

AUTOMATION AND THE DIGNITY OF THE ARCHIVIST

by

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Anyone who has attended this meeting* expecting to hear from me a brilliant discourse on the philosophical pros and cons of automation with frequent allusions to ways in which automation per se does or does not threaten the dignity of the archivist, is going to be disappointed. As far as I am concerned, there is in reality no issue at stake, for the simple reason that there is no actual threat. Automation has in it no more danger to human dignity than did the wheel, the steam engine, or the electric generator. However, it is still obvious that a serious psychological problem exists - one which often impedes progress towards automation or anything resembling it. Just to mention the words "computer" or "automation" in some circles is to invite cold suspicious stares of hostility, making one feel as though he had just said something dirty. Obviously, we have succeeded in striking a responsive chord! The nature of the response as often as not is fear, usually born out of ignorance. What we are witnessing, of course, is a contemporary manifestation of man's natural fear of the unknown. As a group of eminent American sociologists, serving as a special presidential Research Committee on Social Trends wrote in the 1930's:

— Social institutions are not easily adjusted to inventions. The family has not yet adapted itself to the factory; the church is slow in adjusting itself to the city; the law was slow in adjusting to dangerous machinery; local governments are slow in adjusting to the transportation inventions; international relations are slow in adjusting to the new communication inventions; school curricula are slow in adjusting to the new occupations which machines create. There is in our social organizations an institutional inertia, and in our social philosophies a tradition of rigidity.¹

I am not going to attempt to analyze the reasons for this "institutional inertia" and "tradition of rigidity". There are many persons of far greater knowledge who have already done so. What I would like to do, however, is to describe very generally what automation means to me. I would hope that, when taken with the more specific thoughts already expressed today, we shall be able to see that the capacity for good or evil, for enhancement or diminution of our dignity, lies in the human beings who attempt to make use of it or administer those who do, and not at all in the nature of automation itself.

Just in passing, if I might be allowed to dangle a red herring in front of you, I might state that to my mind the greatest danger to the dignity of the archivist is the tendency towards specialization, usually in the interests of efficiency. By this I do not mean specialization by subject area, but specialization by function, wherein one becomes slotted as a "reference" archivist, an "accessions" archivist, or one concerned solely with the production of catalogues or indexes. As he becomes more highly specialized functionally, the archivist will lose his

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manoeuvrability and much of his freedom of action. In our technological age, of course, such a trend is probable with or without automation. The difference is that, if pursued in the interests of and aided by automation, the process likely will occur much more quickly and much more efficiently.

Automation is, of course, merely the third phase of the industrial revolution which began in the eighteenth century. The two earlier phases were mechanization and the assembly line (or the "disassembly" line, as the prototype might be called, since the concept was borrowed from the Chicago meat-packing industry, which had been practising progressive dissection of carcasses on conveyor belts since the 1870's²). While many definitions of automation are available, I personally favour the short description provided by our colleague Elizabeth Wood: "... the term automation [she writes] applies to the use of machines, particularly electronic ones, to reduce repetitive human activities of 'observation, effort, and decision.'"³

Modern electronic computing machinery differs from conventional machines in one important way. Whereas the older machines merely do physical labour, computers are able to make decisions and perform control functions. Let it be stressed immediately, however, that a computer does not think through an intuitive process as we do. All it really does is react to a given set of circumstances according to a given set of instructions (its programme). Its degree of competence is dependent upon the accuracy and thoroughness of the programmer and the programme.

What is the principle behind this ability to react, to perform control functions? The principle is that of feedback, which Webster's Dictionary defines as: "the return to the input of a part of the output of a mechanism, this part of the input constituting information that reports discrepancies between intended and actual operation and leads to a self-correcting action that can be utilized." In other words, a computer has the capability of communicating changes in condition back to its control mechanism, which then computes the significance of the change and adjusts output accordingly. In an industrial setting, therefore, the suitability of a machine-made product does not have to be measured by human hands and eyes; nor does the machine have to be adjusted manually. Both processes - measurement and control - are handled automatically. Of course, we have examples of the feedback principle in action much closer to home, quite literally. The most obvious example: the common thermostat, first patented in 1830, which through feedback of information and automatic correction very effectively controls the degree of heat or lack of it in your home, your hot water tank, your oven, and your refrigerator.

Feedback, however, is not a new principle, although a thorough understanding of the principles behind it may be of fairly recent vintage. Actually, it is as old as animal life on this planet, controlling every movement of every animal (including man) since the dawn of time. The reason why I am able to maintain a more or less erect stance here at this lectern is that my sense organs are continually feeding back messages to my brain, which simultaneously is exerting control over my various muscles, which thereby keep me in this position. What I am trying very briefly to suggest is that automation is nothing more than an "extension of man". In the words of a British commentator, Sir Leon Bagrit, modern science and technology appear to be leading towards "the erection of a series of machine-systems based on man as a model". Automation, he writes, is

that part of . . . "the extension of man" which integrates

all the sensing, thinking and decision-making elements. ...It is a concept through which a machine-system is caused to operate with maximum efficiency by means of adequate measurement, observation and control of its behaviour. It involves a detailed and continuous knowledge of the functioning of the system, so that the best corrective actions can be applied immediately they become necessary.⁴

Here is the essential way in which automation differs from pure mechanization. Mechanization is dependent upon human measurement and control to keep it on the right path. An ordinary machine must be watched continuously to avoid its witlessly plunging ahead, repeating an action despite changes in condition. An automated system, however, (assuming it has been programmed properly) will either correct itself or stop and, in effect, ask for further instructions. Until the controlling device receives those instructions, all is at a standstill. The moment it does receive the new information, it will digest it, compute its significance, and issue new instructions to its mechanism more quickly probably than it took the person who supplied the new data to type it into the console. The man in charge, therefore, is simply extending his own faculties, in that he is using a computer to measure, observe and control, instead of having to perform these functions himself. Often what is happening is that the computer is doing calculation of data which the man himself could be doing - if he had enough time! The man in charge of an automated system is not a slave to a machine; he is master of it. It stands ready to serve his wishes.

The result should be, as Peter Drucker wrote over a decade ago, that "automation will lead to 'the human use of human beings' - that is, to our using man's specifically human qualities, his ability to think, to analyze, balance and synthesize, to decide and act purposefully - instead of using him, as we have done for millenia, to do all the dreary work machines can do better".⁵

My conclusion, therefore, is simple. The day will come for all of us when we find that our volume of holdings and rate of accessions makes imperative the substitution of new methods for old, in order simply to keep our heads above water. In such an event, should the solution lie in automation, it seems to me that it will be potentially more damaging to our dignity not to automate than to do so.

FOOTNOTES

1. Findings of the President's Research Committee on Social Trends, vol. I, p. xxvii, cited in Samuel Eliot Morison and Henry Steele Commager, The Growth of the American Republic (Oxford University Press, 1937), vol. II, pp. 130-131.
2. Walter Buckingham, Automation, Its Impact on Business and People (Mentor, 1964), pp. 14 and 18.
3. Elizabeth B. Wood, "From the Information Soapbox: Information Handling Dialectically Considered", American Archivist, vol. XXX, no. 2 (April, 1967), p. 313.
4. Sir Leon Bagrit, The Age of Automation; the B.B.C. Reith Lectures 1964 (London: Weidenfeld and Nicolson, 1965), p. 13. 5. Peter Drucker, "The Promise of Automation," Harper's Magazine, (April, 1955).