



The

# **PROMISE OF AUTOMATION**

and

## **HOW TO REALIZE IT**

**By HYMAN LUMER**

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## ABOUT THE AUTHOR

Brooklyn-born DR. HYMAN LUMER has lived in Cleveland since 1917, attending Western Reserve University where he earned his Ph.D in 1935. He taught biology at Western Reserve and at Fenn College, heading the Biology Department at the latter until 1947. For a number of years, up until the outbreak of the war in Korea, in 1950, he was the Educational Director of United Electrical Workers Union, District 7, comprising Ohio and Kentucky. He is the author of *War Economy and Crisis*, published in 1954, and *The Professional Informer*, published in 1955. In addition to this pamphlet, he has written and lectured extensively on the problem of automation.

# THE PROMISE OF AUTOMATION

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## *this is automation*

*"At the Ford Motor Company's Cleveland plant, rough engine blocks enter an assembly line and go through 530 automatic operations, emerging 14.6 minutes later as finished engines. Automatic machine tools regulate themselves as they drill, hone, bore and mill . . .*

*"There are precision tools which grind bearings to microscopic measurements, and then test them. Those emerging a whisper off-size are rejected and the machine proceeds to fix what's wrong with itself. The Bell Telephone Laboratories have developed a system which records billing data for all calls, assigns them to the correct subscribers, times calls, computes the cost and prints information for billing." (John Diebold, "Automation—Will It Steal Your Job?", *This Week*, June 26, 1955.)*

This is automation. Or rather, these are a few samples of the amazing new productive techniques everyone is talking about these days.

These developments have led to a flood of predictions of a new era of pushbutton factories, an end to human drudgery, an abundant life for all. "If properly understood, applied, developed and controlled," says Professor Walter S. Buckingham of Georgia Tech, "automation, together with atomic energy, may provide means for eliminating poverty for the first time in the history of the world."

In contrast to this, organized labor sees in automation the threat, as more and more jobs are eliminated by it, of growing unemployment, economic hardship and depression.

Where does the truth lie? Is automation a blessing or a curse? And how can it be utilized for the greatest benefit of the working people?

### ***something new has been added***

Some say there is nothing really new about automation, that it is just a continuation of the process of mechanization, or replacement of human labor by machines, which has been going on for a long time.

This is not so. That automation replaces manpower with machinery is true as far as it goes, but it doesn't go far enough. For something radically new is involved—the self-regulation of highly complex productive processes. As defined in a CIO report on automation, “it represents the use of mechanical and electrical devices rather than human workers, to regulate and control the operation of machines.”

Its basic feature is the use of feed-back control, or automatic self-correction. A simple form of such control is the furnace thermostat, which regulates temperature by automatically shutting off the supply of heat when the temperature goes above a specified level and keeping it shut off until the temperature drops back to that level.

Automation involves the use of extremely intricate feed-back devices. And this may be coupled with complex mechanization, or the joining together of many machines into one single unit, with appropriate mechanical devices for automatic loading, unloading and transfer of material from one set of operations to the next. This gives rise to the

automatic production line and, by hooking these together, ultimately to the automatic factory.

Automation is therefore a new stage in the process of mechanization, one which does indeed hold forth tremendous possibilities of eliminating manual drudgery and producing an undreamed-of wealth of goods with far less toil than today. It is truly a development with profound economic, social and political consequences. Yet the workers' fears as to its evil consequences are by no means unfounded.

### ***automation and jobs***

To be sure, automation, like earlier forms of mechanization, serves to eliminate workers. But it does so in a different way. Hitherto, the introduction of machinery has operated to replace skilled craftsmen by semi-skilled or unskilled machine operators and materials handlers. Automation goes further. "The jobs that are 'duck soup' for elimination by automatic production," writes *Factory Management and Maintenance Magazine*, "are mainly the semi-skilled ones, such as machine operations and materials handling. Some observers believe that the factory of the future will go so far as to wipe out this great 'middle class' of industry."

