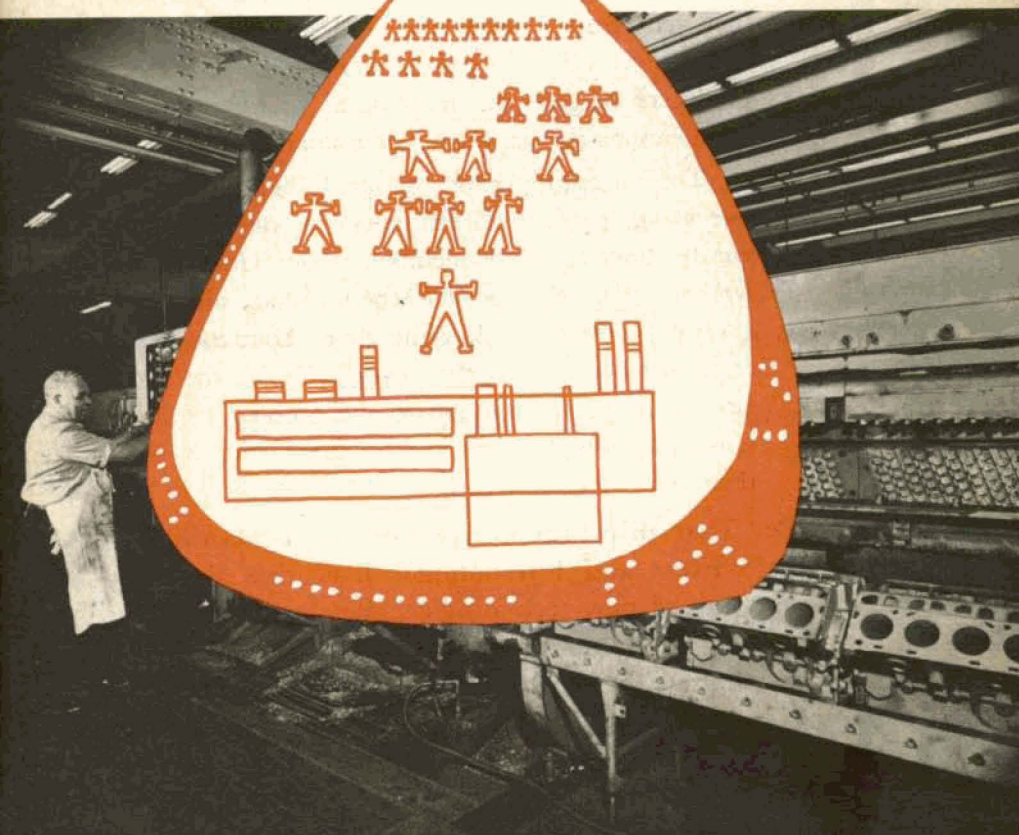
Automation

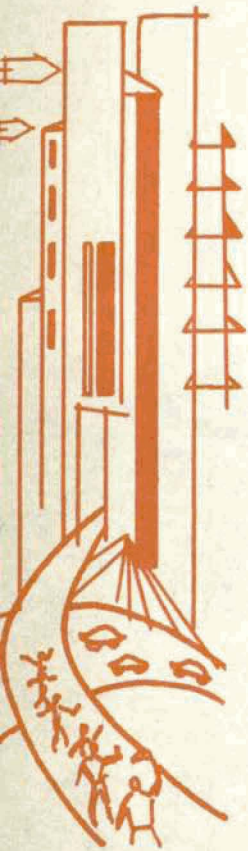
A Report to the UAW-CIO Economic and Collective Bargaining Conference

Held in Detroit, Michigan
the 12th and 13th of November 1954



The Second Industrial Revolution

Resolution adopted by the 14th Constitutional Convention of the International Union, United Automobile, Aircraft, and Agricultural Implement Workers of America (UAW-CIO) held in Atlantic City, New Jersey from the 22nd to the 27th of March, 1953.



WHEREAS: Technological changes now under way in the industries within the jurisdiction of the UAW-CIO may prove to be as revolutionary as the introduction of the assembly line.

Automation, plastic dies, shell molding, extrusion presses and a host of other new developments hold tremendous possibilities for good or evil.

Properly used, they can advance by many years the realization in America of man's age old dream of an economy of abundance.

Improperly used, for narrow and selfish purposes, they can create a social and economic nightmare in which men walk idle and hungry—made obsolete as producers because the mechanical monsters around them cannot replace them as consumers.

The incredibly rapid progress being made in increasing productive efficiency in our industries vitally concerns every member of our Union, every worker, every citizen in America and, ultimately, every man, woman and child throughout the world. It gives more urgency than ever before to the necessity for finding a solution to the problem of maintaining full employment and full production in peace time. Now, therefore be it

RESOLVED: That this 14th Convention of the UAW-CIO instructs the officers and International Executive Board to undertake a study of new technological developments in the industries within our Union's jurisdiction and their implications for the welfare of the membership for the purpose of developing appropriate policies.

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Held in Detroit, Michigan the 12th and 13th of November 1954

With an introduction by

Walter P. Reuther, President, UAW-CIO

A Resolution on Automation

Adopted by the 14th Constitutional Convention of the UAW-CIO

A Glossary of Terms Used In Automation

January, 1955
UAW-CIO EDUCATION DEPARTMENT
Detroit, Michigan

The New Technology

The first industrial revolution had a tragic impact upon the lives of many people. Ruthlessly workers were displaced by the first power-driven machines. They were turned into the streets to wander about homeless and hungry. In desperation the workers struck back at the calloused indifference and social irresponsibilities of the owners of the primitive early power-driven machines. In France, in Germany, and most notably in England, the Luddites, inspired by mythical King Lud, burned factories, wrecked machinery, rioted, and inspired a guerilla war that lasted for almost 20 years.

Out of these early struggles came our modern labor movement.

Now we enter the second phase of the industrial revolution, and the impact of automation—for good or for evil—is magnified a thousand fold. The need for enlightened social policies becomes imperative. Automation must be met sanely and constructively so that the miracle of mass production—and the ever greater economic abundance made possible by automation—can find expression in the lives of people through improved economic security and a fuller share of happiness and human dignity.

Sensibly, rationally, scientifically we intend to harness this radical new force in our lives using its potential to produce an era in which well being, justice, and peace will be the universal possession of all mankind.

Historically the problems of mankind have been set in conflict between people, groups, and nations each engaged in a struggle to divide up economic scarcity. We have had a world divided between the "haves" and the "have-nots"—those who were fed and those who were starving. Now, science and technology have at last given us the tools of economic abundance, and we are confronted no longer with the need to struggle to divide up scarcity.

Economic abundance is now within our grasp if we but have the good sense to use our resources and our technology, fully and effectively, within a framework of economic policies that are morally right and socially responsible.

People and nations have demonstrated the capacity to achieve total dedication in periods of great international conflict. Motivated by common fears and hatreds in times of war, people and nations have made their greatest sacrifices and achieved the fullest measure of common purpose. Now, automation and the new technology, together with the promise of peacetime use of atomic energy, afford us the opportunity to give positive expression to our common hopes, common aspirations and common faith. These new tools of abundance provide us as free people with the opportunity to achieve total dedication in the common task of building a better tomorrow in a world in which people and nations can live at peace, free in spirit, free from tyranny, and free from the pangs of hunger.

The UAW-CIO and its one and one-half million members welcome automation, technological progress, and the promise of the peacetime use of the power of the atom. We offer our cooperation to men and women of good will in all walks of life in a common search for policies and programs within the structure of our free society that will insure that greater tech

nological progress will result in greater human progress. It is in this spirit that we submit this report on automation and its relationship to the guaranteed annual wage for your consideration.

