

Can Electronic Brains Be Taught to Think?

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after studying the questionnaires, had managed only 43 percent correct diagnoses!

Future models of such "health meters" small enough to be worn by the user could eliminate the need to visit the doctor, predicts one electronics expert. The information from the meter could be relayed to the doctor by telephone. Additional refinement of these machines might even make the doctor unnecessary, one physician jokingly suggests. Instead of the machine yielding a diagnosis, out would pop a prescription!

Another startling new concept in automatic machinery is the TransfeRobot. This one-armed robot performs many routine tasks involving parts handling, assembling, and machine operating. It can be "taught" to perform these tasks in any sequence.

In a notable switch to automation, a big Port Arthur, Tex., oil refinery last year became the first petroleum plant to employ full-time computer control. Formerly, plant employees had to read and interpret a host of gauges and meters. Now all this information is fed into the brain, which virtually runs the refinery, processing data from 110 sources to control 16 different pressures, flows, and temperatures.

In the coal industry, a robot mining machine drills 1,000 feet underground while the operator at the controls of the electronic brain remains on the surface. One machine used by a San Francisco auto-parts dealer keeps an automatic credit check on customers. If an order exceeds the customer's credit limit, the machine automatically places the order on a C.O.D. basis.

With a \$100,000 electronic brain now being readied to scrutinize Federal income-tax returns, you'll also have to be more careful than ever in figuring out your taxes. One state recently used its electronic equipment to ferret out a group of heirs who owed a \$75,000 inheritance tax.

But Can They Think?

Whether the "brains" can really be taught to "think" for themselves has long been a matter of heated debate among semanticists and scientists. The answer, of course, depends on what is meant by "think."

"It is false to assume that a machine cannot possess any originality," contends Dr. Norbert Wiener, professor of mathematics at the Massachusetts Institute of Technology and generally regarded as the high priest of these talented machines.

Given a certain set of instructions, machines are capable of highly creative results. One computer, using its stored set of rules of musical note sequences and harmony, was able to compose fairly good, or at least original, pieces of music.

Machines have been taught to play sophisticated games of checkers, chess, and bridge—and to improve their playing with experience. One computer successfully proved about 300 theorems in logic, while another was taught to solve problems in

trigonometry, algebra, and geometry.

That computers will make 80 to 90 percent of industry's executive decisions in the near future was predicted recently by D. B. Paquin, president of the National Machine Accountants Association.

It's still too early to say what effect all this will have on your job. Some pessimists feel that it might demoralize humans not only to be taking orders from machines, but also to fear the possibility of their eventually being replaced by mechanical "scabs." On the other hand, most authorities believe that automation won't create a shortage of jobs, although it could very well change the nature of many. And, as they also hopefully point out, humans will always be necessary to make the machines—that is, unless this job is taken over by machines, too!

They'll Be Homemakers, Too

"In the 1970s, the American home will probably be run by an electronic brain that wakes the children, gets breakfast, turns on the bath water, and warms up the car," predicts Dr. Anna L. Rose Hawkes, president of the American Association of University Women. "But an electronic robot will never take the place of a housewife. There still has to be someone to push the buttons."

Housewives will have a helper to look forward to in the form of a "mechanical maid," now being developed, which will dart out from the wall at the push of a button to scrub, rinse, and dry the floor automatically, moving in a predetermined pattern. Another member of the push-button kitchen, also experimental, will be a self-propelled serving cart which will deliver silverware and plates to the dining table. After dinner, this silent butler, stacked with the dirty dishes, will return to its hiding place in the wall, where it will dispose of the scraps and wash the dishes!

Other such machines could revolutionize the handling of mail, so you might get a letter in a matter of hours. One experimental machine is serving as a mechanical postman by reading printed and typed addresses on envelopes, and sorting them into more than 40 destination slots at the rate of 10,000 letters per hour. New models already in the works will even be able to read handwritten addresses.

Even more remarkable is the prospect of machines that hear. Impossible? Only recently, RCA demonstrated a machine that understands 10 spoken syllables, is now working on another that will convert 100 speech sounds into writing. Even the chore of letter-writing will be easy: you'll be able to talk your letter into a voice-controlled typewriter. You may even be able to bark a number at your telephone and have it do the dialing for you. The ultimate in telephones or mechanical translators is also not too hard to imagine: you speak in one language, and it comes out in another.



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