

CAN MACHINES MAKE US FREE?—A DEBATE

I — THE WORKER EMANCIPATED

WILLIAM BASSET

WE regard the worker as the slave of the machine, only because we invest him with emotions he does not possess. According to William Basset only one in fifty workers finds repetitive labor irksome. Machines have made the worker's task easier, and by increasing production they have raised his pay. The present day machine tender has the money for necessities and luxuries and the money, time, and energy for pleasures, utterly unknown to the hand workers of a hundred and fifty years ago.

THOSE who are unused to a manufacturing plant often assume that to work day in and day out at a loom, or a drill press, or a steam hammer must be most revolting in its monotony. I have frequently heard callers speak of a factory they were visiting as a hell, although to me it seemed a rather neat, safe, and shipshape place, if perhaps a trifle noisy. It depends upon the point of view.

Much as Dr. Johnson saw in a brewery, not merely a collection of vats and pipes, but "the means of becoming rich beyond the dreams of avarice," so I see in a boiler shop not a hell of noise and hot metal, in which toil the slaves of machines; but rather, the means of freeing thousands of women from the real slavery of carrying coal up countless flights of steps to tens of thousands of stoves. I see not only the more comfortable lives that those boilers will bring; I see in the noisy but light and easy-to-handle riveting hammer a machine which saves a dozen men the back-breaking work of swinging heavy sledges. I see one man do more work with it in eight hours than the dozen would have done in a twelve hour day. I know that while the dozen would have fallen in bed within an hour after the whistle blew, worn out with their efforts, the "slave" of the riveter is fit and ready for a half dozen hours of play. And this slave of a machine has more money to spend and more comforts on which to spend it than had the freeman of the hand hammers. That one picture portrays most of the ways in which machines have set men free from slavish drudgery and have given them command over goods that a king could not have owned in days of handwork and craftsmanship.

Let us see first how the workers themselves feel about the machines of which they are supposed to be the slaves. On your next journey, ask the locomotive engineer if he wishes to throw off his gyves and become the free and picturesque driver of a stage coach. You will find that he, strangely enough, considers himself the master of his machine, and that he loves it as it is proper that a master should love a good servant. The machine demands minute and constant care, it is true, but he prides himself on the technical knowledge and manual dexterity that fit him to care for it.

I once took a snapshot of a small, stationary steam engine used for certain auxiliaries in a factory. A workman whose duty, day in and day out, was to oil the bearings of the engine, and otherwise nurse it, asked for a print of the picture, and, so that I might know where to send it, presented me with his card. It read "Moses Washington, Engineer." He was most unskilled, — wages \$3 a day, — a slave to his machine if anyone ever is, but he didn't know it. In fact, he was inordinately proud of his exalted position in life and of his self-conferred title. But is such a man a slave to his machine? You may think so, but what would be his status if he were not at the machine? He would be a slave to the shovel and pick, or to cows on a farm, where the physical effort demanded of him would be much greater and where less of his time would be free. Because the machine has been given the intelligence the worker lacks, he is able to do better work with it than he could do without it. Being more useful than formerly, he is paid more for less irksome work. I know of a concern which uses highly ingenious automatic machines to wrap, label, and pack its product. Formerly, 450 girls were required to perform these operations by hand. On piece work they averaged \$17 a week each. Now fifteen machines, each tended by one girl, do the same work, and each girl gets \$27 a week. The machines do the work more neatly and more sanitarily, and the girls who tend them exert less effort and suffer less fatigue. They have to be unremitting in their attendance on the machines, — but they had to be constantly at work before the machines came in, or they would have made but small earnings. In that way they are slaves; but then is not everyone who works at anything the slave of his job? Certainly the slavery of these girls is now less fatiguing and otherwise more

pleasant than before. They take pride in their ability to operate the complicated machines, and each one feels that the machine is *her* slave.

I could cite hundreds of cases where machines, in displacing hand work, have resulted in less fatigue and greater earnings to the worker, increased production, and lower prices to the consumer. To the uninformed observer a rapidly moving machine may seem to demand a killing pace from its attendant, but actually it practically never does. In the first place an intelligent manufacturer knows, — and the others soon find out, — that a speed which fatigues the worker produces a lower output in a day than does a slower pace. It is not altruism that leads engineers to study operations in order to find easier and less fatiguing ways to do work. It is because they realize that the easier the work, the greater the production. Frequently I have seen the daily production of a man and his machine increased twenty per cent by reducing the speed ten per cent.

