

tion. The treatment of the thermodynamics of surfaces is original and a marked advance on previous treatments.

Naturally much of the material presented has been well known for a long time, but Prof. Guggenheim imparts his own clarity and individual flavour to the argument everywhere; and his comments on commonly used methods and conceptions are always illuminating, often critical, and sometimes pointedly disapproving. He considers the time-honoured practice of using "heat of reaction" to denote the heat given out in a reaction "deplorable"; but many may think that the old sign convention, by which the heat of combustion of coal, or heat of fission of uranium, are large positive quantities, should not be abandoned merely to make the symbol for heat of reaction  $\Delta H$  instead of  $-\Delta H$ .

There are several changes since the first edition, mostly in the treatment of solutions. Solutions with many components are discussed along with two-component solutions, instead of in a separate chapter. Prominence is now given to Scatchard's 'excess functions' as an alternative to activity coefficients or an osmotic coefficient, for expressing the deviation from ideality of solutions. The osmotic coefficient  $\phi$ , used in this edition, is not identical with the osmotic coefficient  $g$  used formerly, although it becomes equal to  $g$  at great dilution. The author has apparently abandoned the use of an osmotic coefficient except for very dilute solutions, which seems a pity. Following Hildebrand's desire to restrict the term 'regular' solutions to those where the entropy change on mixing is that for ideal solutions, a new term, 'simple' solutions, has been introduced to describe most of those called 'regular' in the earlier edition; and the existence of truly regular solutions, apart from ideal solutions, is now challenged. The rather unexpressive term 'degree of advancement' has been changed to the clearer 'extent of reaction'. There is a new chapter on Onsager's reciprocal relations.

Though the book deals mainly with classical thermodynamics, the results of statistical thermodynamics are frequently used, though often only an outline of the statistical argument is given. The book is thoroughly up to date and authoritative, and the thought-provoking challenges frequently thrown out to customary conceptions and methods which may lack precision are salutary, even though not all the criticisms will necessarily be accepted as valid.

N. K. ADAM

## DOCUMENTATION AND DISSEMINATION OF INFORMATION

### Documentation in Action

By Jesse H. Shera, Allen Kent and James W. Perry. (Based on the 1956 Conference on Documentation, at Western Reserve University.) Pp. xv+471. (New York: Reinhold Publishing Corporation; London: Chapman and Hall, Ltd., 1956.) 80s. net.

AS the sub-title suggests, this book is based on a symposium on documentation, but the implications of the subject may not be very clear to potential readers, particularly those on the eastern side of the Atlantic. The purpose of the book is to promote the widest possible dissemination of information. The method is to discuss in original articles and programmes existing and envisaged systems and

equipment for storing, classifying and correlating recorded material with the view of ensuring its maximum availability and therefore potential value.

As J. H. Shera points out in the introduction, "The world of thought (scholarship) and the world of action have always been interdependent", and this means that to provide for an efficient human society we require to build up an efficient scheme of communications. At the present time with the rapid increase of knowledge, and even more rapid increase of the volume of publications, this need is becoming even more imperative than before. The newly emerging science, dealing with the organization of human knowledge, which has not as yet received a distinctive name, includes a very large number of departmental aspects, such as linguistics, semantics, logics, philosophy, principles of classification, library organization, card systems and recording and calculating machines, organization of scientific societies and scientific and technical publications, abstracting and reviewing services, book production and many other matters. In the words of J. H. Shera: "The new discipline that we here envisage, and which for want of a better name we have called 'social epistemology', will provide a framework for the effective investigation of the whole complex problem of the intellectual processes of society—a study by which society as a whole seeks to achieve a perceptive or understanding relation to the total environment. It will lift the study of intellectual life from that of the individual to an inquiry into the means by which a society, nation, or culture achieves an understanding relationship with the totality of the environment, and its focus will be upon the production, flow, integration, and consumption of all forms of communication throughout the entire social pattern. From such a discipline should emerge a new body of knowledge about, and a new synthesis of the interaction between, knowledge and social activity".

The book consists of a number of original articles as well as discussions and co-operative programmes. Part 1 contains seven articles on documentation terminology, co-operative information processing, logic of research, librarianship, methods of storage and retrieval of information and on the use of information. Part 2 contains programmes for the future on the utilization of recorded knowledge, with six articles on abstracting, librarianship, and the role of language in the communication of recorded information. Part 3 contains seventeen discussions of the subjects raised in the articles. Part 4 contains five co-operative programmes, called 'co-operative information processing', for branches of science dealing with metals, pharmaceuticals, petroleum, documentation as such and patents. Machine translation, programmes of Unesco and mechanisms for flow and retrieval of research information are also discussed.

The choice of terms used in this book ('processing', 'project', 'language engineering' and the verb 'to programme') brings us into close contact with the American vitality of language and action; but this need not deter the scientist, or engineer, or anyone dealing with organized knowledge or administration from studying this book.

The problems it tackles are the outcome of the enormous increase in the rate of production in knowledge and the imperative necessity for utilizing it in the service of human society by developing efficient systems of 'communication'.

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