The elimination of such workers through automation is sometimes truly phenomenal. One observer describes a modern oil refinery as "a bewildering kind of factory" in which "a few lonely men wander about . . . doing supervisory or maintenance tasks here and there." Another tells of roaming about the machinery in the automated block line of the Ford Dearborn plant for five minutes before encountering a worker. An automatic piston factory in the Soviet Union turns out 3,000-3,500 pistons a day with five workers per shift. In the Raytheon radio

plant, an automatic line turns out 1,000 radios a day with two workers. And so on.

In the face of this, Big Business spokesmen insist that far from giving rise to mass unemployment, automation will in the long run produce more jobs, not less, and these will be easier, better-paying and more satisfying. Of course, there may be layoffs and dislocations as automation is introduced. But these, they maintain, will only be temporary adjustments—the necessary price of progress.

These rosy predictions, however, are belied by reality. Increased productivity is not being matched by a corresponding increase in jobs. In the chemical industry, output has risen over 50% since 1947, but the number of production workers only 1.3%. In the electrical industry, increased output since 1953 has been accompanied by a 13% drop in the number of production workers. Steel and auto production are achieving new records with less workers than before.

To a considerable degree, these effects have been covered up by the present over-all expansion of industrial production. But not entirely. Thus, according to Census Bureau figures, in October, 1953 there were 1,162,000 unemployed. In April, 1955, with a higher peak of production, the number had grown to 3,176,000. Clearly, even a mild economic slump would soon bring about a sharp drop in the number of jobs. There are few workers today who are not keenly aware of this.

### ***“labor-saving” — for whom?***

Anything which reduces human toil should be regarded as a social blessing. Yet the development of automation, which promises unequalled relief from manual drudgery, gives rise among working people mainly to fear of mass unemployment and poverty. Why this contradiction?

It arises because automation is being introduced in a capitalist system of production, because it is being developed by giant monopolies for their own economic benefit, not for that of society as a whole.

When an employer introduces a labor-saving device of any kind, he does it not to make the job easier for his employees, but to reduce his wage bill and thereby to increase his profits. His aim is to get rid of as many workers as possible, while compelling those who remain to work as hard as before and for as little money. A letter recently circulated by General Electric admits as much. It says "the employer must automate to stay alive . . . it is imperative that he remove from his payroll any substantial surplus of employees."

The worker, therefore, does not automatically benefit from technological improvements. On the contrary, their effect is to decrease the share of the product of his labor that goes to him and to increase the share that goes to the employer. It is to eliminate jobs and throw growing numbers out of work or into lower-paying jobs elsewhere.

"But," the economists argue, "the displacement of workers by new machinery is only temporary. Before long, new jobs become available in the industries making the machinery. Furthermore, the increased productivity makes it possible to sell the products more cheaply and to expand the market, thus creating more new jobs. Just look at the automobile industry. The introduction of labor-saving, mass-production techniques brought the price of automobiles down to a point which made possible the sale of millions of cars and built a new industry employing hundreds of thousands of workers. Automation will do the same thing on an even bigger scale."

This argument may sound good, but it is false. To be profitable to the capitalist, the new machinery must cost

less than the wages he saves by using it. In other words, *less* jobs are created than are wiped out. By the same token, the number of jobs in new industries, themselves highly mechanized, is bound to be less than the number eliminated in other industries.

This is especially true of automation, where the production of automation equipment is itself becoming highly automated. For example, a GE automation equipment plant has been opened in Waynesboro, Va., which will employ 500-600 workers. Obviously, the products of this one plant will replace many times that number of workers.

Automation is resorted to largely to offset the growing strength of labor and the demands for higher wages. John I. Snyder, president of U. S. Industries, says "machines are easier to control than people . . . The more machines the fewer people, and therefore the easier the control problem."

As for the argument that increased productivity leads to lower prices, it is enough to point out that today, with productivity rising faster than ever, consumer prices are not getting any lower. But corporate profits are establishing new all-time records.

### ***skilled jobs for all?***

Among the glowing predictions made for automation is that it will vastly increase the opportunities for high-paying skilled jobs. The average American worker, we are told, will become a skilled worker, doing more satisfying work and earning more money. In fact, says Lieut. General Leslie Groves, "freeing people from drudgery and tedium and providing an opportunity for them to hold skilled jobs and perform more interesting tasks" outweighs any disadvantage to labor from automation.