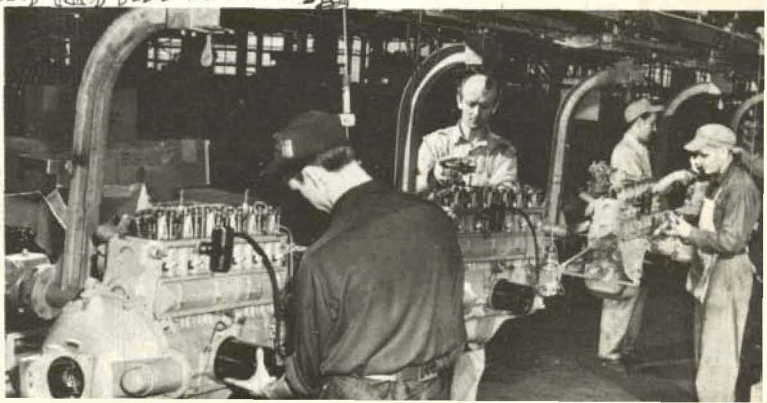
We in the UAW-CIO believe that we can solve the problems of UAW-CIO members as wage earners only as we work with other people in our free society in the common effort to find answers to the problems of all the people in our country—and ultimately in the world, for only as we learn to work with people everywhere in finding answers to the problems of the world community can we find answers to our own. As citizens of the atomic age we have the tools of abundance at our disposal. We are confident that the free people of America, in cooperation with free men everywhere, will demonstrate the good sense and the courage to use the tools of abundance for constructive and moral purposes.

We trust that this first UAW-CIO report on automation will contribute to a better understanding of the problem, the challenge, and the opportunity. This report on the problems of automation was prepared by a special study committee of the UAW-CIO. It was adopted by unanimous action of the UAW-CIO International Economic and Collective Bargaining Conference, composed of delegates representing one and one-half million workers throughout the United States and Canada.

The significance of this report is not in its prose or in its brilliance, but like other Union documents its significance lies in the fact that it demonstrates the ability of people to deal with their problems thoughtfully and rationally through committees, conferences, and congresses—in this instance in an effort to find the answers by which the second phase of the industrial revolution can be harnessed to peaceful and constructive purposes. We in the UAW-CIO are confident that we will not have to fight the new machines and devices. Rather, we will use them to bring health and happiness, security and leisure, and peace and freedom to mankind everyhere.

Walter P. Reuther

Walter P. Reuther, *President*
International Union, UAW-CIO

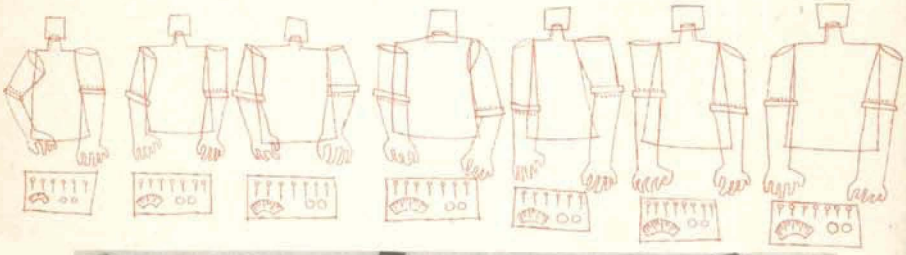


Parable

CIO President Walter Reuther was being shown through the Ford Motor plant in Cleveland recently.

A company official proudly pointed to some new automatically controlled machines and asked Reuther: "How are you going to collect union dues from these guys?"

Reuther replied: "How are you going to get them to buy Fords?"



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A Report to the UAW-CIO Economic and Collective Bargaining Conference November 12, 13, 1954

The dictionary, as yet, does not contain a definition of "automation", but already it is making striking changes in our industrial system. Some management spokesmen say automation is "the automatic handling of parts between progressive production processes"; others claim it is "a new philosophy of design, a new manufacturing method." Regardless of definition, however, technological developments involving the greater use of automatic machinery and the automatic regulation and control of this machinery are giving rise to radical changes in the factory. These changes, sporadic at the outset, are now constantly increasing in velocity and volume. The Republican tax bill changing the basis for the calculation of depreciation may tend to accelerate the scrapping of existing plant and machinery and their replacement with new and more efficient equipment and facilities. The manager of the new Ford foundry in Cleveland gave a graphic idea of the kind of changes which are taking place when he stated.

> **"Ours is the only foundry in the world where the molding sand used to make castings is never touched by human hands except maybe out of curiosity."**

Automation may be the forerunner of a second "industrial revolution" which will have a greater impact throughout the world than the first. Or, technological developments may come more slowly and gradually without causing major changes in economic and political institutions and relations. The experts disagree on what the future holds. One says automation is only

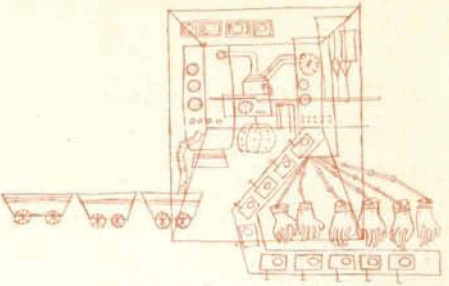
> **". . . a new chapter in the continuing story of man's organization and mechanization of the forces of nature."**

Another says that automation

> **". . . will produce an unemployment situation, in comparison with which . . . the depression of the thirties will seem a pleasant joke."**

A third, who believes that the new electronic computors will be linked with automatic machinery to produce robot machines, believes that

> **". . . we should set up a Robot Machine Commission, with the duty of formulating social policy on the speed and circumstances of the introduction of robot machinery and with power**



Some management spokesmen say automation is "the automatic handling of parts between progressive production processes"; others claim it is "a new philosophy of design, a new manufacturing method."

to speed up or delay its introduction according to what the public welfare demanded."

Already there are examples where relatively few men do the work which formerly was done by many. According to *Newsweek*:

> "Ford's automatic engine plant turns out twice as many engines as an old-style plant, with one-tenth the manpower."

Approximately 10,000 men in the foundry and engine divisions of a major auto company now turn out the same production which formerly required more than 23,000 men. Only a large increase in total output prevented wide-scale layoffs in those divisions.

These developments are not confined to the industries with which the UAW bargains but extend throughout the economy. Newspaper articles revealed that

> ". . . a radio assembly line geared to produce 1,000 radios a day, with only two workers needed to run the line (is replacing) standard hand assembly (which) requires a labor force of 200."

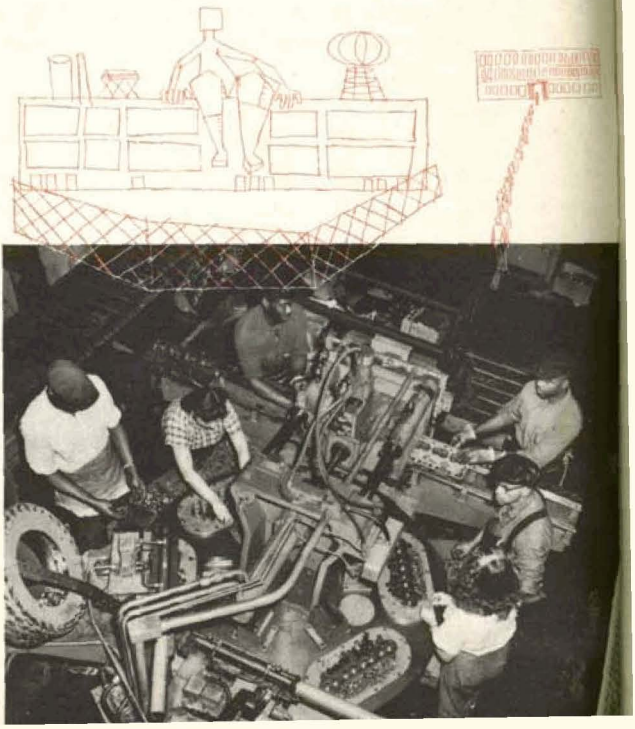
Automatic controls have been widely introduced in the petroleum industry. One industry spokesman stated:

"The average refinery which would employ 800 people without instrumentation would employ 12 people were instrumentation utilized to the fullest extent possible."