Sometimes, on the other hand, it is easier to work rapidly than slowly. Take for example the operation of making aluminum caps for fruit jars. The girls who sat all day long feeding strips of aluminum into the punch press complained of fatigue. A study showed that the rhythm of their motions was frequently interrupted by a piece of metal sticking in the die and having to be pried out before the machine could be started again. We know that rapid repetitive movements can be maintained for long periods if the rhythm of the movements is well marked and uninterrupted. A study of this operation showed that at a speed about fifteen per cent above the customary, the metal ceased to stick. This made the girls perform their motions more rapidly, but it stopped the interruptions. The girls liked the new speed better, for with the rhythm unbroken it tired them less. As one said, "It somehow makes me feel as though I were dancing, for I hum a tune in time with my motions."

I have yet to see a machine in any industry that does not make the operation easier for the worker than when the same work was done by hand. The trouble with those who denounce machines is two-fold. The machine impresses them as sort of noisy, inhuman, — an inexorable devil that would as soon eat the flesh of the worker as the metal it is fed. They do not understand the machine and

they seem to feel that the worker fears it as much as does the uninformed uplifter who is doing the pitying. Second, these pityers and critics do not know how those operations were performed before the horrid machine came into being. Therefore, they cannot see that the machine attendant is either of a low grade mentality, one who without the machine could not make a living, or is a far higher type than was the man who formerly did the work by hand.

This was strikingly but unintentionally demonstrated at a textile exhibition where, side by side, were shown in operation the old hand loom and the modern Jacquard loom. The old weaver on the hand loom is thought of as a craftsman, while the modern weaver is pitied as merely an attendant to a machine. Yet the principal difference between a hand loom and a power loom is that one used man power while the other uses mechanical power. The old time weaver operated the loom harness with a treadle and threw the shuttle by hand. He was merely an inefficient power plant, and looked about as happy and inspired when he worked his hands and feet as does the plug horse in a tread mill. The Jacquard loom is a complicated — almost intelligent — piece of machinery that requires expert attention from its operator. The slaves of this machine are white collar men, — alert, intelligent, and not to be told by their looks from the engineer who supervises the building of a Panama Canal or a monster bridge.

With no exceptions, that I have seen, the application of power and machines to operations that formerly were done by hand decreases the fatigue of the worker and increases his earnings. Often it improves him mentally and, by relieving him of drudgery, actually makes him more of a craftsman than he was in the days of hand work. For a great deal of hand work was not skill, but muscle; the hand worker was more a maker of power than of art.

Criticism of machine industry is often based on the fact that the modern worker seldom performs all of the operations on a product. Subdivision of operations is presumed to result in distasteful monotony that brings with it untold mental misery to the workers. One psychopathologist thinks he sees in violent revolutionary outbreaks and in suicidal mania an unconscious

reaction to monotony. Repetitive motions are supposed to inhibit the urge of craftsmanship.

I have asked many workers of both sexes who perform simple motions on highly repetitive and subdivided operations if the monotony were distasteful. Many missed the meaning of my question, for they could not understand how monotony could be other than pleasant. They liked the work which they could do automatically. It required no mental effort, and so left them free to think their own natural thoughts. My observation indicates that only about one factory worker in fifty objects to repetitive operations. Occasionally we find a worker with unusual skill and pride in craftsmanship who rebels at the monotony of machine work. But, in the main, workers are interested solely in earning as much money as possible. Few of them have pride in achievement, ambition to rise in authority, or willingness to assume responsibility. If a machine can be introduced to do a job better than it can be done by hand, they willingly become machine operators, — provided that it means more money to them. The wise manufacturer who installs machines sets a rate so that wages *will* be greater, taking his saving in the lower cost per unit that results from the greatly increased production.

I want to emphasize the fact that in my wide experience with workers in many industries I have never known labor troubles to arise from the workers' objections to the monotony of repetitive work. Nor have I ever heard a worker refer to himself as "the slave of a machine." Nine times out of ten the spontaneous dissatisfaction of workers has to do with wages.

