packaging design. A record of the technical and other parameters on which the revised regulations were drawn up may assist in their application and will provide useful reference material in any future revision. The book fulfils both roles admirably, more particularly as the majority of persons who contributed to it are themselves experts who assisted the International Atomic Energy Agency in the revision.

Part I of the book deals with the regulations themselves and their technicalities. A good overall perspective of the increasing degree of control required as a function of the potential hazards is given in Chapter 7, which ably describes the security considerations to be given to the movement of a large radioactive source. Chapter 1 is an excellent and detailed step by step guide to the requirements of the regulations. It provides an introduction to the comprehensive technical accounts which are given in respect of the control of external radiation, requirements for fissile materials, standards for packaging design, relaxations for materials of low specific activity and the classification of radionuclides, all of which are written in a very clear and readable manner. The administrative body in the regulations is the Competent Authority, particularly important for international transport. The duties of that authority are well described and in detail in Chapter 2; it would have been useful, however, to summarize the philosophy of the regulations in respect of unilateral and multilateral approvals as a function of the availability, or otherwise, of detailed standards and criteria.

The I.A.E.A. regulations are mandatory only for the I.A.E.A.'s own operations; in all other respects they are recommendations to be used as a basis for national regulations, and to be applied in international transport. Part II provides a very useful section in which an account is given of the extent to which the recommendations have been used. It is encouraging to read how widely they have been adopted.

The provisions of the I.A.E.A. transport regulations reflect consideration of both normal and accident conditions in the transport environment. Part III of the book is a concise review of the accidents and incidents involving radioactive materials. Such discussion leads naturally to questions of insurance and indemnity against third party liability in the transport of radioactive materials. Part IV provides a clear and readable description of how such arrangements have been provided for on a European regional, and a national, basis respectively.

G. J. APPLETON

PROGRAMMING LANGUAGES

Formal Language Description Languages for Computer Programming

Edited by T. B. Steel, jun. (Proceedings of the IFIP Working Conference on Formal Language Description Languages.) Pp. 330. (Amsterdam: North-Holland Publishing Company, 1966.) 40 guilders; 80*s*.

THE conference, the proceedings of which appear in this book, marks a significant stage in the development of automatic programming languages. In the early stages of development interest was solely in the writing of compilers; as Dr. Johnson said in another context, it was not done well, but we were surprised to find it done at all. A major advance was made when it was realized that the syntax of a programming language, that is, the rules defining the sentences which can be written in the language, could be expressed formally, and that compilers could be written to work from this formal syntax, thus systematizing their construction. To define a programming language, however, it is necessary to specify not only the permissible constructions—the syntax—but also the meaning of each construction—the semantics. Hitherto, the semantics of a language have been described in an informal and often pragmatic way, the ultimate definition being the behaviour of the compiler on a particular machine. Attempts are now being made to establish methods for formally defining the meaning of programming languages, and the conference brought together almost every worker in this field at the time.

The methods proposed for formal definition of semantics fall into two broad classes. The first class comprises those methods which develop a meta-language in which to describe the meaning of the programming language. This involves the definition of a number of fundamental concepts of structures in terms of which the more complicated concepts and structures of a programme can be described. The alternative method is to define an idealized machine, often called an evaluating mechanism, and to define formally the action of the machine in response to a piece of programme. In this way the meaning of a programming language is defined by describing what the idealized machine will do when presented with a programme as an input text. The twenty papers in this volume between them cover many variations of these two broad themes. None of the papers attempts very much in the way of comparing and contrasting the various approaches, but at this stage in the development of the subject it is valuable just to have all the different ideas collected in one volume.

For this reason the book is essential reading for anyone starting work in this field, and it should find a place in the library of all computer scientists interested in programming languages.

D. W. BARRON

GETTING THE SALT OUT

Principles of Desalination

Edited by K. S. Spiegler. Pp. xiv+566. (New York: Academic Press, Inc.; London: Academic Press, Inc. (London), Ltd., 1966.) 168*s*.

SCIENTIFIC and industrial activity in the field of desalination is increasing rapidly, and this book will make a very useful introduction to the topic for those engineers and scientists who find themselves drawn into this type of work.

Although the book is well balanced as a whole, it seems clear that those authors responsible for the separate chapters must each have been given different terms of reference, for most chapters treat their topics in quite different ways. For anyone approaching the subject for the first time, the existing order of chapters would certainly not be the best. Chapter 9, on the "Preparation of Ultrapure Water", would have been a more suitable first chapter.

The concept of energy contained in the second chapter, on the theory of thermoeconomics by Evans, Crellin and Tribus, is not a concept to which an engineer can easily re-orientate after many years familiarity with energy, entropy and the normal manipulation of mass and heat balances. Examples of the use of this new parameter were given in Tribus's paper to the International Symposium on Water Desalination, where its utility was more in evidence than it is in the book.

Silvers's chapter on distillation is a very good fundamental analysis of the mechanics of distillation in large plants. Almost all desalination plants based on land or on ships are of the distillation type and one might have expected Mr. Spiegler to include a chapter on engineering design of distillation plant; perhaps, even, at the expense of the length of the excellently written chapter on vapour reheat.

Lof gives a very good account of the research work on, and the potential of, solar stills, but I cannot agree with his statement that "solar distillation occupies a favoured position among desalination processes in capacity ranges up to 50,000 or perhaps 100,000 gallons/day".