

## TECHNOLOGY

# Automation Changes Jobs

Some predict the rapid pace of technological advances will grind to a halt by swallowing up the jobs of the people who buy the goods—By Walter Wingo

(Fourth in a series of five)

► AN AUTO EXECUTIVE, the story goes, was proudly showing his new automated assembly line to United Auto Workers' Walter Reuther.

"I'd like to see you collect union dues from those babies," the executive said, pointing to a complex of computerized machinery.

"First," Mr. Reuther replied, "I'd like to see you make them buy automobiles."

The exchange illustrates what some regard as the seed of automation's suicide. Automation, they say, will grind to a halt when it begins to swallow up the jobs of its own customers.

Labor Secretary W. Willard Wirtz believes it will be a long time before automation starts providing more jobs than it is replacing.

But he did not go so far as Dr. Norbert Wiener, mathematician at Massachusetts Institute of Technology and the father of cybernetics (the study of the way mechanical-electrical systems compare with animal nervous systems), who has predicted automated factories will bring about a depression which will make that of the early 1930's "seem like a pleasant joke."

Others say such cries of alarm are but echoes of the horde of Englishmen who 200 years ago tore down a new spinning factory for fear it would take away jobs.

As it turned out, factories eventually provided many more jobs than they displaced. So, it is argued, will automation.

On the horizon are jobs in new industries such as the generation of atomic energy and the production of transistors, semiconductors and supermetals like columbium, titanium, vanadium and zirconium.

"Over a 25-year span there is no such thing as technological unemployment," wrote one economist.

But a worker who has been displaced from an older industry is not interested in such theories. His main concern is that he needs another job right away.

Automation already is eliminating clerical, bookkeeping, retail sales and assembly-line jobs. The poorly educated have been hit hardest.

Unions in the older industries have set up walls of seniority rights and fringe benefits, forcing younger workers to look to new industries for jobs. But the new jobs generally require greater skills than the old.

"Help Wanted" sections of newspapers are packed with calls for engineers and junior engineers with or without college degrees.

The best jobs in computer fields will go to men well-trained in mathematics and solid state physics. Systems analysts, versed

in computer operations, are expected to take over much of the planning now done by less technical middle managers.

The task of installing, running and maintaining the machinery of the future will demand a new breed of experts. The need for programmers, persons who can convert problems into machine language, will continue to grow.

## Preparing for Automation

There are many small projects to prepare men to take advantage of the new automation. Some computer-makers offer three- to four-week courses on programming their machines.

All that is needed to take the courses, they say, is an average intelligence, an aptitude for "logical" thought and, in most cases, no more than a high school diploma.

The Federal Government and some states have set up experimental programs to re-educate workers in the new technologies. In Pittsburgh, Pa., businessmen, concerned



Burroughs

**MODERN ASSEMBLY LINE**—Only highly skilled engineers and technicians are allowed on this assembly line in which electronic sorter-readers are being made for banks. The devices are part of magnetic ink "reading" systems. The men above are checking out the pieces. The tedious job of assembling the complex parts is handled by machines.

over high unemployment there, sponsored a free school in computer programming.

Courses in programming, like other subjects based on logic, are well-adapted for presentation by teaching machines. The day will come when men replaced by one type of machine will rely on teaching machines to prepare them to master still other machines.

There are doubts, however, about the lasting value of such specialized training.

"Under automation, a school could do a student no greater disservice than to prepare him, as so many do today, for the first job," said Peter F. Drucker, management professor at New York University.

"If there is one thing certain under automation, it is that the job—even the bottom job—will change radically and often."

Prof. Drucker predicted that automation eventually will replace the "trained barbarian," the man who has acquired high gadgeteering skill but not the normal equipment of educated people. In the highly automated world of the future, the man with a good liberal arts education will be more important than ever.

• Science News Letter, 84:326 Nov. 23, 1963

## SPACE

### Lowest Temperature in Atmosphere Recorded

► THE LOWEST temperatures possibly ever measured in the earth's atmosphere have been recorded by sounding rocket by scientists at the University of Stockholm, Sweden.

Temperatures as low as minus 143 degrees Centigrade were computed above Swedish Lapland in scientific experiments jointly conducted by the Swedish Space Committee and the National Aeronautics and Space Administration.

The experiments were made to study the behavior and nature of noctilucent clouds, clouds that shine in the night, at altitudes up to 60 miles.

Four Nike-Cajun rockets, carrying scientific instruments, were launched from Kronogard between July 27 and Aug. 7, 1963. Two were fired to measure temperatures and winds while noctilucent clouds were present, and two were fired in the absence of such clouds.

Explosive sound grenades were fired at varying intervals from the rockets, and the resulting sound waves were picked up by ground-based microphones. The sound velocities recorded show the temperature and winds in the layer.

The temperature of the atmosphere increases from about minus 50 degrees Centigrade at 10 miles to slightly more than zero degrees at 32 miles.

Higher up, the temperature decreases again to reach a minimum at about 50 miles of minus 120 degrees when noctilucent clouds were not present. However, when the clouds were present the temperature was minus 143 degrees.

This appears to be the lowest temperature ever measured in nature, supporting earlier conclusions that noctilucent cloud particles are apparently coated with a layer of ice.

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