PROCEEDINGS OF THE BIOCHEMICAL SOCIETY

The 508th Meeting of the Society was held at the Agricultural Research Council Food Research Institute, Colney Lane, Norwich, on Monday and Tuesday, 28 and 29 September 1970, when the following papers were presented:

COLLOQUIUM ON 'ON-LINE COMPUTING'

On-Line Computing in the Ambience of the Edinburgh Multi-Access Project

By J. H. OTTAWAY. (*Department of Biochemistry, Medical School, University of Edinburgh, Teviot Place, Edinburgh EH8 9AG, U.K.*)

On-line computing is defined (Tootill & Wilde, 1968) as a relationship between a computer and another unit of equipment in which one unit can be controlled by the other without human intervention. This control can take many forms, as in the two-way relationship between a computer and a remote-access terminal (teletypewriter), or the one-way control of a display device: the one-way collection of data by a computer as signals are output by laboratory equipment, or the two-way interaction in which the performance of the laboratory instrument is adjusted as a result of information elicited from earlier signals.

As an introduction to the Colloquium, some of the possibilities and limitations of such techniques will be discussed with reference to the Edinburgh Multi-Access Project. This was designed to provide on-line computing for the second-largest University in the U.K., two major Research Institutes and other smaller ones, and at least partial computing facilities for three other Universities in the East of Scotland.

Tootill, G. C. & Wilde, A. R. (Eds.) (1968). *IFIP-ICC Vocabulary of Information Processing*. Amsterdam: North-Holland Publishing Co.

Shared Real-Time Access to a Small Computer

By C. FAY and S. HAYES. (*Department of Natural Philosophy, University of Edinburgh, Drummond Street, Edinburgh EH16 5HJ, U.K.*)

Why think of using a computer? A good reason is because automatic-control and data-acquisition systems with fixed programs are so costly that a group of potential users should consider pooling resources towards the cost of a small computer with links to their experiments. There are many small computers on the market suitable for interfacing to

on-line experiments, and with sophisticated programming they can control a number of experiments simultaneously without cross-interference. Such a system has been set up at the Department of Natural Philosophy, University of Edinburgh. It consists of a PDP-8 computer with an 8K core store, presently interfaced to three experiments, namely: (a) wind-tunnel control and data acquisition; (b) sophisticated pulse-height analysis (C. Fay); (c) high-energy-particle track measurements and control.

The computer may simultaneously be used for analysis of results, using Real arithmetic if needed. A compiler (S. Hayes), which runs on the large computer, greatly simplifies the task of writing large experimental or analysis programs.

The supervisor program (S. Hayes) shares out the resources of the system. It enables user programs to run apparently simultaneously, and efficiently handles input/output. This involves handling program interrupts, buffering medium-speed devices and allocating shared peripherals. DEC-tape is used for data storage. A file system enables several users to share the same tape. Programs may consist of several segments, each called off a library tape when needed.

The smooth running of the system depends very much on its administration, the minimum number of personnel being a competent technician, a competent programmer (possibly a computer-oriented research student) and a secretary/programmer, apart from an overall head of unit. Most companies will assist in the training of a technician in the techniques of interfacing and programming. Firms who supply the apparatus linking the experiment to the computer will often supply the interfacing, at extra cost. Service contracts for maintenance should be arranged.

Similar applications of the small computer have been developed for hospital information systems, chemical-laboratory instrument data acquisition and control, oceanographic data acquisition and even monitoring the behaviour of hens.