
Computers and Clerics

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articles on computers and theological
questions.*

ASKED TO WRITE something on the recent use of a computer to 'test' the authenticity of Pauline Epistles, I found myself wondering what a layman could say to theologians on the matter to fill more than a column. I venture therefore to enlarge the scope of this article to cover the wider area in which it seems likely that computers may soon find themselves under the scrutiny of the pulpit, if they lie not there already.

LITERARY ANALYSIS

Let us begin with the much publicized efforts of the Rev. A. Q. Morton and his collaborators. It might be an understatement to say that the presentation of his results in *The Observer* and his subsequent defence of them showed some lack of scientific objectivity, as well as of Christian charity to those who questioned his interpretation of them. But to one who takes computers at their face value the near-tragedy of the affair was not that these devices had found their way into such sacred preserves, but rather (with apologies to Mr Morton) that they had had such a splenetic introduction as to rob them of the welcome they deserved.

Applied to the statistical analysis of

biblical text, a computer is no more than a God-sent labour-saving device, able to perform in seconds or minutes the kinds of laborious calculation that scholars (of any persuasion) recognize as legitimate and potentially valuable, but which could never before have been completed in a lifetime. It is greatly to be hoped that those who recognize the authority of Scripture as God-given will soon be among the foremost in exploiting this new way of increasing our understanding of its composition.

What then can be established by such statistical methods? Basically, they make explicit the habits of sentence formation and choice of words which are exemplified in the document under analysis. Many writers, if left to themselves, show a fairly stable pattern of preference in such matters, which can be detected only after totting up material from thousands of word-samples. One can choose among a vast number of criteria for evaluation. Not only the relative frequency of favourite words, but more abstruse things like the frequency with which words such as 'but' or 'and' appear at particular locations in a sentence, may prove diagnostic of a certain author at a certain time — if one's sample is long enough.

The difficulty here is twofold. First, if the total available sample is small (as in a short letter) the risk of being deceived by statistical accidents cannot be eliminated by any amount of computing. Secondly, the similarity or dissimilarity one finds between two samples

of text may be affected crucially by one's choice of criteria. The temptation to indulge in wishful thinking here can be very great, unless one is fully alive to the subtleties of statistical evaluation — or even if so.

Clearly, as soon as a writer is expressing the ideas of someone else, we are likely to find the impress of the new personality on his choice of words — if we know how to look. In the extreme case of strict dictation, of course, the word-statistics should reflect the habits of the originator rather than the writer — though even here we should not neglect the possibility that the choice of scribe might react in subtle ways upon the author's choice of words. In a less rigid relationship between author and writer, the statistical picture presented by text expressing the ideas of one and the same author should show a variability indicative of the degree of freedom allowed to his different amanuenses.

If then two documents, which have claims on other grounds to common authorship, show statistically significant variations in word-frequencies, the first question raised by this is not one of their authenticity, but of the nature of the link between author and scribe. With letters written at different times under various stressful circumstances to different foreign communities, there is the further question whether the statistical pattern of the author himself would be as stable as that of a non-traveller who enjoyed a relatively unruffled existence.

It is not impossible that further comparative studies among ancient writings should enable intelligent guesses to be made on such matters. There is much scope here for computer studies by open-minded scholars with less blatant intentions to grind theological axes. The important thing is to realize both the scope and the limitations of these statistical techniques, especially when applied to short documents. Always the scientist's question has to be, 'How often would I have expected these differences (or resemblances) to turn up even if my hypothesis were wrong?' It is in honestly answering this question that he may most need the help of critical colleagues.

ARTIFICIAL INTELLIGENCE

Numerical hackwork of the foregoing order represent perhaps the lowest grade in the scale of 'artificial intelligence'. The next generation of computers are likely to tempt pulpit comment by more spectacular performances. Already a universal computing machine can be pro-

grammed not only to perform routine calculations, but also to find proofs of geometrical theorems, play original (and victorious) games of draughts against human champions, and indeed when equipped with adequate sense organs, to replace men in a wide range of actively 'intelligent' functions.

The temptations here may be to 'defend human dignity' by searching for 'something you can never get a computer to do'. But this would be a blunder; for as soon as a specification has been written down in precise logical terms, that same specification can in principle be used to programme a general-purpose computing machine to meet it.

The real difficulty lies not in the imitation of human performance once it has been specified, but in the framing of any *exhaustive* specification, in purely behavioural terms, of 'what it is to be a man'. The barrier here is not mechanical, but conceptual; and it is one which no development in the powers of computers can remove. Always we shall be left with the unresolvable question whether some vital aspect of the specification has never occurred to us, because (being only men ourselves) the conception of it escapes our mental capacity.

An important philosophical point often overlooked is that it is not ideas, but tokens for ideas, that computers are designed to handle. The same can be said, for that matter, of the nerve cells of the human brain itself. It is not brains, but people, who think. The common claim that 'computers think' is not so much a falsehood as a solecism.

All this, of course, does nothing to foreclose the possibility *in principle* that a suitably-designed artificial organism might 'embody' a conscious personality in the same sense that our brains do. However absurdly beyond our practical resources, this would seem to be something which both philosophy and Scripture simply leave open, and on which pontification is therefore out of place. The *creation* of man, which is the divine prerogative, must not be confused with the *reproduction* of his kind, whether by natural or artificial means. What is eternally significant about a man is not the physical mechanism by which his body came into being, nor the stuff of which it is made, but the nature of the personality that is expressed in and through it. The mystery of our human nature is not eliminated by any mechanical explanation of our bodily organization; so its dignity need not be defended

by any attempt to prove *a priori* that human bodily organization could not be reproduced artificially. All such empirical questions we can peacefully leave to settle themselves.

In summary, then, I am suggesting that any anti-Christian aura surrounding the powers of computers, now or in future, must derive from and reflect only the prejudices of particular users. Christians must be prepared to call the bluff of anyone who represents these powers as in themselves an embarrassment to biblical faith; for from a biblical standpoint our greatest mistake would be to neglect to exploit them to the full for legitimate ends, 'with thanksgiving'.

Note: Some of the issues raised briefly here have been discussed more fully in

the following papers by Professor Mackay:

- 'Mentality in Machines', *Proc. Aristot. Soc. Suppt.* XXVI, 61-86 (1952).
- 'From Mechanism to Mind', *Trans. Vict. Inst.*, 85, 17-32 (1953).
- 'On Comparing the Brain with Machines', *The Advancement of Science*, 40, 402-406 (March 1954); also *American Scientist*, 42, 261-268, (1954); and *Ann. Report of Smithsonian Inst.*, 231-240 (1954).
- 'Complementarity II', *Aristotelian Soc. Suppt.*, 32, 105-122 (1958).
- 'Man as a Mechanism', *Faith and Thought*, 91, 145-157 (1960).
- 'Information Theory in the Study of Man' in *Readings in Psychology* (John Cohen, ed.), 214-235, Allen & Unwin, 1964.