The New Teachers

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The percentage of older people in the world is increasing and that of younger people decreasing, and this trend will continue if the birthrate should drop and medicine continue to extend the average life span.

In order to keep older people imaginative and creative and to prevent them from becoming an ever-growing drag on a shrinking pool of creative young, I have recommended frequently that our educational system be remodeled and that education be considered a lifelong activity.

But how can this be done? Where will an the teachers come from?

Who says, however, that an teachers must be human beings or even animate?

Suppose that over the next century communications satellites become numerous and more sophisticated than those we’ve placed in space so far. Suppose that in place of radio waves the more capacious laser beam of visible light becomes the chief communications medium.

Under these circumstances, there would be room for many minions of separate channels for voice and picture, and it is easy to imagine every human being on Earth having a particular television wavelength assigned to her or him.

Each person (child, adult, or elderly) can have his own private outlet to which could be attached, at certain desirable periods of time, his or her personal teaching machine. It would be a far more versatile and interactive teaching machine than anything we could put together now, for computer technology will also have advanced in the interval.

We can reasonably hope that the teaching machine will be sufficiently intricate and flexible to be capable of modifying its own program (that is, “learning”) as a result of the student’s input.

In other words, the student will ask questions, answer questions, make statements, offer opinions, and from all of this, the machine will be able to gauge the student well enough to adjust the speed and intensity of its course of instruction and, what’s more, shift it in the direction of the student interest displayed.

We can’t imagine a personal teaching machine to be very big, however. It might resemble a television set in size and appearance. Can so small an object contain enough information to teach the students as much as they want to know, in any direction intellectual curiosity may lead them? No, not if the teaching machine is self-contained—but need it be?

In any civilization with computer science so advanced as to make teaching machines possible, there will surely be thoroughly computerized central libraries. Such libraries may even be interconnected into a single planetary library.

All teaching machines would be plugged into this planetary library and each could then have at its disposal any book, periodical, document, recording, or video cassette encoded there. If the machine has it, the student would have it too, either placed directly on a viewing screen, or reproduced in print-on-paper for more leisurely study.

Of course, human teachers will not be totally eliminated. In some subjects, human interaction is essential—athletics, drama, public speaking, and so on. There is also value, and interest, in groups of students working in a particular field—getting together to discuss and speculate with each other and with human experts, sparking each other to new insights.

After this human interchange they may return, with some relief, to the endlessly knowledgeable, endlessly flexible, and, most of all, endlessly patient machines.

But who will teach the teaching machines?

Surely the students who learn will also teach. Students who learn freely in those fields and activities that interest them are bound to think, speculate, observe, experiment, and, now and then, come up with something of their own that may not have been previously known.

They would transmit that knowledge back to the machines, which will in turn record it (with due credit, presumably) in the planetary library—thus making it available to other teaching machines. All will be put back into the central hopper to serve as a new and higher starting point for those who come after: The teaching machines will thus make it possible for the human species to race forward to heights and in directions now impossible to foresee.

But I am describing only the mechanics of learning. What of the content? What subjects will people study in the age of the teaching machine? I’ll speculate on that in the next essay.