

By the 1970s it is no longer possible to give an adequate treatment even within two such volumes. Quite apart from the natural spread of applications, major new instrumental developments continue to surprise us, such as the scanning transmission microscope, and new insights into image formation have allowed the heavier atoms to be "photographed". In this situation only a collaborative effort by a group of experts can do justice to the subject. A German scheme breaks it down into many small sections, which appear seriatim as each text is completed, to be bound in loose-leaf form (*Methodensammlung der Elektronenmikroskopie*, Wissenschaftliche Verlagsgesellschaft, Stuttgart; 1971).

An English enterprise in rather different form has now been launched, edited appropriately by a physicist now researching in a biological laboratory. Dr Glauert is assembling a team of authors to provide a "comprehensive series of laboratory handbooks in which all the techniques of electron microscopy are described in sufficient detail to enable the isolated worker to carry them out successfully". The first volume certainly lives up to this aim. It has two parts, the first of which deals with specimen preparation in materials science. The chief preparative techniques for metals and other solid samples, including powders and fibres, are described by Dr P. J. Goodhew in 189 pages. Part 2 is in two sections, an introduction to electron diffraction by Dr B. E. P. Beeston (140 pages), followed by an account of the application of optical diffraction and image reconstruction techniques to electron microscopy by Professor R. W. Horne and Professor R. Markham (110 pages).

In selecting the authors the editor has obviously followed the rule enunciated in her preface that "it is not possible to describe a technique with sufficient practical detail for it to be followed accurately unless one is familiar with the technique oneself". Each contribution is well planned and clearly presented, starting from elementary principles and working up to the present state of the art. The text is illustrated with diagrams, charts and micrographs; references are given after each chapter and a list of suppliers of relevant equipment and materials at the end of each part. A subject index is also provided for each part, as the primary intention of the editor and publishers is for individual parts to be available in paperback form. In the same way volumes II and III are announced as each comprising two rather unrelated parts. So that what we are offered is a series of monographs, from which the advanced student or research worker can select those he needs on his work bench. The hardback edition appears to be provided

mainly for the convenience of libraries. This is an imaginative venture which deserves to succeed, if the standard of the first two parts can be maintained. It is a little disappointing, however, that the price of the first paperback parts is still relatively high (about £4 and £5.50), almost two-thirds that of the bound volume I.

V. E. COSSLETT

## Peaceful Revolution

*Management and Technology*. Edited by Alan Mencher. Volume 1. An Anglo-American exchange of views. (Inforlink: Frimley, Surrey, 1972.) £3.80.

WILL this be the "century of the mismatch", in which our technological power outstripped our strength of moral purpose, and our social institutions—designed for an earlier environment—proved unable to modify themselves quickly enough to tackle the right problems? Alan Mencher's selection from the discussions which he has so successfully organized at the US Embassy provides some answers. Blake, Ackoff, Ramo, Charpie, Schon and others—in talk and discussion with their British audience—show that the Americans have moved from the consideration of problems as isolated discrete issues to the position of studying them as part of the larger system which is their environment. They still lack the tools, concepts and experience for tackling complex systems problems but the systems approach, however imperfect, does force people to set down their goals and the criteria against which proposals can be judged.

Society, by creating an increasing need for a priority selection of satisfactions, is forcing political action and together these provide new opportunities for industrial endeavour. New ideas mean change, and rapid response to change may often only be achieved by revolution. The key problem in innovative management is how to produce peaceful revolution so that every individual's competence can be fully exploited. American business has reacted by, as Schon puts it, moving from the concept of a firm producing a highly aggregated product to that of the firm conceived as an organization built around a process as its defining character. This notion can best be seen in the constellation firm, such as 3M, in which semi-autonomous firms surround a bank and a development facility. Such a firm is highly adaptive—satellites can expand, contract or be replaced. Flexibility like this in industry imposes great strains on other institutions, particularly in research and education. These have to adapt to a faster internal rate of change, so that they meet more readily the real

and continuing needs of firms and individuals alike.

One mis-match is very noticeable in this series of papers. These American notions of management have moved well ahead of ours. A contribution from a representative of one of America's besieged or decaying industries would have introduced an interesting counter-balance, for not all would agree that rapid change is necessary or desirable. As we move closer into the European community, the clash of cultures in the problems of reconciling social and technological developments will become more devastating in their effect. The Americans have the advantage of being able to experiment on a larger scale than we can afford. Their search for solutions, as revealed in these papers, provides a valuable starting point for those of us who are beginning to recognize the nature of the changes in industry, government and educational systems which will occur during the rest of this century.

E. P. HAWTHORNE

## Molecular Concepts

*Atomic and Molecular Structure: The Development of Our Concepts*. By Walter J. Lehmann. Pp. xix+449. (Wiley: New York and London, July 1972.) £5.50.

THIS book represents a courageous assault upon an important problem: how to teach aspects of a highly technical and mathematical science to people without a scientific background. In this case the subject is atomic and molecular structure and the students were those reading for non-science majors at Boston. Five main sections deal respectively with developments leading up to the periodic table, the evolution of the nuclear atom, elucidation of the electronic structure of the atom, quantum mechanics and molecular structure. One imagines the liberal arts students would turn often and gratefully to the appendices on the metric system and "a quick refresher on arithmetic procedures", to say nothing of the very full glossary.

The value of Professor Lehmann's work can only be assessed in practice, but it has the marks of sound educational strategy. Little is left to chance, the text is clear and interesting, there are some useful graphics, and self-assessment questions monitor the individual's progress. There are a few mistakes in formulae, equations and calculations, but they are not likely to be serious impediments.

In place of the conventional rigorous treatment of his themes the author adopts an approach that may be fairly termed quasi-historical. There is no