

Some of these developments are probabilities, some of them are certainties, and all of them are or soon will be within the capabilities of the computer art. But one fact is absolute: the incredible growth of the computer in numbers, power, and availability.

In just 10 years, the typical electronic data processor has become 10 times smaller, 100 times faster, and 1,000 times less expensive to operate. These trends will continue, and our national computing power, which is doubling every year, will soon be sufficient to make the computer a genuinely universal tool.

In 1956, there were fewer than 1,000 computers in the United States. Today, there are 30,000, or more than \$11 billion worth; and by 1976 the machine population may reach 100,000. And these figures will, of course, be greatly increased through the growth of data processing in other nations.

A decade ago, our machines were capable of 12 billion computations per hour; today, they can do more than 20 trillion, and by 1976—a decade from now—they will attain 400 trillion—or about 2 billion computations per hour for every man, woman, and child. Quite evidently, the threshold of the computer age has barely been crossed.

Nevertheless, for all its potential to stretch the mind a thousandfold, it is perhaps necessary to point out that the computer is still a thing—that it cannot see, feel, or act unless first acted upon. Its value depends upon man's ability to use it with purpose and intelligence. If his postulates are wrong, the computerized future can only be a massive enlargement of human error.

Ramsay MacDonald once warned against "an attempt to clothe unreality in the garb of mathematical reality." Computers echo this warning. For they cannot usurp man's unique ability to blend intuition with fact, to feel as well as to think. In the end, this remains the basis of human progress.

The task ahead will be to assign to the machine those things which it can best do, and reserve for man those things which he must provide and control. It is my conviction that society will adjust itself to the computer and work in harmony with it for the genuine betterment of life.

THE NEW COMPUTIZED AGE—9: WHITHER PERSONAL PRIVACY?

Computer Technology May Enlarge Man's Liberty or Inhibit It; New Rules Must Be Made; New Questions Answered

(By John Lear)

Between my resignation as an editor of the slowly dying Collier's and the inauguration of SR's Science and Humanity Supplement, I was for a short while a minor adviser to Thomas J. Watson, Jr., son of the founder of the International Business Machines Corp. My experience there contradicted two popular beliefs about IBM.

The first belief was that all IBM employees were required, as a condition of employment, to wear white shirts on the job, stay sober at home, and maintain upright on their desktops identical copies of a small sign bearing the personal command of Thomas J. Watson, Sr.: "Think." I wore light blue shirts, drank cocktails at lunch, and put the "Think" sign on the windowsill of my office whenever my secretary put it back on my desk; yet I had a standing invitation to young Tom's sanctum.

The second of my working conditions that ran against supposed IBM tradition had to do with that then-new phenomenon, the so-called "giant brain," or high-speed electronic computer. IBM has sold an enormous number of electronic computers. According to legend, a loyal IBM salesman would leave his wife if necessary to clinch another sale. The truth about IBM computer sales, as I experienced it, was that an immense share of IBM's sales investment went into persuading eager customers to delay the purchase of computers.

Delaying was sound business practice because a computer can do only what it is told to do; it must follow instructions literally; until the instructor himself is sure where literal pursuit of a long series of tiny steps will lead, turning the task over to a computer can be dangerous. The machine may complete its assignment before its owners realize that the outcome isn't really the one they seek.

The period of my IBM experience dates back roughly a dozen years. At that time, computers could do only one thing at a time, in sequence. Computer programmers—the people who break everyday English into binary arithmetic messages (consisting entirely of numerical zeros and ones) comprehensible to the ma-