A prominent Harvard economist has stated that it would take approximately 600 million dollars to provide the necessary controls and instruments to automate all the plants built in 1950. During that year about one-tenth that sum was spent for that purpose. One indicator of the rate of adoption of automation is the output of the "industrial recording and controlling instruments" industry. In 1951, according to this same economist, the sales of these instruments doubled. And, if the upward trend in expenditures to automate industrial facilities continues, American industry may be fully automated within a decade. This, according to another economist, will mean that one man will do *at least* the work now done by five men. These predictions, if accurate, would mean, for example, that 200,000 men could match the present output of the million UAW members in the automobile industry.

The possibility of dramatic technological advances emphasizes the need for an expanding economy built upon the broadest possible purchasing power base. Automation will increase productivity, but increased productivity without increased total production is a formula for depression. If productivity is increased within a framework of full production and full employment, the nation will prosper. If automation is irresponsibly introduced and exploited, it will bring unemployment and misery instead of

These predictions, if accurate, would mean, for example, that two hundred thousand men could match the present output of the million UAW members in the automobile industry.



security and abundance. The radical productivity increases which will accompany automation make it necessary to intensify the fight for an economy based on full production and full employment.

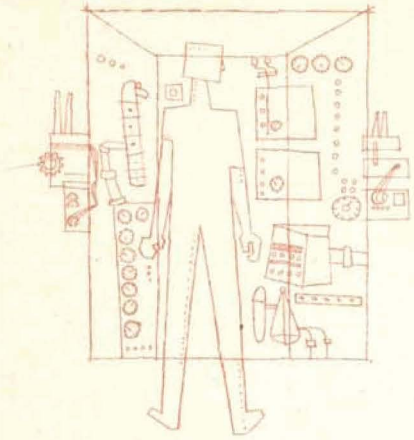
The key to success in this struggle is increased purchasing power in the hands of the people. We must be able to purchase the goods we produce. And, when our productive power increases, our buying power must also increase. The UAW-CIO will make its contribution toward this end by insisting at the bargaining table that purchasing power be increased sufficiently to match our productive capacity. But high hourly rates of pay for our members are not enough. Steady work is essential, week by week, month by month the year around.

Automation and the Guaranteed Annual Wage

The establishment of the guaranteed annual wage becomes imperative for workers in the face of these new and revolutionary technological changes developing in our economy. The wealth-producing potential of automation is matched only by its potential for disruption and chaos unless harnessed in the interest of the nation as a whole. Workers must be provided with employment and income security so that the nation can meet these revolutionary possibilities with a minimum of disruption and hardship.

The guaranteed annual wage represents the most essential element of that needed security structure. The guaranteed annual wage will serve as a regulator of the process of technological change, tending to minimize its disruptive consequences. It will affect management decisions concerning both the timing and the placement of new automation installations so that those decisions will be tempered by a degree of social consciousness.

Under the guaranteed annual wage, management would avoid the introduction of automation in times when major layoffs would result. The introduction of new and more efficient equipment would be geared to periods of expanding markets so that other jobs would be available for the workers displaced by automation.



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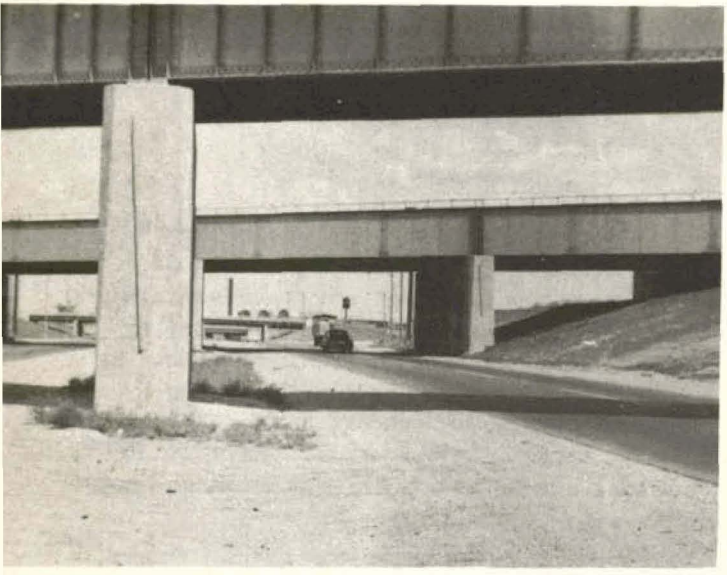

Similarly, the guaranteed annual wage would tend to assure that new and more efficient plants are so located as to avoid mass layoffs of workers employed in existing plants. This is particularly important in view of the fact that it is more economical in most cases to install automation in new plants than in old ones. Moreover, corporations prefer to employ on automated processes workers who have had no experience with older production methods.

In the absence of the guaranteed wage, irresponsible corporate decentralization policies, accentuated by the introduction of automation, would leave

Some of these new machines have dramatic effects, others cause equally large manpower displacement that is not so easily discernible. The magazine, *Factory Management and Maintenance,* reports on "things you won't see in the factory of the future."

> "In the factory of the future, lubrication will be a utility service just like water, steam, and electricity, rather than a manual maintenance operation. You won't see oilers running around with oil cans or pushing lubrication carts from machine to machine. Instead lubricants will be pumped through pipes to each machine from a central source. And measuring units on the machines will feed the lubricant to each bearing in the right amount and at the right time by time clock control. You won't have to stop machines to lubricate them."

> "Your factory of the future will have to have power-operated floor-cleaning equipment. One man on a power sweeper can do the work of several hand sweepers—and do it a whole lot better."

Although the Ford Motor Company has received a good deal of publicity about its automated plants, it is not alone in its modernizing efforts. General Motors, Chrysler, and the independent producers also are installing similar machinery.

Automotive Industries reports that

> "Transfer Machine at Nash has 14 units and performs 179 operations. Man-hours for machining cylinder heads reduced more than 80 per cent."

And R. M. Critchfield, General Manager of the Pontiac Motor Division of General Motors claims that the plant in which the 1955 Pontiac engines are produced

> ". . . surpasses any other plant in the world for up-to-date modern automation equipment."

These examples should make it clear that industry has embarked on a full-scale program of automation. Each company is contesting with the next to see how fast it can automate its plants and thereby reduce its unit labor costs. The changes in manpower requirements, those already in effect and those yet to come, require that the Union give careful attention to manpower displacement problems.

Manpower displacement is not a figment of the Union's imagination. Trade journals contain statements by various management spokesmen clearly indicating the scope of the changes that automation will bring about.

A Ford spokesman said:

> "Automation reduces labor tremendously. Our experience has shown that we can count on a reduction of 25 to 30 per cent in what we call 'direct' labor."

Ward's Automotive Reports states:

> "A passenger car plant, which formerly employed 36 men to feed fenders into a conveyor for spray painting, now has modernized equipment which automatically feeds six sets of fenders to a fast-moving 'merry-go-round' where vari-colored finishes are applied simultaneously. One worker guides the entire operation."

