

Industry would also have to convert 125,000 machine tools, 25,000 grinders and finishers, 40,000 metal forming machines and 12,000 production welders now in use.

The biggest stumbling block to wide acceptance of automation appears to be lack of development of standardized units that would not have to be scrapped every time there is a model change.

Industry also seems to want "greater versatility in the control and operating equipment to handle wider ranges of sizes or more complex operations than is now possible."

Surprisingly, it was found, relative high cost of present automation equipment is not as frequently mentioned an objection as might have been expected.

Automation is best adapted to the medium-sized plants having from 250 to 1,000 employees. These medium-sized plants feel that 16% or more of their operations can be automated. Plants employing more than 1,000 persons estimate 20% of their operations can be automated.

Small plants with less than 250 employees face the biggest problem of automating their production. Automation is practical in many small plants in which production is relatively continuous on one or two products.

"As yet," the ASTE finds, "there is no major expectation that automation can be

applied profitably to job-shops or job-lot runs." Although the Society surveyed metal working industries primarily, other industries are also sure that automation will work for them. A very large producer of plumbing supplies, for example, said that 70% of the foundry operations were automatable and a small producer of garden and lawn tractors said that from 50% to 60% of final cleaning and painting could be automated.

Automation, though a new word, is not a new idea.

The word "automation" was originated by D. S. Harder, executive vice-president of the Ford Motor Company, to describe a system for the automatic handling of parts between progressive production processes.

"Technological changes have been historically characteristic of all American industries, and account for a large part of the rise in the American standard of living," the Ford engineers explain.

"The petroleum and chemical industries, food and beverage processing industries and such non-manufacturing organizations as the telephone services have mechanized or automated their operations to an extremely high degree without particular notice being taken by the public of the advancing technology. And a flour milling operation which approached complete automaticity has been reported dating from 1784-1785."

Science News Letter, March 17, 1956

## PHYSICS

## Weaken Nuclear Glue

➤ ENORMOUS ENERGIES, far in excess even of the raging nuclear fires of hydrogen bombs, would be tapped if the nuclear glue of atomic hearts were weakened, an Atomic Energy Commission scientist has reported.

Dr. George G. Manov, AEC Commissioner Willard F. Libby's technical assistant, suggested studies with very powerful atom smashers now being built may yield clues to possible methods.

Discovering the composition of the mysterious force that keeps atomic hearts from flying apart, in spite of tightly packed positive charges that usually repel each other, is "the very frontier of science," Dr. Manov told students at Phillips Academy, Andover, Mass.

This atomic glue, he said, must possess some extremely interesting properties:

"Although it must have no net charge in itself, it is able in some manner to neutralize these tremendously powerful repulsive forces (of like charges) and to give considerable stability to the nucleus."

We may be on the verge of a totally new discovery, Dr. Manov said.

Scientists have long sought to learn what binds together the contents of atomic hearts. A bewildering number of particles, more than 20, can be driven out of the nucleus, yet no satisfactory theory to account for them is known. (See SNL, May 21, 1955, p. 330.)

However, mathematicians and scientists investigating energy levels within the atomic core, Dr. Manov said, have discovered certain regularities. They relate the atomic number of various chemical elements to the force that seems to glue together the electrical charges.

One nuclear particle, not yet isolated, for which an intensive search is being made is the elusive neutrino, the tiny neutral, massless particle needed to balance the energy equations of nuclear disintegrations.

Science News Letter, March 17, 1956

## MEDICINE

## Two Hormones Help Some Cancer Patients

➤ THYROID HORMONE and the adrenal gland hormone, cortisone, have been given to 40 patients with advanced breast cancer with good effect in about a third of the patients, the American Cancer Society announced. The treatment has been given over the past three years by Dr. Henry M. Lemon of Boston University.

A third of the patients were not helped and another third improved temporarily but for no longer than six months.

The results are considered as good as those obtained by removal of the adrenal glands or of the pituitary gland.

Science News Letter, March 17, 1956

## ENTOMOLOGY

## Funds Asked to Fight Tree-Killing Moth

➤ THE FEDERAL GOVERNMENT may decide to lend a hand in the fight against the voracious, tree-killing gypsy moth.

Congressmen from seven states threatened by the moth requested from the House appropriations subcommittee a total of \$3,000,000 to fight the pest. The request is believed to mark the beginning of a more intensive Federal program for controlling the insect in infested areas.

Spearheaded by Rep. William B. Widnall (R., N.J.), representatives from Illinois, Kentucky, Minnesota, Mississippi, North Carolina and Washington asked for \$1,500,000 for this spring and a similar amount for next spring to be used chiefly for spraying gypsy moths.


Spread of the gypsy moth has been blamed on hurricanes that have struck the eastern seaboard since 1938. Gypsy moth egg masses carried by bits of debris have been blown from their original New England habitat into northeastern Pennsylvania, northern New Jersey and most of Long Island.

The two-inch, red-tufted, bristled caterpillar is advancing westward and southward at an unprecedented rate. Midwestern states not yet affected are joining in the request for funds to enable the eastern areas to control the pest more effectively.

The money would be in addition to \$545,000 already appropriated for gypsy moth control by the Federal Government and would supplement \$1,500,000 now used for moth control by state governments.

It has been estimated that one additional acre of land can be sprayed for each Federal dollar appropriated.

Science News Letter, March 17, 1956



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