

AUTOMATION IN ELECTRONICS

... Without Automation, Electronics Could Not Exist ...

TECHNICAL people are constantly astonished and nonplussed when they read the current polemics about automation and its supposed resulting unemployment.

To them it is clear that automation, with us since 1733, *creates more employment* in the long run. True, automation may at times cause dislocation in certain industries, but never for very long.

Let us take an outstanding example. In 1920, the American Telephone & Telegraph Co. had only manual operators, a total of 228,900 employees. There were 8,000,000 phones at that time. Then it turned to automation—the dial telephone system—eliminating nearly all hand-switchboard operators. Today, AT&T employs nearly 750,000 workers and we have over 70,000,000 phones! Such a quantity of phones could not be handled by manual operators—the phenomenal growth of the telephone industry has been made possible by electronics. But automation, instead of decreasing the number of employees, has vastly increased it. More skilled and specialized jobs have been opened up by electronics than were eliminated when electronic circuits and devices replaced operators.

A few years ago, the Corning Glass Co. with a small staff turned out hand-blown 20-inch television glass picture-tube shells for \$75 apiece—at a loss. Then they built an automatic machine that turns out 21-inch tube shells for \$9.89 each at a profit! On top of this, Corning now employs 2,000 people on TV picture-tube manufacturing—*people who have jobs that never existed before!*

It is incomprehensible that so many people fail to understand that automation means **new things** in nearly every instance. And new things mean **more work**.

Consider the following: We will mention only a single industry, radio electronics. In 1929, only 30 years ago, many of our radio receivers were still battery-operated. There were less than 11,000,000 radio sets in the United States then. In 1959, there were over 150,000,000. Most of the present-day radio tubes were unknown. Television was in the laboratory blueprint stage. Coast-to-coast broadcasting hookups were entirely via land lines. The coaxial cable still was in the future, as was microwave relay cross-country transmission. In 1929, there were no transistors, no light portable radios with concealed aerials, no pocket radios, no

high fidelity, no stereo, no FM broadcasting, no magnetic recording tape, no germanium rectifiers, no proximity fuze, no radar, no guided missiles, no electronic instrument landing for airplanes, no handy-talkies, no practical two-way mobile radio, no radio astronomy, no electronic computers, no ultra-high-frequency transmissions, no atomic batteries, no solar batteries and none of several hundred other radio-electronic inventions commonplace today, but unknown a quarter-century ago.

In 1929, the radio-electronics industry was small and insignificant. Today it has achieved an annual turnover of almost \$14,750,000,000! It employs over 1,000,000 people, *all on jobs that did not exist 25 years ago*.

Many of these radio-electronic items are now made by automation, with more being manufactured in this manner constantly.

Is it not elementary that only mass-produced articles—consequently only articles that are in constant demand—are turned out via automation?

An automation machine calls for a capital investment of from \$50,000 to over \$1,000,000. Would anyone in his right senses spend such sums if the end product to be automated did not already have a huge market?

What usually is not realized is that nearly every new and successful invention spreads out continuously, creating endless new branches like a living tree. Take the telephone, the automobile, the airplane, television—each has thousands of new facets, all creating new employment where none existed before.

Add to this our rapidly growing population that increases demand of most items constantly. Under such pressure even automation, at times, falls behind.

Automation in our present technological age is the one absolutely necessary link to allow us to expand indefinitely. Without automation, our industry would choke from constant bottlenecks. Without it, our rapid industrial growth would be impossible despite new inventions and new devices. Today our population numbers nearly 180,000,000. By 1975, there will be 200,000,000.

Full automation by that time will supply most of our needs and give us a shorter working day with far more leisure.

—H.G.