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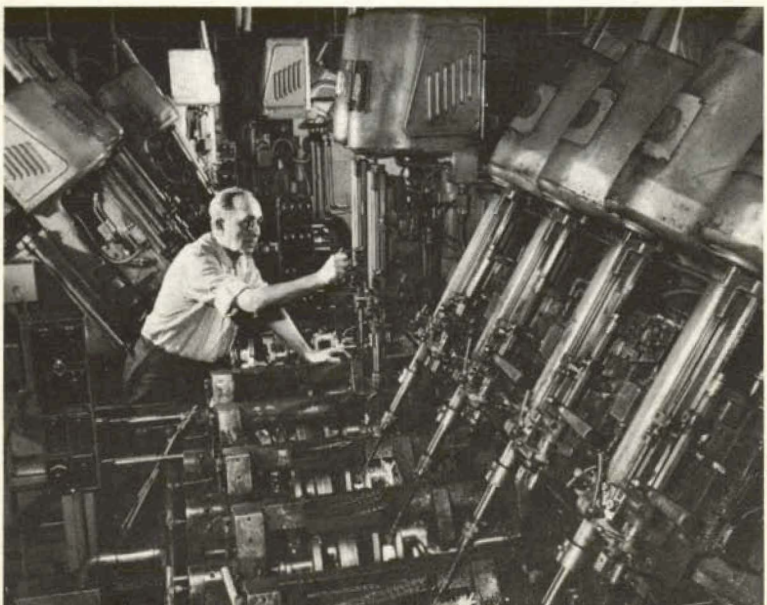
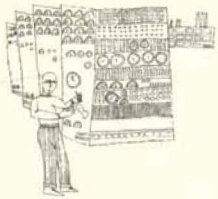


Higher Pay For Automated Jobs



Because of the extreme changes in factory methods caused by automation, existing classifications and wage structures are becoming increasingly obsolete. In new plants the dramatic effect of automation is clearly visible. There the "new job" principle can be invoked more easily to secure new classifications and improved wage rates. In existing plants, however, where automation is installed on a piecemeal basis, it is more difficult both to pin down the degree and kind of change requiring action, and to negotiate the necessary new classifications and rates. In such situations the Union should be alert to obtain new classifications and rates even on semi-automated jobs. Our members must be prepared to continue the fight for the upward revision of rates based on new classifications for automated jobs. Management must be brought around to the acceptance of the principle that automated and semi-automated jobs require new classifications and rates whether in new plants or old.

Any efforts by management to extend existing classifications to cover these new automated and semi-automated jobs should be resisted by the Union. It is important, also, that the issue not be left to umpire or arbitrator determination. Umpires and arbitrators should have no role in the determination of new classifications and wage rates because there are no objective criteria which they can apply. Since these new operations will be the basis for the wage and classification structure of the factory of the future, the Union must maintain maximum freedom to exert its full influence in the shaping of that structure.

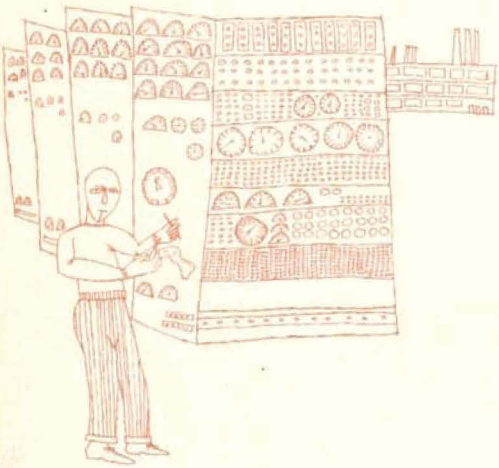
These new classifications and rates should be established in recognition of the changed nature of jobs in which increased responsibility offsets by far any reduction in physical effort and manual dexterity accompanying automation. This increased responsibility, in most cases, flows from the much larger investment represented by the equipment under the individual worker's control. The Chrysler Corporation, for example, stated in its monthly magazine.

> **"In 1952, $8,719.00 was employed per employee. This was a third (32.1%) more than $6,600.00 employed per employee in 1951."**

Such large increases in investment per worker mean increased responsibility per worker. Even where there is no increase in such investment, the individual worker becomes responsible for a much larger volume of output. Automated equipment is a signpost of changed jobs in the factory requiring the

negotiation of new classifications carrying higher rates reflecting the increased responsibility per worker.

Management will attempt, and in some cases has already attempted, to confuse the issue by claiming that the Annual Improvement Factor provisions of our contracts represent all the additional compensation to which workers are entitled in the shift to the new modes of production. This is a fallacious argument which the membership must be prepared to expose and to resist. The compensation for increased productivity represented by the improvement factor, payable to all workers, can in no sense be considered to be compensation to the individual worker whose specific job has been raised to higher levels of responsibility by the introduction of automation. The immense productivity gains of automation should be assessed and then shared equally by all workers in coming negotiations.



Increased responsibility and reduced physical effort, however, can only mean real progress if they are reflected in new classifications and higher wage rates for the individuals concerned, as well as an equitable distribution of the productivity gains . . .

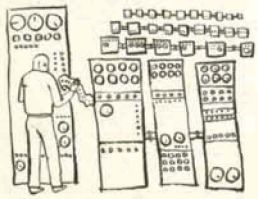
The changed rates and classifications only represent recognition of the changed jobs. In cases such as the following, quoted in *U. S. News and World Report,* the Union obviously has not demanded that an operator receive a wage adjustment to match the productivity gain.

> **". . . on a rocker arm support . . . the necessary drilling, reaming and cutting used to be done by five operators at two machines. They produced at the rate of 38 pieces per manhour. Now, a single operator, with only one machine, turns out more than 750 pieces in an hour. He is 20 times as productive as one was in the old setup."**

The Union is not demanding that this man be paid twenty times his former rate; the Union is not demanding that individual classifications and wage rates reflect specific productivity changes. But the Union demands and expects that where different work requirements, investment, and output provide the obvious proof that a change has occurred, new classifications and rates will be negotiated. But it should be equally clear that these adjustments are separate and distinctly different from the general wage increases which are the result of the operation of the Annual Improvement Factor provision of our contracts. The improvement factor is a general device for adjusting the purchasing power of workers as a group to increased productivity, and it does not alter the fact that job classifications and wage structures, as they relate to individual jobs, cannot remain static in the face of dynamic changes in factory operations.

We expect that new machinery will reduce the physical effort requirements of jobs; this is progress. Increased responsibility and reduced physical effort, however, can only mean *real* progress if they are reflected in new classifications and higher wage rates for the individuals concerned as well as an equitable distribution of the productivity gains.

Changing Skills



Because automation reduces the need for manpower in particular departments and occupations by varying degrees, seniority provisions in our contracts must permit transfers for all workers directly or indirectly affected. Narrow seniority groupings are becoming increasingly obsolete and harmful to our membership. Automation, even in periods of economic expansion, introduces highly complex seniority and transfer problems. In periods of economic decline the effects of

automation on employment levels and job security can produce devastating results.

In addition to reducing the number of workers required per unit of production, automation, in many cases, changes the nature of the skills and training needed on individual jobs. The single spindle drill press operator now tends an automated battery of machines which perform boring, reaming, drilling and milling operations. The sand mixer in the foundry now regulates his mixture by operating a complicated electrically controlled panel board. The chip-puller is being converted to a centrifuge operator.

A top Ford spokesman has stated that there are considerable changes in the kind of jobs that men will do in the factory of the future:

"The hand trucker of today replaced by a conveyer belt might become tomorrow's electronics engineer . . ."

"The hand trucker of today replaced by a conveyor belt might become tomorrow's electronics engineer . . ."

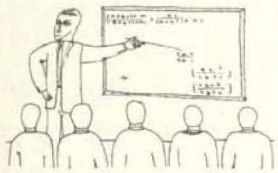
become tomorrow's electronics engineer . . . Drill press operators replaced by automatic multiple drilling machines could be trained as future tool makers."

Changes of this order pose serious transfer and retraining problems. It is apparent that without action by the Union management may not consider it necessary to pay our members a living wage during the period of adjustment when they are acquiring new skills. One management official went so far as to say during a roundtable conference about automation sponsored by *Fortune* magazine that

"I don't think we are consciously trying to ease the burden of our workers, nor consciously trying to improve their standard of living. These things take care of themselves."

