men and material, is a paying proposition."

I saw Harrington Emerson write on a blackboard not long ago the statistical results of an effort of his in

transferring a continuous process industry from 12 to 8 hours.

The table stood as follows:

Reduction in hours	33 1/3%
Increase " wages	15%
" " production	37%
Decrease " cost	15%

Certainly, that looks as if this paid--to men and plant.

Material for similar tables were exhibited on this same blackboard at the same time by Robert Wolff, who for sixteen years has been proving his faith in the shorter day when handled with a science which is broad enough to take in men and their psychology. He shows such conclusive results, as far as cost is concerned, as a plant whose production was nearly trebled, going on the 8-hour shift, and this with an increase of only little more than 22% in the labor force. This is a point to note because one of the stock objections by the school of "It can't be done" is that the change from 12 to 8 hours always requires at least 50% more workers. And this is but one of a number of similar experiences of Mr. Wolff. That is, wherever you find an engineer who has revolutionized the hours in a continuous process factory, he will prove to you by figures that it does pay. But there are other objections to consider. There are the men. How about them?

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If the first objection to the transfer from a 2-shift to a 3-shift day in a continuous process industry is always, "We can't afford it. It will cost too much," the second is almost sure to be, "The men don't want it." Certainly, they don't want it if it means that their wages are to be cut. And they know that, inevitably, if the change from 12 to 8 hours is made arbitrarily, it must in the long run mean a reduction of wages. But take the men into consultation, show them how, by the re-organization of the factory, re-adjustments, economies, the filling in of whatever idle time they may have because of the nature of the process, with useful work; that is, prove to them what you mean to do in order to make the change economically possible, and not only will they want it but they will, as a rule, coöperate fully with you in securing it. But they must understand what you are up to. They must be convinced that the product they turn out is not going to be made more expensive by the change so that inevitably the increased cost will come, part of it at least, out of them. Your intelligent workman has little sympathy with a change for his benefit which is going to come out of the public. He knows that the public, in the long run, revolts against being overloaded for his benefit. Moreover, if he is intelligent, he knows

that he is one of the public. Show him how the engineer proposes to shorten his hours and keep up, perhaps even increase his pay, and you will have his coöperation.

Examine the work of the engineers who have made these transfers from the long to the short shift successfully, and invariably you will find that not only have the wages not been decreased but not unfrequently they have been increased automatically through the increased efficiency of the men. The men themselves watching results are not slow to see that economically there is in this scientific procedure an actual advantage from a money point of view as well as from a point of view of general welfare. "But, grant all that," your doubter says, "and what will he do with his leisure?" On the whole, just what other human beings do with leisure. He may at the start use it unwisely. Most men and women do when extra hours come to them, just as they use extra money unwisely when it first is put in their hands. But he, like other human beings, in time learns to use it. Getting home earlier, he has time for the refreshing process known as cleaning up, which under old conditions he rarely or never had. He has time to smoke his pipe with his wife and children after he has dined, time to go to the town meeting or his union or the library or

to sit at home if he is so disposed; time in the morning to tinker a bit about the house or work in his garden, as such a large percentage of men will if they have leisure and a piece of ground, particularly foreign born men.

There has been a frequent claim by objectors to the shorter shift that the men who had always been accustomed to working 12 hours hasten to take a four or six-hour job, so that the vitality and freshness which was depended upon to increase their efficiency was exhausted. Undoubtedly there have been cases of this. At the time of the very high wages in the ship yards, an occasional man was known to have a taxi waiting for him at the gate so that when his eight hours were finished in one yard he could drive rapidly to another and put in four or eight hours more. But the wisest and most experienced engineers that I have heard discuss this point claim that these cases are sporadic. Usually they are the result of some extreme pressure of need or of ambition on the man. I heard a university professor say not long ago, "Yes, such a thing could happen. A man sometimes finds himself in a tight situation, with extra expenses and burdens thrown upon him, and he must take on extra work to meet them. Or he has some ambition or desire, and he does the work in order to satisfy that. In our university, for instance, the whole faculty is suffering

with the rest of the world from the high cost of living, and almost every man has been obliged to take night teaching in order to live. But the great rank and file don't do this; they work eight hours and learn to use with more or less wisdom the leisure that they have gained."

An instant reaction in the mind of the average American manufacturer to the suggestion of more leisure for the working man, with as much or even more pay, is an alarm lest it open the door wider to foreign competition. Nothing seems to be more difficult to get into the mind of industry than that efficiency follows well-being. The superior productivity of the highly paid, scientifically directed American workman as compared with lower paid, arbitrarily directed foreign labor has been demonstrated again and again. Fear of foreign competition has been reduced or even cut out entirely in factories in this country under a careful reorganization, a feature of which was the shorter shift. Mr. Robert Wolff has an admirable example of this in his sixteen years experience. He took hold of an old, and more or less decrepit paper mill. The quality of the pulp was so poor that it could not withstand European competition, but under his able reorganization he brought the quality up so that from being, as he said, the worst pulp in the world it has become the best and has no trouble in meeting the competition of the

other side. The greatest part of this improvement in the quality, the management attributes to the difference in the spirit in the organization after it went on to three shifts. Under the long day the men were always tired, spiritless, neglectful; under the new order of things, they were always "on their toes," interested, and, like men on their toes and interested, productive.

