

A similar analysis for the Concordance Method is rather difficult to carry out. The comparison of text letter sequences with fragment lines, which occupies the time of the Partial Concordance Method, is of course completely avoided, but it is necessary to construct a concordance having as many entries as there are letters in the text. For a text of  $10^5$  letters, this is a very sizeable operation and, in the author's experience, it would take rather longer than the Partial Concordance Method.

The Concordance Method, however, has one special feature of merit: the concordance of letter sequences, whose construction takes up nearly all the processing

time, is independent of the set of fragments given. The same concordance will therefore serve again if this text is to be searched for further sets of fragments. Now a high proportion of all the sets of fragments discovered derive from a few works only (notably certain sections of the Old and New Testaments). For these works it would be worthwhile to use the Concordance Method, and to retain on magnetic tape, or print, the letter sequence concordance. Thereafter, any further sets of fragments from these texts could be located either by a relatively fast search program, or by human reference to the printed version.

## References

- BOOTH, A. D., BRANDWOOD, L., and CLEAVE, J. P. (1958). *Mechanical Resolution of Linguistic Problems*, Butterworths, London.  
COLIN, A. J. T. (1960). "The automatic construction of a glossary," *Information and Control*, Vol. 3, p. 211.  
LEVISON, M. (1964). "The computer and its role in literary studies," *Bulletin of Institute of Classical Studies*, London, No. 11, p. 65.

## Book Reviews

*Irascible Genius*, by MABOTH MOSELEY, 1964; 287 pages. (London: Hutchinson and Co. Ltd., 30s.).

Although Charles Babbage is referred to in the historical introductions of a number of books about Computers, his scientific influence in the 19th century is largely unknown today. This fact, and the entertaining reading it gives us, well merit the publication of Miss Moseley's book.

The book is very well reviewed in its own foreword by Dr. B. V. Bowden. I would offer only one word of criticism. Lady Lovelace appears to me much more as a real person than Babbage does. It is hard to decide whether this results from a more extrovert nature shown in her letters, or from the sympathy of a woman (Miss Moseley) for a woman. I suspect it is some of each.

The present struggle for survival of the British Computer industry adds a note of topicality to the book and makes Babbage's frustrations of a century ago seem more poignant.

R. J. ORD-SMITH

*An Introduction to Cybernetics*, by W. ROSS ASHBY, 1964; 295 pages. (London: Methuen and Co. Ltd., 12s. 6d.)

Dr. Ashby starts his preface "Many workers in the biological sciences . . . are interested in cybernetics and would like to apply its methods and techniques to their own speciality." He goes on to say that these people are often prevented from taking up the subject, since they feel it needs much knowledge both of mathematics and electronics. But he feels cybernetics can be understood by any one if put over in the right way. He has attempted to do just that—and in my view has succeeded excellently.

*Cybernetics*, far from being the U-word it was is now often looked upon as the signature of the non-expert. Dr. Ashby is principally known, of course, as a distinguished medical man, an expert on the brain, but he has for many years been interested in cybernetics, and has thought deeply about it. All this is reflected in *An Introduction to Cyber-*

*netics*. From one point of view it is certainly not a book for the expert who could, if super-critical, find much to criticise. But any expert willing to come off this arrogant perch will find much of value in it. Dr. Ashby looks at many things in a way that is both refreshing and stimulating.

One can never be quite sure just what ground will be covered by such a book. The following are a number of relevant words, in the order they occur, taken from the author's list of contents:

Transformation, the determinate machine; vectors; the machine with input; coupling systems; feedback; the very large system; stability; isomorphic machine; the incompletely observable box; constraint; variety in machines; transmission through a channel; the Markov chain; entropy; noise; survival; control; the error-controlled regulator; regulating the very large system; amplifying intelligence. In a number of places in the book Dr. Ashby goes quite deeply into matters such as set theory, function theory and information theory—yet he finds it necessary to explain at considerable length how it comes to pass that Shannon's measure of entropy is

$$-\sum_{r=1}^n Pr \log_r \text{ whilst Wiener's "amount of Information" is } +\sum_{r=1}^n Pr \log_r.$$

Dr. Ashby mentions error-correcting codes, but does not go into any detail on how to design them. He discusses stability, but says nothing which would give practical help to the engineer who is struggling with an unstable control system.

Too many books and many papers published by learned societies present trivial ideas dressed up with unnecessary mathematical jargon in such a way that they look most impressive—and become almost impossible to understand. Dr. Ashby presents complex ideas in such a way that any reasonable person can understand them, and maybe it is because of this he has to throw away a certain amount of rigour and precision. I enjoyed reading the book and learnt from it.

E. A. NEWMAN