This is, of course, directly contrary to the effects of

mechanization in the past. Hitherto it has operated to replace the more skilled jobs by less skilled ones paying lower wages. With the growth of mass-production techniques, the role of skilled labor has declined. In the average American factory today, only about 5% of the production workers are skilled journeymen.

Moreover, there has been a trend toward degradation of skilled crafts. A craft may be broken down into specialized subdivisions, each demanding less skill than the craft as a whole. Or parts of several crafts may be combined into a single job. In the installation and maintenance of complex machinery, the employer finds it cheaper, instead of having a millwright do part of a job, a machine repairman a second and an electrician a third, to hire or train one worker to do just enough of each to take care of the particular machinery.

At first glance, automation appears to reverse these trends. Not only does it replace semi-skilled workers with automatic control devices, but the extreme complexity of the equipment necessitates the employment of a much greater number of maintenance workers. As a result the proportion of skilled workers increases.

In the Ford Engine Plant No. 1 in Cleveland, maintenance workers make up nearly 21% of the work force. Of these, four out of five, or over 16% of the work force, are skilled journeymen. Automation in this plant is far from complete; it does not yet include engine assembly, which involves a large number of workers. With complete automation, it is estimated, maintenance personnel would equal or exceed the number of workers on the production lines.

It would appear, therefore, that automation does indeed create a greatly increased demand for skilled workers. But this is only part of the story.

## ***automation no exception***

With automation, the process of degradation of skilled crafts is considerably accelerated. A UAW report on automation states:

"Automation has also been seized on by management, in some cases, as an excuse to attempt to break down the lines of demarcation between the skilled trades by attempting to pressure the men in one trade to do the work of those in other trades. The complexity of automation equipment, requiring as it does the services of many of the trades, is the smoke screen behind which management hides these efforts . . . . If successful, such a drive to reduce the number of journeymen employed, by overlapping in the skilled trade classifications, would inevitably undermine the basic skills so that our economy would be left only with men who are jacks-of-all-trades and masters of none."

This pressure is accentuated by the need to reduce down time to the utmost. As automation increases, the plant takes on more and more the character of one big machine, with the breakdown of any one part bringing the whole works to a stop. Hence, when a breakdown occurs, nothing is spared to get it fixed in the shortest possible time. Every available worker is used. Maintenance men are almost literally thrown at the job. This, of course, generates tremendous pressure to cross lines and combine crafts.

But this is not all. It is much cheaper to replace skilled journeymen with less skilled workers, trained by the company itself, to handle the maintenance and repair of particular pieces of equipment.

Where labor is well organized, this is vigorously resisted. But in semi-rural areas where labor organization is comparatively weak, employers have a relatively free hand in hiring and training young workers at scales far below those

of journeymen. Undoubtedly, this is an important reason for the widespread practice of building new automated plants in such areas.

In some cases skilled workers, such as machinists, may be directly displaced by automatic machines. Associated Press staff writer Sterling F. Green describes one example thus: "You see him (automation) recording on tape the movements of a skilled worker as he shapes metal on a machine. When the tape is fed back, the machine produces the same movements over and over—minus the workman."

In any event, it is clear that the tendency is not to elevate every worker to the level of a skilled craftsman, but rather to degrade skilled labor to the level of semi-skilled at a faster pace than ever before.

### ***downgrading and layoffs***

The over-all effect of automation is to reduce drastically the amount of *direct* labor required, and to increase the proportion of *indirect* labor. This means a proportionate increase not only of maintenance workers, but also of workers in materials handling, sweeping, transport, shipping, and similar fields.

What becomes of the semi-skilled workers displaced by automation? Obviously, they do not move into the skilled maintenance jobs. Some of them become automation equipment operators. But most are forced into the lower-paying indirect labor classifications. And even such jobs become reduced in number since, along with automation of production lines, elaborate conveyor systems are frequently installed to transport material and feed the lines.

At the end of the chain are the many workers who are forced out altogether, and have to seek jobs elsewhere. Growing numbers are pushed out of factory jobs and into

service jobs, often lower-paying. Especially hard-hit are Negro and Puerto Rican workers, who generally have least seniority and training, and who are rigidly excluded from the skilled crafts.