The Union will remind the companies with which we bargain of their obligations both to their individual employees displaced by automation and to the nation as a whole. Technological change enables us to raise our standards of living. But provisions must be made so that those immediately affected do not suffer in order to provide society as a whole with long-run benefits. In the course of reaching higher standards of living we will not take one step backward in order to take two steps forward.

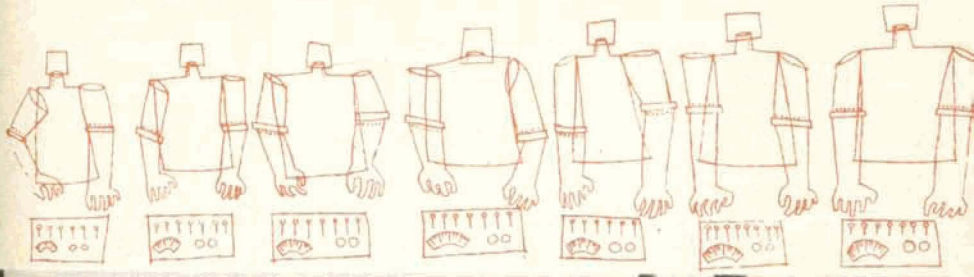
Need For Retraining and Broader Seniority



To meet these problems of manpower displacement within the plants, the Union must give careful attention to modernizing, strengthening, and improving those sections of our collective bargaining agreements governing layoffs, rehires, transfers, and promotions. Contract clauses should be negotiated to provide for the training and retraining at company expense of workers who now must master new skills. The broader the unit within which seniority applies, the greater is the security provided by that seniority. Local seniority agreements, therefore, should provide for the broadest possible seniority groupings to assure equitable seniority protection for the members of our Union. In addition, these local agreements should also contain simple and direct amendment procedures so that the Union can, through negotiations, meet the impact of sudden unanticipated changes.

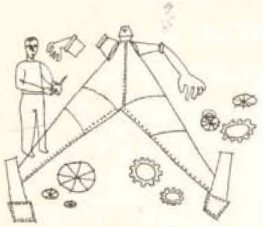
The danger of mass displacement of workers as a result of automation emphasizes in addition the need for extending the protection afforded by

Our agreements with multi-plant corporations must assure displaced workers of the right to inter-plant transfers based on seniority.



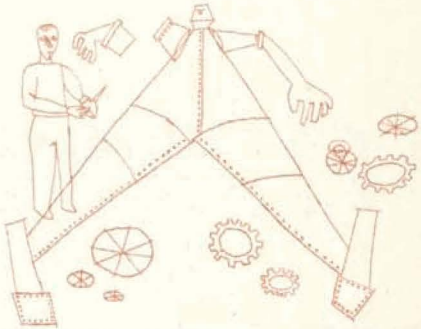
seniority beyond the confines of the individual plant and company. This is particularly important for the older workers whose possibilities of finding new employment diminish with advancing years. Our agreements with multi-plant corporations must assure displaced workers of the right to inter-plant transfers based on seniority. In addition, preferential hiring clauses must be won which require all plants under UAW-CIO contract, when hiring, to give preference to laid-off workers in the same area and industry.

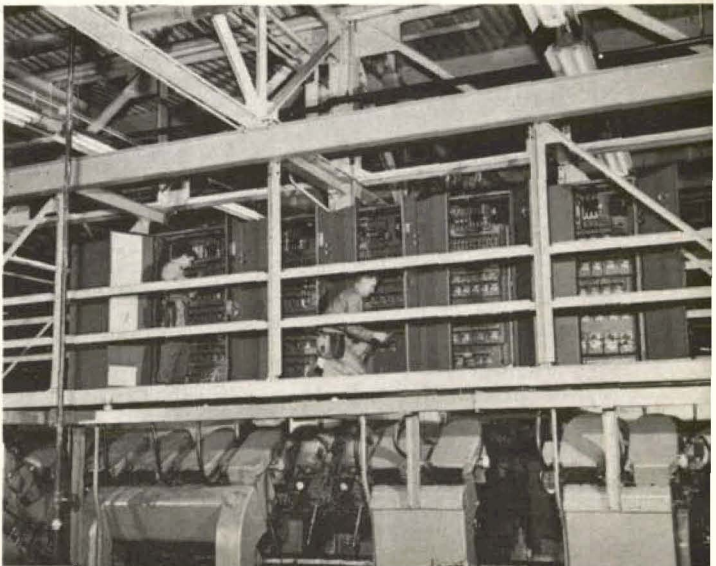
The Role of the Skilled Trades



Automation has also been seized upon 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. Persistence by management in such a course of action, however, is dangerous and shortsighted both from the standpoint of the industry and of the economy as a whole. If successful, such a drive to reduce the number of journeymen employed, by overlapping in the skilled trades 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. The very complexity of automation equipment and the consequent increased need for the highest possible development of journeymen skills would make the deterioration of skilled trades standards an

. . . greatly increases the need for electricians, mechanics, pipe fitters, toolmakers and others skilled enough to do maintenance work on the mechanical slaves.

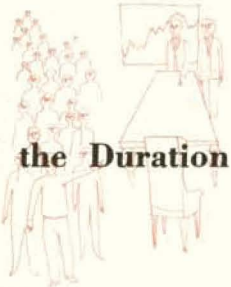




especially serious matter. In *U. S. News & World Report,* a Ford spokesman acknowledges that automation

> **". . . greatly increases the need for electricians, mechanics, pipe fitters, toolmakers and others skilled enough to do maintenance work on the mechanical slaves."**

Accordingly, the defense of the integrity of the apprenticeable trades against overlapping and dilution of journeymen standards becomes an increasingly important Union task in the face of automation. Success in the performance of this task will require the fullest cooperation of the skilled trades workers themselves who must vigorously resist management pressure to do work not properly a part of their respective trades.



Automation and the Duration of Contracts

The sweeping consequences of automation make it impossible to gauge either the exact nature of technological change or its social, economic, and political repercussions. But already it is clear that automation will reduce traditional manpower requirements. It will almost eliminate scrap. Under proper control, automatic equipment will continually turn out high-quality production with speeds beyond those attainable by human beings. Automation will bring about dramatic changes in the composition of our labor force. The typical auto worker of the future may be a skilled maintenance man, engineer, or analyst. Many of the unpleasant jobs will be eliminated; the work clothes of today may be largely replaced by white shirts in the factory of tomorrow.

No one can predict now the magnitude of the increases in productive efficiency which will flow, even within a short period, from automation and other major technological advances now rapidly finding their way into our industries. It is impossible now, for example, to forecast how great an increase will be needed in the improvement factor in order to achieve a proper balance between worker buying power and the increased supply of goods and services resulting from accelerating advances in national economic efficiency. Not only in the interest of our own membership but in the interest of the entire economy as well, our Union must maintain its full

In the face of potential changes of this magnitude, it should be the policy of our Union to insist on short-term contracts in coming negotiations.

freedom to meet the problems arising out of the potentially enormous increases in the outpouring of goods and services.

One example, the electronics industry, can serve to show the kind of change that may occur shortly in our industries. According to a Department of Labor study:

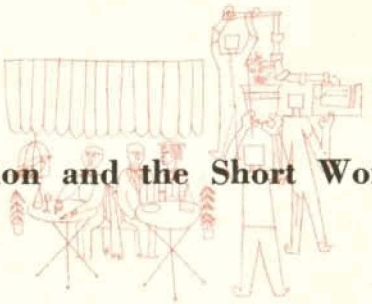
> "Electronics output in 1952 was 275 per cent higher than in 1947 but was produced by only 40 per cent more workers."