As a matter of fact, there is not a conventional objection which has been urged against the shorter shift which has not been proved groundless, in a variety of continuous process industries which have been long operated on a two-shift basis, industries in which even the men themselves who had suffered most from the arrangement, had stoically said, "It could not be helped." The engineer, however, is a man who knows that when he says it cannot be helped, he is evading the question, that it is his business to help anything that is throwing too great a strain on any factor in his problem. When he awakened to the fact that the long shift inevitably caused a deterioration in the human force, he could not, if he was a real engineer, consent that there was no correction. The thing was wasteful from the point of production as well as inhuman. It worked as much against the quantity and quality of his product as against the family, society and industrial good will. He

had to do something about it. These of us outside who feel that the two-shift day works against the good of men and society have tried to correct it by fiat, but the engineer has nothing to do with fiat. His business is to prove that the thing that ought to be done can be done. Now, what has been the basis of his demonstration that the three shifts were profitable not only for the men but for the business itself?

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One of the fundamental misconceptions in the mind of the objector to a change from two to three shifts in an industry is his idea that all that is done is arbitrarily and immediately to cut down the hours. There is nothing scientific about cutting down hours. If a plant does that and does not change its methods, goes on operating under rule of thumb, of course the expense is greater. No engineer would think of changing his shifts on entering a plant. His business is to study his problem, cutting out leaks, reforming bad methods, introducing proper system of planning and despatching and routing, getting proper tools for performing tasks, throwing out antiquated machinery--working on the plant until it is properly equipped and organized. This done, the change can be properly made. I know of one plant, a printing plant, a kind of work in which competition is especially keen, where an engineer spent months solving problems of power, light, heat, humidity, the handling of materials, cutting out time honored wastes and perquisites, before he attempted to change his shifts. When everything was ready, he started his machine on the new basis, and, despite the fears of the manager, his costs were at once materially reduced and profits were increased.

Now, how could this be? In the first place he had

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There is nothing more refreshing in the present jangling world than to find a man who does the thing the rest of us content ourselves with declaring should be done,--a man who will sit aside and patiently work out a cure for the evils against which we inveigh. And there are many of them, many of them even in the troubled realm of human industrial relations, *the* War, politics, force, law are too generally regarded as the only lines of attack.

Take this matter of the long day, the 12-hour shift, that not only leaves a man "dead tired" but keeps him off from his fellows, from social activities, from an opportunity to enjoy even his own wife and children. It is not law or politics that is solving the 12-hour shift; it is the engineer, that man whose business in the world is to know, to direct, to relate the forces which enter into the activities of men, and who in these latter days is coming to recognize that the supreme, essential force is the human being, and that unless he can handle him as successfully as he does his steel and timber, his steam and electricity, he cannot control his problem of producing useful things for the service of mankind.

Convin ced of the scientific unsoundness of a 12-hour shift, more and more of our engineers have been experimenting with a re-arrangement of hours, particularly in those industries where, because they must go on continuously throughout the twenty-four hours of the day, it has been insisted that there was no escape from a long shift. Men said it was an incurable, though evil, factor in the nature of the processes. There are many of these continuous process industries, and so convinced have those engaged in them been that the two shifts were unescapable that even the men themselves who have suffered from the arrangement, have stoically consented. "It couldn't be helped," they said.

But the engineer knows that when he says it cannot be helped, he is evading the question; that it is his business to "help" wherever anything is conceded to be wrong. When he awakened to the fact that the long shift inevitably caused a deterioration in the human force, he could not, if he was a real engineer, consent that there was no correction. The thing was wasteful, from the point of view of production, as well as inhuman--wasteful, he saw, because inhuman. It was something, he came to feel finally, that was working as much against the

quantity and quality of his product as against the family, society, and industrial good-will. Would an engineer, he asked himself, who suspected that a certain strain on his metal was too great for that metal to resist permanently, allow its continuance? If he was any kind of an engineer at all, he knew that he would find a way to relieve that strain. He knew, too, that in doing this he must not transfer the strain to other parts of his structure, injuring them thereby. That would be evading, not solving the problem. He must readjust things so that there would be no overstrain at any point.