### ***new forms of speedup***

By eliminating manual labor, automation presumably makes work easier and does away with physical fatigue. The operator has nothing to do but watch lights and dials, push a few buttons and occasionally change a tool. No more physical strain, no more speedup. At least, so it is said.

But automation does not do away with the drive to squeeze the greatest possible profit out of production, and hence, to squeeze the maximum output out of each worker. Speedup and fatigue are by no means abolished; they only take new forms.

Although the automation equipment operator is relieved of physical labor, the task of keeping an eye on a multitude of instrument panel lights and watching for faulty performance of tools and machines is one which can be stepped up to the point where it becomes as nerve-racking and exhausting as physical work. And this is exactly what happens, as a recent Yale University study shows:

*"Mental tension is supplanting muscular fatigue as the chief complaint of workers in newly-automated factories, social scientists were told today.*

*"The new machines have eliminated drudgery but the strain of watching and controlling them makes workers 'jumpy', according to a study by Yale University.*

*"Jobs are physically easier, but the worker takes home*

worries instead of an aching back. . . ." (New York Times, December 27, 1955.)

At Dearborn, Stanley Tylak, aged 61 and for 27 years a Ford production worker, told a *Chicago Sun-Times* reporter: "The machine has some 80 drills—and 22 engine blocks going through. You got to watch. It's hard on your mind." The strain eventually led him to quit and take a lower-paying job elsewhere.

In addition to this, as operators become somewhat accustomed to the strain, they are given added tasks. Thus, speedup takes the form also of added burdens of other work, presumably on the argument that the operators may as well be doing other things while they are watching.

Speedup is further intensified in connection with breakdowns. Here the demand for haste becomes so great that workers are driven at top pace, safety standards go out the window and the danger of serious accidents is greatly increased. Finally, the high speed of production on automated lines leads to speedup of the non-automated operations which come before and after.

### ***"measured day work"***

Since output no longer hinges on the speed of individual machine operators, automation leads to abolition of incentive systems. It also leads, as we have seen, to a considerable rise in the proportion of non-production workers, who have generally been paid day rates. Consequently, employers have turned their attention more and more to cutting production costs in this area. A number of companies have already begun to time these day-rated jobs, with the aim of setting work standards for them and instituting "measured day work."

The most notorious example is Westinghouse, where

this became the central issue in the recent hard-fought strike. *Fortune* (December, 1955) referred to this as "the first 'automation' strike," saying: "The I.U.E. strike against Westinghouse . . . may go into the record books as the first strike on 'automation-type' issues in industrial history. *Similar issues may confront every major corporation in the country in the next few years.*" (Emphasis mine. H. L.)

In short, speedup techniques are now being extended to maintenance men, materials handlers, storeroom attendants and other classifications not previously affected. What then, becomes of the glowing promises of more, easier, better-paying and more satisfying jobs as a result of automation? Obviously, nothing. The fight against speedup is not ended; rather, it must become sharper as automation spreads.

### ***pushbutton era?***

The more enthusiastic prophets of automation are heralding the approach of a new era of pushbutton factories, which almost operate themselves. Is such an era possible?

Technically, it is by no means a science-fiction dream. Automatic factories already exist, for example in the oil refining industry. At Rockford, Illinois, a fully-automated plant turns out 78-pound artillery shells from 12-foot steel bars untouched by human hands. And in the Soviet Union's automatic piston factory, the entire process of manufacture has been automated, from the melting and pouring of the metal to the packaging of the finished product.

Nor is the scope of automation rigidly limited. True, it is most readily applied to "continuous-flow" processes, and has been most widely developed for this type of pro-

duction. However, human ingenuity has shown itself capable of converting other processes to continuous-flow production, and even of modifying the products to make this possible.

There is no doubt that automation can be extended to every major industry. Yet its development in this country has been highly uneven and erratic, with extensive areas of industrial production still virtually untouched by it. For this, the main reason is not technological but economic. For automation is developing in the era of monopoly capital, when the economy is increasingly dominated by giant trusts which eliminate competition and restrict production to keep prices up.

