

provide a magnificent variety of all things from the profoundly philosophic through the simply utilitarian to the distinctly risible. It is sometimes difficult to distinguish (if one wishes or ought to) between the first and last of these. Take, for example, the following exchange in the discussion reports concerning the direction of time.

D. Park—(Massachusetts, USA)—It seems that we get our sense of time direction very much more from the radiation of the Sun . . . than from anything the Universe is doing. Why on Earth should non-radiative living processes be bound up with the ultimate fate of radiation? This is not clear in Landsberg's statement, but Narlikar has his own answer. According to it, if suddenly the Universe started to contract, then it would seem to us that, as a result of distant events, the Sun would start re-absorbing radiation.

Landsberg—It would seem so to God, not to living things. God would say, ah, the Universe is contracting and everybody is getting younger while, I, God, am getting older.

Costa de Beauregard—No! Eternity is time-extended!

Landsberg—*Mon Dieu* (laughter)! I didn't really mean God.

What shall our undergraduates, struggling grimly uphill on their Carnot cycles, make of this? It was not, of course, a conference for undergraduates, but that is a legitimate question, and the answer is, I hope, that they should make much—in the sense that these are the sort of deep philosophical problems that stimulate people to study physics—at least they provided one of my own major motivations and I do not think, in spite of appearances, that things are so very much different now, fundamentally. It is a pity that the glamour of particle physics and expensive accelerators, and the hubris apparently inevitably engendered in some of their adherents, have distracted attention from the equally—or more—fundamental questions raised by less expensive disciplines. It is also anomalous (in a rational, not a political) sense in this age of relevance: a good deal of the work of this conference might well have application in industry and elsewhere now and in the foreseeable future.

Rather few reports of conference proceedings have more than a transient appeal, as a collection of papers of current interest in a special field. This is surely one of them, which should be widely used and be of lasting value. The section on foundations is perhaps difficult and esoteric and will be read mostly by thermodynamicists, but there is wide interest in, for example, phase transitions and surfaces. There are papers on the theory of fading memory, irreversibility and quantum mechanics,

astrophysics and relativity. There are papers and discussions on the teaching of thermodynamics. It is impossible to get an adequate idea of the scope and balance of the book, however, without examining it, which I very strongly recommend.

It seems a pity to carp, but I must say that this book is so valuable that an index would have been well worthwhile. It might have enabled me to detect some reference to information theory, which has so far escaped me. One other omission is the thermodynamics of finite systems. This state of matter, intermediate between non-interacting single-particle behaviour and the infinite thermodynamic limit, is surely of fundamental interest. It concerns, for example, nuclear matter, polymers, macromolecules and many biological systems, and could lead to a radical re-assessment of our understanding. Not much is known experimentally in this area, but there is an awakening interest in the properties of small assemblies of particles, and this may well be a useful addition in a future conference.

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Information Science

Introduction to Science-Information Work. By C. W. Hanson. Pp. 199. (Aslib: London, June 1971.) £3; members £2.40.

ALTHOUGH information science has been developing rapidly during the past twenty years, and education in the field has been offered in the past ten years, there are still no definitive textbooks. It is a pity, therefore, that Mr Hanson, after his long pioneering experience at the British Scientific Instrument Research Association and at Aslib, as head of research, should now present a book on the mixed objectives of "information, documentation and library work" and called "science-information work". Information science is largely recognized as distinct from librarianship; in Great Britain, the term covers both practical and theoretical aspects, so that the expropriation of the term in the United States for theoretical studies of the science of information is not sufficient justification for abandoning it in Britain. Furthermore, information science is now extending into non-scientific fields, so that it is not just science-information. It was Mr Hanson who suggested the title "information scientist" in 1957.

Even as an "introduction" the book is quite elementary in content, although what it covers is most lucidly, carefully, and thoroughly described. It is in five parts. The first part deals with the problems of communication and the flow of information, the growth of the literature and the media of communica-

tion. The second part describes the primary and secondary types of literature, and non-documentary sources of information—organizations and people—a much-needed reminder in these days of mechanized services. There is then a rather short adumbration of mechanization, information retrieval and selective dissemination of information, all in a very general manner and in only seven pages. The fourth part discusses the provision of information to enquirers and users, and the making of searches for such information. Finally, there is some account of library operations, including lending, reprography and microforms in relation to information services; mechanized methods of library housekeeping are also considered. A short appendix gives attention to aspects of writing, editing, printing, publishing, translating and public relations.

In general, the book is centred on conditions in the United Kingdom, and foreign literature and sources of information are given scant attention. There is much sound commonsense in the advice given, but there are some unexpected flaws. The production of abstracts bulletins within industrial firms and research associations is not described. Patents are dismissed as unimportant as sources of information, although they frequently describe research which may not achieve wider publication for several years. To suggest that *International Critical Tables* (1927) is the last publication of its kind is too insular and ignores many excellent foreign publications.

The book is specifically addressed to school leavers, undergraduates and even older unqualified people, although information science is rapidly becoming a fully graduate profession. It deals too much with routine matters and makes the work seem rather a pedestrian activity. This is a pity, because the principal attractions of information science are the wide variety of tasks, the breadth of knowledge to be covered by keeping up to date and in touch with current research, and the contacts with people, from the factory floor to management. Increasingly there are opportunities to develop advanced computer-based systems, and there is a growing field of research in information science itself. Useful though this book may be at basic routine practical levels, it lacks the enthusiasm and the intimations of advanced work and problems which will inspire new entrants to the profession. Information departments, handling both technical information and management information, may well become the essential nerve centres of industry in the future. In the absence of the much needed advanced textbooks, even an "introduction" should point out, boldly, the way ahead.

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