We have seen then that the condition of a worker at a machine is not slavery, either actually or in his opinion; that, on the contrary, the machine has given him higher wages for shorter hours of easier work.

It hardly seems necessary to point out that when he comes to spend his higher wages machines emancipate him still further. There is plenty of evidence to show that in the last three centuries, and in the last 150 years especially, the absolute price of manufactured products has fallen. Pepys, writing in the middle of the 17th century, tells of the prices of clothes, textiles, books, furniture, and silver plate far higher than the prices of better goods today. The real wages of the workers and of the farmers were far

lower then than now, and they did not rise materially until machines were invented which would perform an operation in a hundredth or a thousandth of the time required by hand work.

Cynics profess to doubt whether the availability of larger quantities and new kinds of consumers' goods, made possible by machine production, actually increases the happiness or welfare of mankind. They condemn the moving pictures as low-browed amusement, the cheap automobile as a nuisance, the talking machine as canned music, and newspapers as trash. But the fact remains that the workers find amusement and happiness in all of these things. Four or five days' labor will buy a good looking suit of machine-made clothes which a century ago would have cost two months' wages. A comfortable and serviceable pair of shoes costs but a couple of days' labor as against a week's labor before machines displaced the cobbler. A shirt, pleasing to the sight and skin, costs but an hour's wage. A coarser, less sightly shirt, would have taken days of a hand worker's time to make or to buy.

Since machinery came in it has been the fashion to depreciate present-day quality and to exaggerate the quality of things handmade. Admittedly, much of the output of our machines is inferior. We see few cheaply made examples of antique handicraft, for the good reason that the shoddy products wore out long ago. But there was much poorly made stuff then as now. A machine will joint furniture better and give it a more beautiful finish than can the most painstaking craftsman. Antique furniture is clumsy, some of it is rickety in construction, and the beautiful finish is far more the result of age than of craftsmanship. Antique furniture, fabrics, pottery, or armor are rarely well made, well finished, or even beautiful, according to modern standards. Our looms to-day produce more beautiful, finer, and better lasting fabrics than ever came from the hand loom.

The artistic ability is no longer in the operator at the loom, but in the artist's studio where the designs are drawn. A textile designer is no less an artist because he does not know how to throw a shuttle by hand. The furniture designer is no less an artist because he works with pencil and paper instead of with chisel and saw. Machine-made products are often of higher artistic value than the hand-made. Machine production has reduced the cost of

common things to a point where thousands can buy them who could not if they were made by hand. New conveniences are available that could never be made by hand. The machine has been the biggest factor in increasing the real wages of all men a hundred fold. And machines have given well paid employment to people of low grade mentality who would in other days have lived the lives of brutes.

II—INDUSTRIAL DEMOCRACY A DELUSION

ERNST JONSON

MECHANICAL invention has not freed man from economic bondage. Modern industry is neither free, nor just, nor generous. It deprives the worker of the essential security of assured employment by placing him at the mercy of his employer. But Ernst Jonson does not regard the democratization of industry as the solution of the worker's problem; indeed, he regards it as an ideal impossible of realization. The Few must always lead, control, and govern the Many. But the Few must learn to govern well, — unselfishly and humanely.

IN his article, Mr. William R. Basset endeavors to show that through mechanical invention man has freed himself from economic bondage. If this be so, whence this ceaseless unrest, these hate-filled, bloody conflicts that besmirch the pages of modern history? To me it seems rather as if mechanical industry were merely a preliminary step toward freedom, and that another, a greater and more radical step remains.

Unquestionably the introduction of the machine tool into industry has resulted in the most rapid advance in industrial efficiency and average wealth that the world has ever seen. Yet the economic situation is not a happy one. Indeed, in some respects it falls short of past achievement. It seems as if, somehow, the evolution of the economic structure as a whole had not kept pace with the development of the processes of production. Modern industry is not free, it is not just, it is not generous. It condemns millions to indifferent mechanical employment, without hope of change, even without assured livelihood. The worker looks for some enduring reward of his endeavors, such as the Guildsmen enjoyed, and is disappointed; not success, not respect-