This may sound spectacular but the study goes on to say:

> "Output per man may rise even faster during the next few years as a result of improvements in manufacturing techniques . . . These trends toward 'automation' may result in the greatest reduction in unit man-hours in the industry's history during the next few years."

In the face of potential changes of this magnitude, the UAW-CIO cannot tie itself to long-term contracts. To do so would be to surrender in advance the freedom to intensify the fight for higher living standards at the very time when this fight may become more urgent than ever before. If only to maintain economic stability and full employment in the face of rapid progress in our ability to create abundance, it should be the policy of our Union to insist on short-term contracts in coming negotiations.

Under contracts of short duration, our Union will be able to keep abreast of the various developments which tend to step up the pace of advances in productivity. We will be able to evaluate the magnitude of the growth in our nation's productivity potential; and we will fight to turn this potential into higher living standards for all.



Automation and the Short Workweek

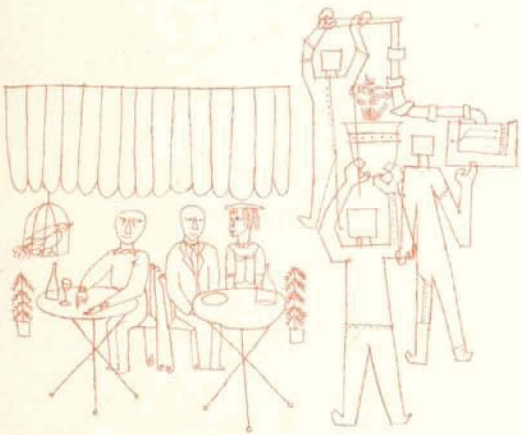
Our Union is committed to the struggle to make the fruits of technological advances available to all, and to work for abundance for people at home and abroad. From the secure platform provided by the guaranteed annual wage and with the freedom provided by short-term contracts the UAW-CIO will continue to fight for an ever-expanding national output.

The enormous potential of automation promises that within a relatively short time, it will be possible for us simultaneously to have both substantially increased living standards and greatly increased leisure in which to enjoy the abundance that we can create.

Our Union, therefore, looks forward to the day when we will take our place in the vanguard of the American trade union movement, in the next round of the historic struggle for a shorter workweek. This day we know is not distant. Barring an increase in international tensions requiring greatly increased diversion of economic resources to defense production, the timing of the fight for a shorter workweek depends basically on the rate of accelera-

tion of productivity advances, and the degree to which our growing productivity potential is utilized.

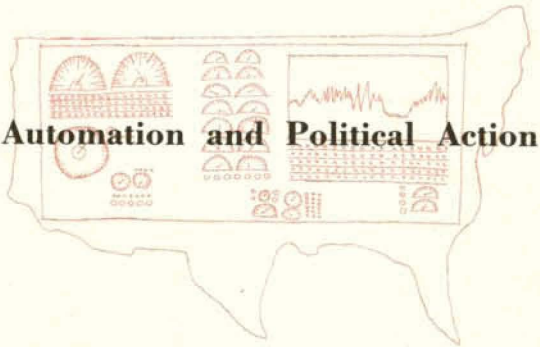
We repudiate and will continue to resist, with all our strength, the philosophy of economic scarcity. We are aware, however, that in the world of industry and finance, growing productive power is not always seen as the tool for the creation of abundance but rather is looked upon merely as an instrument for the increase of profits. If leaders in industry and finance refuse to raise their sights and insist on an economy of low volume and high unit profits, our Union and the rest of American labor will have no alternative but to press immediately for drastic reductions in the workweek



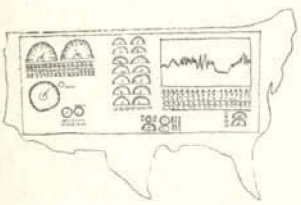
The fight for the shorter workweek and for higher living standards must go hand in hand. The strategy which will determine the timing and relative emphasis of the struggle for these two objectives must of necessity remain flexible at this time.

without loss of income. The UAW-CIO will not stand idly by while the era of automation produces mass unemployment instead of higher living standards and increased leisure.

After the guaranteed annual wage has been secured, therefore, the shorter workweek will take its place at the top of our collective bargaining agenda along with the continuing fight for higher living standards. The fight for the shorter workweek and for higher living standards must go hand in hand. The strategy which will determine the timing and relative emphasis of the struggle for these two objectives must of necessity remain flexible at this time.

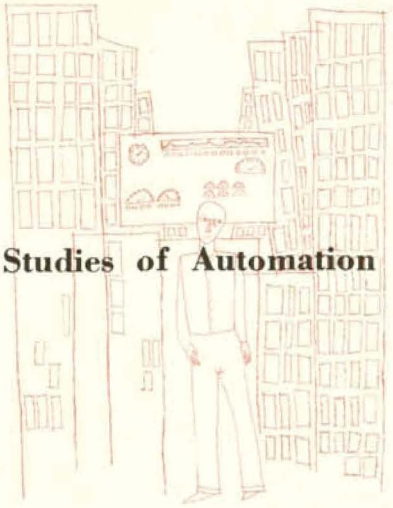


Automation and Political Action



The magnitude of the changes which automation will bring should not be underestimated. Some problems will be solved across the collective bargaining table. Some will require that we join with other likeminded groups in the common fight on the legislative front. The Union will continue to seek the enactment of socially desirable legislation that will give positive direction to technological change. The minimum wage must be raised. National vocational training and retraining facilities must be expanded so that adult members of the labor force will find it easier to acquire the new skills demanded by the changed methods of industrial production. General educational, cultural, and recreational programs must be improved. Drastic improvements in unemployment compensation must be won to cushion the shock of technological displacement for workers not covered by the guaranteed annual wage. The Social Security Act must be amended to provide, if it proves necessary, for earlier retirement for displaced older workers who find it impossible to obtain new jobs.

Relocation allowances must be provided by law to facilitate the movement to new areas of workers displaced from their home communities by new and more efficient plants located elsewhere.

