

THE INFORMATION EXPLOSION

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SCIENTIFIC and engineering research throughout the world costs the equivalent of billions of pounds. This expenditure creates information. The volume of books, periodicals, reports, manuals and other publications is exploding. Money and research can be dissipated on experiments which have been done already, perhaps in a neighbouring laboratory, if those who need the answer to a question cannot determine if the question has been answered previously, and if it has been, where the answer is reported. One statistic should be enough to stress the problem's magnitude. Two million scientific and technical articles are published annually throughout the world. To find out what is known about some technical matter can be expensive; but it can obviate experiments of still greater cost and bring financial returns of even greater extent. The time-factor can be vital in medicine, commerce and defence. The value of information is recognized in the United States and in the U.S.S.R. In the United States several hundred million dollars are now spent annually on the information flow, and while the rouble expenditure on corresponding activities may not be publicized so widely, it is certain that the U.S.S.R. has deployed considerable talent and effort on this problem.

Some of the methods that are being used by the engineering community in the United States to deal with the information explosion were described in London during June 29–July 2 by Mr. Bart Holm of the Du Pont Corporation. He spoke to various audiences of research managers, engineering personnel and technical information officers at the request of the Institution of Chemical Engineers, who must be congratulated for organizing the meeting. Mr. Holm gave to these three audiences a virtuoso performance of theme and variations—the polished product of an environment in which things get done, enthusiastically, with ample financial support, in the context of a technology that is advancing on every front.

I returned recently from the United States, and I find the Transatlantic contrasts in this as in other fields rather striking. In the United States, the problem of the information explosion has formed the subject of a report of the President's Science Advisory Committee. Congressional committees are aware of the problem, and even if individual politicians may seem to use particular suggested solutions as cases which it may be expedient to support, their efforts contribute to a forward-going movement, in which the pluralistic structure of American society ensures that all good ideas get ample airing. The Defense Department,

the National Institutes of Health and National Library of Medicine and the National Science Foundation maintain extensive information collection, cataloguing and reporting projects, and support many more in universities and industry.

The technical problems which are relevant to this work are very diverse. Library design and operation form ample subjects for study by the methods of operational research, and for mechanization by computers and by special purpose equipment. Improving the standard of technical presentation needs increased attention by schools and colleges. Full-time technical writers are in the ascendancy in many quarters. The literature is swollen not just by the desire to communicate information that its producer thinks is useful. Ego satisfaction, academic promotion, grantsmanship and managerial competition contribute to the volume of both the published literature of books and journals and the sub-literature of reports and memoranda. High quality and elaborated typewriters, multilith machines and, in the offing, phototypesetting (with or without the computer's aid) increase the ease and quality with which in-house documents can be produced. Indexing, abstracting and cataloguing the literature for current awareness and for subsequent literature searches occupies many highly trained personnel, and is itself the subject of extensive research. Computers are being used as powerful aids in some of the routine clerical chores associated with such work, though attempts to use computers to do the actual indexing do not seem to hold out much promise for the near future. Computers are being used to obtain lists of citations to material that has been indexed, and which is sought by specification of index terms. Documents once identified are obtained for use in various ways, including copying of full-size originals, microfilm viewing and preparing full-size copies from microfilm. Still further types of information processing machine are on the horizon.

Educational programmes are being developed to train personnel in the new techniques of information handling. Some of the efforts to secure professional status for this new field of endeavour tend to weaken the case rather than to strengthen it. As in other newly developing fields, a considerable amount of material is produced which is rather weak. There is to some extent a repetition of the social scientist's practice of creating excessive jargon. By and large, however, the picture in the United States is one of general progress in information science that is being helped by, and in turn helps, the general advance of a dynamic technology.

ADVANCEMENT IN COKE TECHNOLOGY

THE twentieth annual report of the British Coke Research Association has been issued recently, shortly after the publication of a special report on work carried out at the Coke Research Centre, Chesterfield, during the five-year period since it was opened by the Duke of Edinburgh. During this time, the Centre has been widely recognized throughout the world as an established authority in its field. This comprises a wide range of research activity from studies of atomic structure to commercial scale operations. Indeed, the Association had its origins very much prior to the Second World War in two research committees, namely, the Midland Coke Research Committee operating in the Department of Fuel Technology of the University of Sheffield, and the

Northern Coke Research Committee, still in being, which has always operated from research laboratories associated with the Chemistry Department of King's College, Newcastle (now the University of Newcastle). The latest reports of the Association describe full-scale production work on the 10-ton oven at Chesterfield, as well as investigations at the plants of member organizations. The record over the years is thus truly an achievement in the union of science and practice.

Advances in coke technology must have an important bearing not only on the iron-making industry but also on domestic and other industrial needs, for the technical possibilities of the application to any given requirement of solid, liquid or gaseous fuel are always present. Im-