These monopolies are often able, as it suits their interests, to retard the introduction of new techniques. The suppression of patents by monopolies is nothing new, nor is the clinging to outmoded methods of production to protect the investments in them (something the monopolies can do because of their ability to prevent the introduction of new methods by competitors). These factors limit the development of automation.

Today it is largely confined to cases in which the federal government can be made to bear much of the cost through fast tax write-offs, or to military production, where the government often foots the bill and profits are guaranteed.

It is particularly rapid in an industry like auto, where an intense struggle for supremacy among the biggest corporations is in progress, and where the slogan "Automate or Die" becomes especially urgent. Even here, it is limited mainly to production of those parts (engine blocks, pistons, etc.) which change little from model to model. In the steel industry, on the other hand, automation has made relatively little progress. The most rapid automation is taking place in office work, where there is no existing large

investment to be wiped out, and where it does not lead to increased output to be disposed of.

The growth of automation is highly uneven within individual industries, since it is the biggest and wealthiest corporation which can best afford the huge expense involved. The smaller companies are therefore placed at an increasing disadvantage, having to compete against automated plants with their older, less efficient equipment.

To do so, they resort to greater speedup, wage-cutting and worsening of working conditions generally (as in Studebaker and Willys, where wage cuts were pushed on the workers "to keep the company in business"). Thus, the development of automation in some parts of an industry leads to greater exploitation of the workers in the rest.

Finally, automation is restricted by the general instability of the economy and the uncertainty of the future. There are few who today really believe that the current boom will hold up indefinitely, and that the threat of serious depression does not exist.

## ***automation and crisis***

Hanging over the heads of the American people like a Damocles' sword is the threat of a new economic crisis. The farmers are already suffering from a persistent agricultural crisis. And workers in industry are plagued by a harrowing sense of insecurity.

In fact, as this is written, the auto and farm equipment industries show signs of an alarming decline. Car sales in the spring of 1956 have fallen 20% below 1955, and farm equipment sales 50-80%. As of May, 1956, close to 200,000 workers in these and related industries were jobless, and layoffs and short work weeks were spreading.

The workers' fears are magnified by the spread of auto-

mation, and with good reason. For on all sides production increases are taking place with relatively fewer workers, and this is to a growing extent though automation is still in its infancy.

The boom and bust cycle, with its periodic crises of overproduction, has been a feature of the American economy ever since the first such crisis occurred in 1819. Their root cause lies in the gap between expanding productive capacity and the restricted purchasing power of the working people—a gap which exists because our industrial machine is owned by capitalists who demand a share of what is produced, in the form of profits, as the condition for letting production take place at all. If the profits are not forthcoming, the factories are closed down, no matter how much the workers may need the products or how willing they may be to work to produce them.

The drive for profits leads the capitalists to expand production as if the market were unlimited; at the same time, it leads them to keep the wages and purchasing power of the workers, who in the end must provide the market, at the lowest possible level. This is why, every so often, goods pile up which cannot be sold, factories are closed and people thrown out of work. Crises of overproduction are thus a result of the profit system itself, and must continue to occur as long as this system exists.

Technological improvements, as we have seen, serve to reduce the worker's share in his product, and thus to widen the gap between production and the market.

Automation, with its tremendous expansion of productivity, threatens to displace workers and to widen the gap between productive capacity and mass purchasing power to a vastly greater degree than ever before. It therefore greatly intensifies the menace of economic crisis. Indeed, the full development of automation, coupled with the

successful harnessing of atomic energy, would create prospects of such a degree of unemployment as to be utterly devastating.

### ***a program for labor***

If automation leads to worsening conditions for workers, this is because its benefits are taken by the capitalists for themselves in the form of higher profits. The workers can offset this, and can win improvements for themselves, only to the extent that they fight to wrest these from the employers.

Labor must therefore unite in support of a program to combat both the immediate abuses and the long-term dangers arising from automation. Such programs are now being put forward by various sections of organized labor. These include the following demands:

1. Substantial wage increases for all workers, plus tax reductions, a \$1.25 minimum wage and other measures to increase purchasing power.

2. Guaranteed annual wage and severance pay plans to minimize disruption and layoffs, and to provide necessary security against prolonged unemployment.

