REFERENCES

BROOKER, R. A. (1958). "The Autocode Programs developed for the Manchester University Computers," *The Computer Journal*, Vol. 1, p. 15.

BROOKER, R. A. (1958). "Further Autocode Facilities for the Manchester (Mercury) Computer," *The Computer Journal*, Vol. 1, p. 124.

BROOKER, R. A. (1959). "Mercury Autocode: Additional Notes," *The Computer Journal*, Vol. 2, No. 1, April 1959, p. xi.

BROOKER, R. A. RICHARDS, B., BERG, E., and KERR, R. (1959). "The Manchester Mercury Autocode System," The Computing Machine Laboratory, University of Manchester, May 1959.

ROBERTSON, H. (1957). "Cyclic Use of the High-Speed Store," *C.E.R.N. Report* (European Organization for Nuclear Research, Geneva).

GOLDSTINE, H. H., MURRAY, F. J., and VON NEUMANN (1959). "The Jacobi Method for Real Symmetric Matrices," *J. Assoc. Comp. Mach.*, Vol. 6, p. 59.

WILKINSON, J. H. (1953). "Linear Algebra on the Pilot A.C.E.," *Proceedings* of a Symposium held at the National Physical Laboratory, March 1953. London, H.M.S.O., 1954.

Book Review

Proceedings of the Canadian Conference for Computing and Data Processing. 383 pages. (Toronto: University Press, $5.00; London: Oxford University Press, 40s. 0d.)

The first Canadian Computing Conference, held at the University of Toronto in June 1958, was organized largely on the initiative of the Toronto University Computation Centre. Its object was, apparently, to review developments in the Canadian computing field, since the Centre was established a decade ago, and to give some picture of the current situation. The degree to which the Conference succeeded may be judged from these the published Proceedings.

There are several informative and interesting papers on data processing in banking, life insurance, the National and C.P. Railways, the Ontario Highways Department, the Government Service and the aircraft and oil industries. There is a paper on the application of computers to Canadian business forecasting, which summarizes "improvements in statistical theory that have stemmed from computer application," for example in recognizing the inadequacy of the twelve-month moving average; and there is an after-dinner address by the Deputy Minister of Economics of the Ontario Government, who expressed the hope that "by taking more of the guess work out of business economic dislocations may be discerned sooner and corrective action taken in time."

It is, however, a little difficult to understand why it was necessary to include a number of contributions, which, while competent in a condensed way, are essentially introductory in character (e.g. "Fundamentals of Computers," "Elements of Programming," "Character Representation and Storage," etc.), alongside others of greater interest and of a much more restricted and technical character, dealing with systems optimization, multiple and orthogonal regression, self-consistent field theory, crystal structure, and large-scale matrix calculations. Especially incongruous is a blatant sales-talk type of paper on the Burroughs E 101, which contrasts strongly with a useful survey of the problems of high-speed printing and two informative papers on automatic programming, one from Remington Rand, the other from I.B.M.

Probably the "registrants" included both those with considerable computer experience and others attending to find out "what it's all about." This is always a problem confronting the organizers of general conferences on computing, although it may be partially overcome by running parallel sessions. The solution is, maybe, to limit conferences to relatively restricted topics and to run information lecture courses for potential users and others wanting a less specialized approach.

There is a further disadvantage of such "all-in" conferences: often even the most informative and more original contributions are forced to be somewhat sketchy and less detailed than one could wish them to be. It is very aggravating to be told that such and such a procedure was successfully programmed but to be given little or nothing of the problems and difficulties encountered or of the program itself. And, of course, there is the inevitable danger of repetition. Although it is difficult completely to avoid this in any actual conference, there is much to be said for some judicious sub-editing, on the one hand, and expansion on the other, in the published reports.

One feature of the Toronto Conference must be stressed: the very clear fact that the University there is well aware of its responsibility not merely to train analysts, programmers and computer engineers, but also to "study the theoretical ideas that are relevant to a broad understanding of the whole business" (W. H. Watson, "On learning to do better.") In this connection, the paper on Computer Education in Canadian Universities is of considerable interest. Here an attempt is made to assess Canada's computer manpower requirements for 1960 and the probable student output from which they will be, partially, met—"our present curricula and enrolments are extremely inadequate and will require drastic improvements." It would be of interest to know whether a serious and comprehensive survey of the position in the U.K. has ever been attempted or even contemplated. It would also be interesting to ascertain to what extent the development of numerical automation is influencing the curricula of our own universities and major technical colleges.

Throughout the Proceedings the influence of the U.S.A. is, as one might expect, strongly evident. It is, however, pertinent to point out that the British contribution to computer science is by no means negligible. Indeed, one has the impression, from time to time reading this volume, that it would be helpful all round if more systematic information about British work and achievements in all fields of the science were made available to our Canadian colleagues. We on our side are grateful for this volume both as a useful survey of the Canadian computing scene and as a non-academic introduction to computer science and some of its applications.

R. GOODMAN.