It is some such line of argument as this that has led many engineers in different industries in this country where the 12-hour shift was prevalent, to tackle the problem of taking what they regarded as a too great strain of the long day off the men, and doing this, not by putting an over-strain on some other factory in the industry but by distributing the strain in such a way that his industry would actually be benefited at every point. Some of the prettiest demonstrations of the possibility of advantageously changing from a two to a three-shift in a continuous process, came from what has been done in our paper mills.

Nearly twenty years ago, a great mill in Maine, and soon after another in Massachusetts, started the ball--not by science, but by the ruling of the authority at the top, moved

purely by humanitarian reasons. These gentlemen had come to believe that a 12-hour day was too long for the good of the men and they went on to three shifts, voluntarily transferring the strain from the men to the other departments of the industry. The head of one of these concerns, who is thoroughly convinced that the change was wise, says that they have never attempted to prove that it was better economically, but they do know that they produce more tons of paper in twenty-four hours with the three shifts than they did with the two, and also that the quality is better. This was not, however, their idea in making the change. They wanted a happier and healthier labor force, and that they claim they have.

Conclusive as this may be to those of us who are convinced that whatever is good for the man is good for the industry, that efficiency automatically follows the well-being of a labor force; it is not, and ought not to be enough for the engineer. It is his business to prove by undeniable figures that the proposition is correct. And in the paper business this has been done.

One of the most able and far seeing of our new order of engineers is Robert Wolff, who for a number of years now has given much of his time to the re-organization of paper and pulp mills, and whose success has come largely, as he can prove,

from changing the long hours to shorter ones, the two shifts to three. At a recent meeting of the Philadelphia Engineers' Club, Mr. Wolff related some of his experiences, illustrating them with diagrams. It would be hard to find a more convincing demonstration of the advantages in a continuous process industry of the 8-hour shift. A manufacturer, who in the face of these demonstrations, still clings to the long day has either some kind of a blind spot in his brain--the kind of thing which we usually call stupidity, or else is afflicted with that hopeless disease, known as inherent obstinacy.

Take this bit of experience, covering seven years. The mill was an old one, its equipment poor. It was producing 42,000 tons of paper per year, with a force of 336 tour workers; i.e., the men on 12-hour shifts, and 200 day workers, whose hours were those of the section for day work. The mill was put on three shifts. The pay for eight hours remained the same as it had been for twelve hours. It was necessary to add 119 men, in order to carry out this plan. This is a point to note because it is often claimed by the school of "It can't be done" that the change from 12 to 8 hours always requires at least 50% more workers. As you will see, the percentage here--the whole force of 536 men being considered--was only 22.2%. And what happened?

Under the new order of three shifts, the production was soon sufficient to offset the increased price per ton caused by the greater labor cost, and at the end of seven years of this experience, the production was nearly three times what it was at the start, raised from 42,000 to 111 tons; and this had been done without adding a single piece to the equipment. And Mr. Wolff points out that another and most thing in an industry results from this change, and that is, that this mill, from making the poorest pulp in the world--I think that is what he said--is now making the very best. European competition in pulp had kept this mill often out of the market, purely because of quality. The tables have been turned, and the mill is making now as good, if not better pulp than anything that comes in from the other side.

And how does he explain this? Why, in the most natural way for those who are willing to consider men and the laws that govern their processes. Under the old long day, they had always been tired out, their minds always dull and inattentive, they slept at their machines--the commonest thing in a mill on a long shift--they didn't care whether things were going right or not--nor would you. Under the change, according to Mr. Wolff, the attitude of the men in this mill has entirely changed. They are mentally alert and keenly interested in the

fact that they have been able to do so fine a thing for their industry, by their tendency to raise the quality of their product until the pulp is actually cleaner, stronger and better in quality than that which is coming in from Europe.

Now, this is but one illustration, and Mr. Wolff gives others of the same nature. Here is one from a small modern plant which he put on the three shifts. Here, because everything was up to date, it was possible to make the change with a considerably smaller percentage of increase in the tour workers than in the case cited above. The percentage of increase was only 12.1%. The tonnage of the mill immediately responded, rising from 70 tons a day on a two-shift basis to an average of 100 tons per day on the three-shift basis. Mechanical improvements had considerable to do with this increase, but the great impetus, so Mr. Wolff claims, both in the quantity and the quality of the output, came from the change to the shorter hours. The man who managed this plant while Mr. Wolff was bringing about the change in the hours, says that there was a pronounced change in the spirit of the organization. He declares that it made the men "wide awake, energetic, on their toes, interested in their work." "On the old basis," he says, "they lacked enthusiasm and had a tendency to neglect things and sleep on the job. Much of the increased production, in my

judgment, comes from the change to the three shift basis."

So much for the change in the paper industry; but this is not the only continuous process industry in the country in which the 8-hour day has been proved productive not only in the quantity and quality of its output, but, more important still, in changing the worker from a dull and indifferent one to an attitude of active, interested coöperation.