3. A shorter work week to counteract the elimination of jobs and lessen the threat of unemployment.

4. Immediate revision of job classifications and rates as automation is installed, with higher pay for automated jobs.

5. Broadening of seniority groupings plus preferential hiring, to give the widest possible job protection.

6. Retraining of workers at company expense in new skills required by automation.

7. A stepped-up fight against speedup in all its forms.

8. Legislation to permit older workers displaced by automation to retire on social security pensions at an earlier age.

9. Relocation allowances to help displaced workers and their families move to locations where new plants are being built.

10. Aid to small business and to communities threatened with closing down of plants.

11. Curb of monopoly price fixing.

12. Protection against the runaway shop evil; repeal of anti-labor laws.

To this extensive program may be added the need to fight for a peacetime economy, with expansion of health, social and educational facilities, and for increased trade with the socialist world to provide added markets for the expanded output made possible by automation.

In addition, consideration must be given to the growing plight of small business, which monopoly control of automation is placing at an ever greater disadvantage. Steps are needed to lessen the stranglehold of the big trusts, and to make automation processes and equipment more widely available, perhaps through such measures as government ownership and control of patents.

Struggles on the issues raised by automation are already taking place, not only here but abroad. Only recently, a strike of 2,600 workers occurred in a British plant undergoing automation, for measures to protect them against the resulting layoffs and downgrading.

### *the thirty-hour week*

Of key importance is the fight for the shorter work week—more precisely, for the thirty-hour week with forty hours' pay. Over the years, shorter hours has been among the most burning demands of organized labor. Many of the bloodiest battles in the history of American labor have been fought over this issue, culminating in the great movement for the eight-hour day, which was finally won with

the establishment of the forty-hour week in the New Deal days.

Workers have been compelled to fight for shorter hours not only because employers have tried to squeeze out more profits by lengthening the workday, but also in order to lighten the burden of labor and to protect their jobs as technological improvements made it possible to produce more with less work. Today, the unparalleled reduction of labor made possible through automation alone makes a sharp reduction of the work week an absolute necessity.

Increasingly, workers are coming to realize this. Thus, a resolution adopted by Cleveland Ford Local 1250 of the UAW states: "To the many that are being replaced by automation and to the many more that will be, the thirty hour week with forty hours pay offers a solution. The executive board realizes that thirty for forty is not a cure all, but will go a long way toward solving the problem of automation."

On all sides, the demand for 30-40 is spreading. In the UAW, Walter Reuther has placed the shorter work week as the next major demand. What is needed now is to translate these demands into action, into concrete proposals in contract negotiations.

### ***automation and socialism***

Undoubtedly, the program presented above is one which will go a long way toward improving the lot of the workers. But it is not enough.

It is truly a curious contradiction that the greater the abundance workers are able to produce, the less of this abundance they are able to secure for themselves. This contradiction arises from the fact that the means of production are privately owned and are operated solely for the enrichment of their owners.

It is this which leads to poverty in the midst of abundance and to periodic breakdowns of the economy. This is why, in the richest country in the world, and with industrial production at an all-time peak, there is such a widespread sense of insecurity and fear of the future. And this is why, when it is within man's grasp to produce plenty for all with little labor, this very possibility creates fears of utter economic disaster.

On the other hand, in a socialist society, in which the mines, mills and factories are owned by the people themselves, goods would be produced not to provide profits for wealthy parasites, but for the use of those who do the work. There would be no limit to the market except the needs of the people themselves, and hence there would be no unemployment, no depressions. In such a system automation would truly serve to lighten toil and produce a greater abundance of goods for all.

### ***a living example***

The truth of this is demonstrated by the Soviet Union, where socialism is a reality. Here the introduction of automation is not limited by considerations of private profit, nor is it hamstrung by giant monopolies. On the contrary, it is being developed as swiftly as possible in order to meet the limitless need for increased output. And this development is not uneven and erratic, but planned.

Hence it is no accident that in some respects automation in the U.S.S.R. is more advanced than in the United States, a fact which American observers are beginning to recognize. A commission of American automation experts who recently toured the Soviet Union were profoundly impressed by what they saw. After visiting the Kaganovich ball-bearing plant in Moscow, Nevin L. Bean of the Ford Motor Company said: "I have never seen a better example