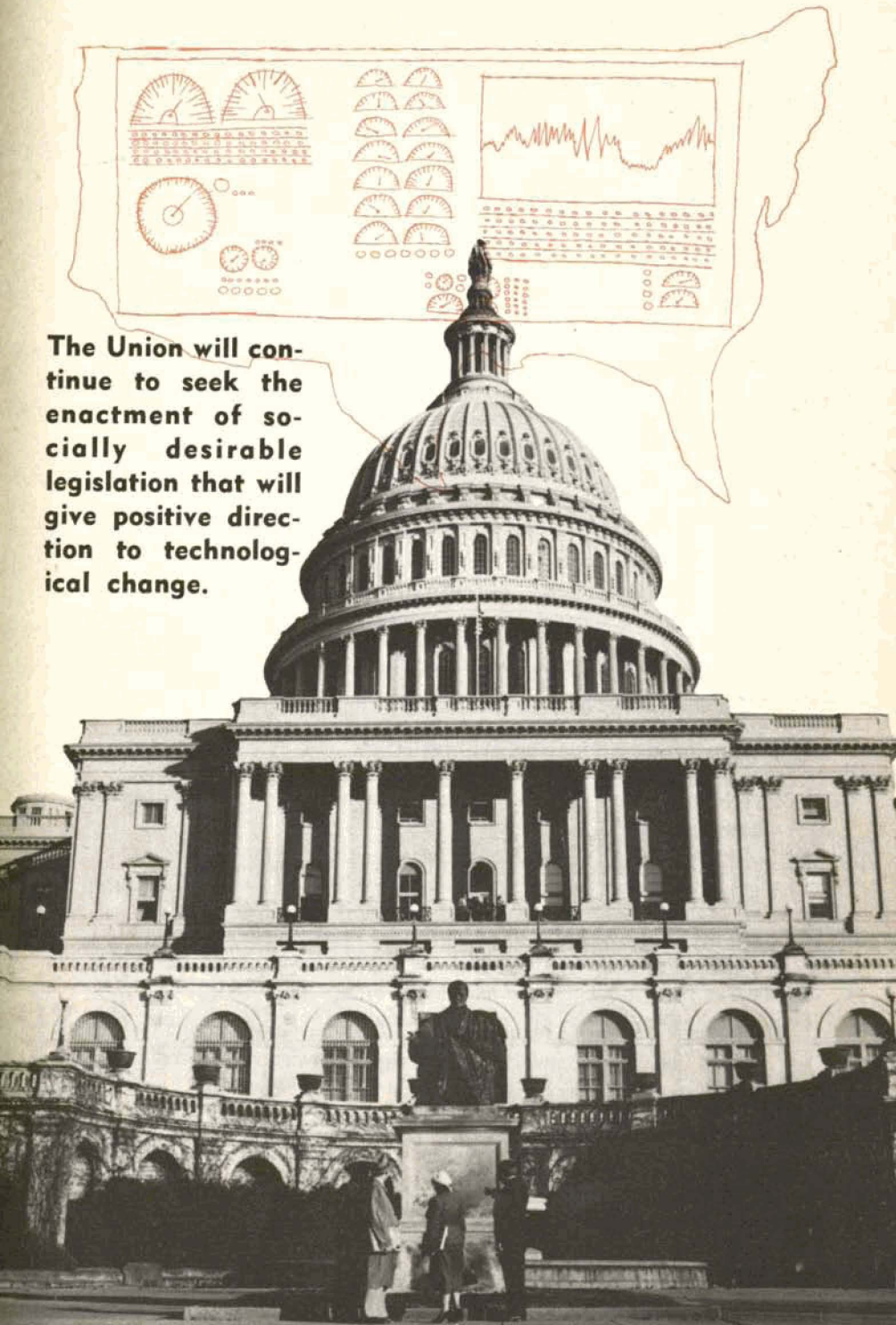


Studies of Automation

The preliminary work done by the UAW-CIO clearly indicates the need for extensive studies of the problems associated with radical technological change. Studies must be made of the rate of introduction of automation and its effects in each of the industries within the jurisdiction of the UAW-CIO and throughout the economy.

These studies must include a continuing appraisal of automation's effect on the size and composition of the manpower requirements and of changes in levels of productivity in these industries. Also, it will be necessary to study questions such as the kind of changes that automation will cause in piecework and incentive pay systems.

There is a need both for detailed narrow studies on a factory by factory basis and for broad studies covering wide areas of our economy. In this connection the Union should encourage various public and private organizations to examine the potential social, economic, and political impact of automation. These studies and those of the Union will enable us to formulate comprehensive programs to ensure that technological advances are for the good of all people.



The Union will continue to seek the enactment of socially desirable legislation that will give positive direction to technological change.

Glossary

An explanation of the words most often used in discussions of automation.

AUTOMATION: The supervision and regulation of the production process by self-operating mechanical, hydraulic, pneumatic, chemical, electrical, or electronic devices.

The word, which was made up about 1950, originally referred to the movement by automatic machinery of parts or materials from one stage in production to another.

Today automation is the principle used to plan automatic factories. Automation includes:

1. the movement of materials and parts from one operation to the next automatically
2. replacing men in the operation of machines by devices called servo-mechanisms
3. replacing inspectors by control devices which inspect products automatically
4. the use of mechanisms which count, fill orders, maintain inventories, re-order, give instructions, and are designed with memories which never fail (so long as the machine is in repair)
5. automatic preventive maintenance (like automatic lubricating systems which not only oil and grease automatically wherever oil and grease are needed, but which also signal the need for repairs)

Automation involves:

1. *information* that is fed to a
2. *controller,* which operates (and supervises to make sure the operation is done correctly)

3. a *servomechanism* which in turn operates the

4. *machine,* which can be a drill, a milling machine, a lathe, a typewriter, or anything else which serves a purpose and all this happens in a self-correcting system which is known as a

5. *feedback circuit*

The Massachusetts Institute of Technology has built a completely automatic milling machine which can do everything that a skilled machinist can do on a conventional milling machine.

Specifications off a blueprint are coded and punched onto a tape by a human operator. This is the INFORMATION, prepared so that the CONTROLLER can use it.

The tape is played on an electrical interpreter, the CONTROLLER.

When the tape is fed into the interpreter, each hole in the punched tape either opens or closes a circuit so that an electrical impulse is sent along a wire to any one of three SERVOMECHANISMS, depending on the blueprint reading.

The SERVOMECHANISMS are motors which work like human hands and which run a machine tool.

The three SERVOMECHANISMS in the automatic milling machine are attached to the table, the cross-slide, and the head of a milling machine.

If a tool begins to wear, the FEEDBACK circuit lights a warning on the control board. If the tool wears too deeply or if something else goes wrong, the machine shuts down.

This installation, which has been designed by the Massachusetts Institute of Technology, can operate one or a dozen, or even more machines. It can operate machines in the same room, or machines connected to it by wires across the country.

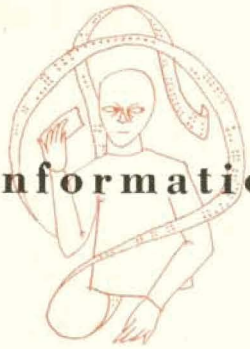
Unlike the automation installations in most plants, this hookup can do many things. In a sense it is an automatic machinist that can work off of any blueprint.

In most factories, however, the machines are designed so they only do one thing, over and over again, in the same way an assembly line worker usually does one thing over and over again.

In these cases, the INFORMATION (the instruction to the machine) is built into the machine. A setting governs its operation.

Then this single purpose machine is usually linked in a series with other single purpose machines. When single purpose machines are joined by devices that carry the parts from one operation to the next, and put them into position to be processed by succeeding machines, the entire bank of machines is called an IN-LINE machine, or a TRANSFER machine.

In summary, automation in a plant may take the form of a multi-purpose machine capable of taking many different kinds of instructions, or single purpose machines, with their instructions built into them.



Information

INFORMATION: What engineers call the directions that are given to the controller on the servomechanism which replaces a human being in the operation of a machine in a factory (or anywhere else).

The information can be an instruction

(a) to reject all parts that are outside a certain tolerance

(b) to open a door when a beam of light is broken

(c) to make a particular part with specified dimensions

(d) to send printed instructions to each department of a factory with respect to the specifications for a car that is to be assembled.

On single purpose machines these instructions take the form of certain settings or shapes on switches, cams, and templates. In turn these switches or other devices are linked to the servomechanisms which guide the machine operation.

On multi-purpose machines where a sequence of operations is performed on a single machine, these instructions are coded into a tape or punched cards. The tape or punched cards are attached to a controller which translates the instructions into electrical impulses (usually) which act as the guides for the servomechanisms which in turn operate the machine that does the work.

Controller

CONTROLLER: The regulating device that receives information or coded instructions and delivers the appropriate signals to operate the servomechanisms in the desired fashion. In effect, it replaces the human brain in the operation of machines in an automatic process.

The thermostat that operates the automatic stoker or the gas or oil burner in your house is a simple controller of this kind. So is the electric eye which starts and stops the device that opens and closes the door of your supermarket.

The controller that directs the machine that makes parts, or assembles electrical equipment or operates accounting machinery is usually designed to read a punched card, or a punched tape, or a magnetic tape or wire.

The punched card, or the tape, carries the information the controller acts on.

Then the controller translates the information it receives into electrical or mechanical impulses which activate a servomechanism that operates the machine, the tool, or the inspecting device.

Besides getting information from the card or tape, the controller also gets information back from the operation itself. (This is called the "feedback" signal).

Whenever there is a deviation from the instructions in the operation, the controller acts to correct the deviation.

Servomechanism

SERVOMECHANISM: The device in an automated operation that follows the command of the controller. The servomechanism replaces human muscular power, whereas the controller replaces human brain power.

Here Business Week describes a servomechanism which replaces a machinist at a lathe.

> "A sensing unit (the controller) reads blueprint dimensions . . . keeps track of the position of the cutting tools and the load on them, controls the tool setting through servo-motors (mechanisms) to bring the stock to the required dimension. As a machinist would, it does whatever is necessary to produce the required part."

Other servomechanisms:

> Operate automatic cutting torches to cut out steel patterns (this is guided by an electric eye which reads a blueprint or a template).
>
> Keep inventory, receive new stock, inspect it, store acceptable stock and send defective stock back to the parts supplier with a note that tells how the stock fails to meet specifications.

Some servomechanisms are electric motors, others are hydraulic pumps or pistons, or pneumatic devices powered by gas pressure; some are mechanical like the stoker that puts coal into your furnace.

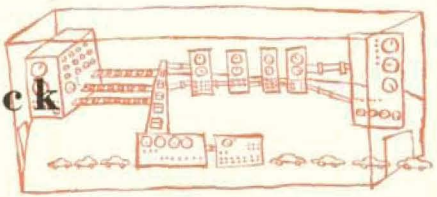
Servomechanisms hooked up to the controls through a feedback system can do almost anything a human being can. Many things they can do better than human beings. They can do some things no human being can approach, primarily because of their faster response.

Servomechanisms boomed during the war when airplanes became so fast that human beings could not aim and shoot guns from them or at them accurately.

Servomechanisms then were designed that could see and recognize enemy planes faster than human beings, and which would use this information to aim and fire anti-aircraft guns at the enemy planes. They were built so that they tracked the planes with a gun, computed their flight paths, fired at them, and, if they missed, corrected the fire and fired again, doing this over and over again, in an electrically split second.

The self-correcting action is the feedback system in operation. In fact, servomechanism is defined by some scientists as "a feedback, power-amplifying control system."

Feedback



FEEDBACK: The technique in which the output (motion, position, size, etc.) is compared with a desired value and the difference used to activate a controller or servomechanism to make the appropriate correction. This is the basic principle of a self-regulating system. Simplest feedback system is a

flyball governor on a steam engine. As the engine speed increases, the flyballs on the governor rotate faster. The faster they spin, the higher they rise. As they rise they pull up a jacknife lever which pushes a stem down. The stem as it slides down slowly closes the entrance valve into a steam chamber. This slows the steam engine down so that the flyballs on the governor spin more slowly and begin to fall. As they fall the jack-knife lever falls, lifting the stem that controls the flow of steam into the steam chamber.

Thus the slowing down of the engine slows down the flyball rotation which opens up a valve that speeds up the engine.

The speeding up the engine increases the spin of the flyballs which closes down the steam and slows the steam engine.

This way the flyball governor keeps the engine speed within two set limits automatically by a self-regulating feedback process.

Thus the system regulates itself automatically.

The automatic compass on a ship operates on a feedback principle. Once the ship is set to steer a certain course, the steering mechanism will automatically swing to the left if the ship moves too far to the right. Then if the correction carries the ship too far to the left, the compass will automatically veer the ship right.

In operation the swings back and forth will become smaller and smaller with each correction, until finally the ship is heading right down the course.

Learning in human beings is based on the feedback principle. Thus you try to do something, correct for the error you perceive, try again, until finally you do what you are trying to do.

It is this feedback principle which is used in AUTOMATED operations. Over a closed circuit the servomechanism, once it starts operating, is controlled by an automatically self-correcting mechanical brain. Any deviation automatically activates a correcting counter-activity until finally, the exact predetermined action is carried out.

Most modern fully automatic control systems are based on the use of an integrated FEEDBACK circuit containing initial INFORMATION, CONTROLLER, SERVOMECHANISMS, machines and inspecting devices.

Punched Card

PUNCHED CARD: By punching holes in a card according to a predetermined code, it is possible to record information on the card.

The punched card then can be put into a machine which will read the code. That is, the punches, by their position open and close electrical circuits which operate servomechanisms.

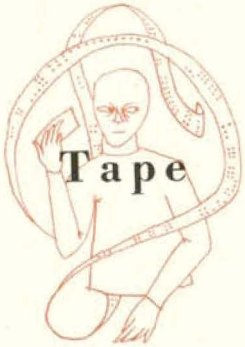
Thus the punched card can give the instructions which are translated into the electrical impulses which operate a lathe so that it follows the dimensions on a blueprint.

Punched cards in some plants operate printing machines, like teletypes, that are located in each department, which gives orders to that department.

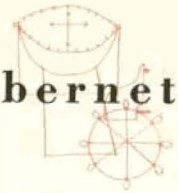
The most widely used kind of card is the IBM (International Business Machine) punched card. Other companies, Remington Rand, for example, make similar cards for use in their machines.

In the Aluminum Corporation of America, all orders are coded onto punched cards which then are fed into a machine that teletypes instructions to all the plants and departments concerned with the order.

Information can be coded onto a tape that is punched like the IBM card. Or the information can be coded into electrical impulses onto a metal or paper tape. Or the information can be put on magnetic wire, like that used in wire recorders.



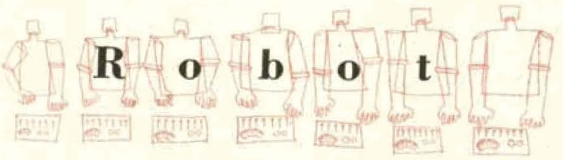
TAPE: Some Automation systems give instructions to machines by using paper, magnetized metallic or plastic tape rather than punched cards. The tape can be punched like cards. Or electrical impulses can be recorded on the tape. In the automatic billing system used by the telephone company, perforated paper is used instead of tape or cards. Holes or electrical impulses, however, are both ways of coding information so that it can be decoded and acted upon by machines.



Cybernetics

CYBERNETICS: The name of the science upon which most developments in automation are based. It comes from the Greek word meaning governor (and the idea comes from the governor on a steam engine). Today it is frequently used as another name for the scientific principles underlying feedback-type servomechanism-operated controllers.

A good and interesting book on this subject is Norbert Weiner's "The Human Use of Human Beings," which costs less than a dollar in any book store.



ROBOT: Mechanical device that behaves like a man. Any mechanical device that replaces a man. Comes from a Czech word meaning slave. Was first used to mean mechanical man in a play by Karel Capek, famous Czech playwright. The play is about a world that ends in disaster because robots which replace human beings as workers and soldiers are used for profit and power and not for the good of mankind.

The play, R. U. R. (Rossom's Universal Robots) is available at most public libraries.

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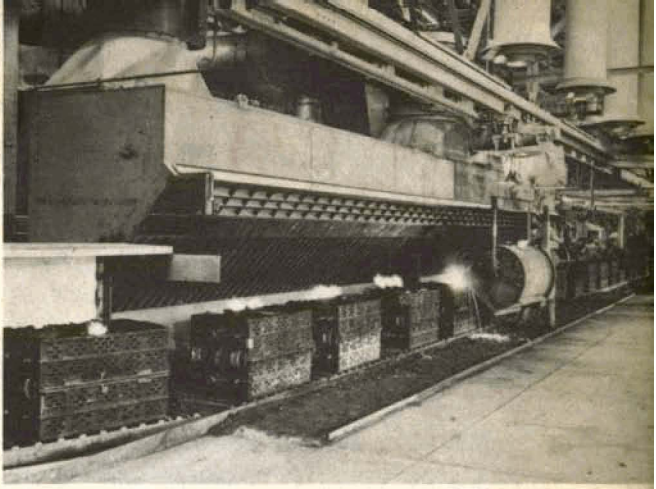

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