and the usefulness of the book would be enhanced for a wider readership if the control engineering notation used in many of these diagrams was more clearly explained.

So much for the exasperation. The book remains intriguing on two counts. First, the writers have applied the methods described in an interesting variety of situations which are illustrated with graphical comparisons of actual and forecast results. These examples include the end boiling point temperature of a petroleum plant, short-term forecasting of electricity demand, power station load variations, prediction of the internal pressure during brain haemorrhage, predicting the profile of a river bottom for optimal control of navigation, prediction of the amplitudes of ocean waves and prediction of atmospheric pressure. The apparent agreement is striking, but I would like to have seen a more extensive discussion of cases where the techniques proposed did not work, as there are many failures for each success in the forecasting business. Indeed, the statistician will be struck by the difficulty of establishing the significance of the results using these techniques.

Secondly, the fourth and last chapter is devoted to the use of adaptive pattern recognizing systems of the perceptron type as a forecasting aid, and evidently this is where the authors' real enthusiasm lies. They put the case for computing networks of this type in situations where such digital computing methods as discriminant analysis and clustering might otherwise be used but where digital computers may be too slow or too costly at present. The techniques proposed represent a considerable advance in sophistication on the analogue computing networks generally in use for control purposes.

C. M. BERNERS-LEE

FAST REACTORS

Fast Breeder Reactors

Edited by P. V. Evans. (Proceedings of the London Conference on Fast Breeder Reactors organized by the British Nuclear Energy Society, May 17-19, 1966.) Pp. viii+951. (Oxford, London and New York: Pergamon Press, 1967.) 240s.; \$37.

In recent years, the British Nuclear Energy Society has arranged a number of international meetings on different aspects of nuclear technology, and this thick volume forms the proceedings of the 1966 London one on fast breeder reactors. The cost of publication is always a problem to the planning committee of any unsubsidized conference; the easiest solution, and in some cases the best, is to publish nothing, but BNES is firmly in the other camp with everything presented, including the discussion, verbatim. For the London meeting, publication has been through a well known scientific house and the result is a volume with a clear and elegant format but at a price which will almost certainly exclude individual buyers. Librarians of nuclear institutions will have to budget accordingly because the volume should certainly be on their shelves. Moreover, they should bear in mind that the proceedings of the International Atomic Energy Agency's 1967 Karlsruhe meeting on fast reactor physics will soon be available; comparison will provide an interesting check on progress.

The first section of the present volume is concerned with the place of fast reactors in the energy programmes of the United Kingdom, the United States, the Euratom countries (with France also reported separately) and Japan. For the UK, Searby and Liffe of the Atomic Energy Authority consider various national atomic energy programmes for the last quarter of the present century and estimate that several hundred million pounds would be saved by the installation of fast rather than thermal reactors. They do not give the total cost involved, but from the assumed installed capacity it seems likely that

their savings would be some 10 to 20 per cent of the total. More British estimates on generating costs were given in a later session of the conference by Tattersall, Bell and Emerson, who presented the results of a design study for a $2 \times 1,000$ MW(e) fast reactor station undertaken jointly by the three British industrial consortia concerned with nuclear power. This particular session, devoted entirely to the design of fast power reactors, also included a description of the British prototype fast reactor under construction at Dounreay, as well as information from France, the United States and Russia.

One of the two Russian stations described is being built on the shores of the Caspian sea to provide electricity (150 MW) and fresh water (12,000 tons per day). Although gas and steam cooling received some attention in this session and an earlier one, the greatest design interest was in liquid metal cooling. The similarity of the separate designs was commented on by Carruthers of the English Central Electricity Generating Board, who wondered, as a potential customer, whether international collaboration could be arranged to avoid duplication of effort, either by concentration on a smaller number of prototypes or by deliberately pursuing different possibilities. Appropriately, the design session was preceded by one on operating experience with the three sodium-cooled systems, the Dounreay fast reactor and the American reactors EBRII and Enrico Fermi, which were operating at thermal powers of 50 to 70 MW at the time of the meeting and with the Russian 5 MW system. These operating reactors, and experiments in thermal ones, have provided much information on fuels and liquid sodium coolants. Two conference sessions were devoted to these topics and two others to the detailed behaviour of neutrons in fast reactors.

J. WALKER

ORGANOMETALLIC COMPOUNDS

Organometallic Compounds

Vol. 1: The Main Group Elements. By G. E. Coates and K. Wade. Third edition. Pp. xiv+573. 120s. Vol. 2: The Transition Elements. By M. L. H. Green. Third edition. Pp. xiii+376. 100s. (London: Methuen and Co., 1968.)

In the first edition of this book, published in 1956, Professor Coates gave an excellent survey of organometallic chemistry within about 200 pages of text. So rapid was the growth of this field, following the discovery of ferrocene, that a timely second edition (366 pages) appeared in 1960. Now some twelve years after publication of the first edition the much awaited third edition has been published as a two volume work comprising some 950 pages, and written by three authors. Not only has the number of pages substantially increased with each succeeding edition but so have the dimensions of the printed pages, so that the latest edition represents in terms of its size and scope a notable work indeed.

Volume 1 reviews the chemistry of the organometallic compounds of the main group metals, the term organometallic being defined, as is customary, as a compound containing a metal-carbon bond. Thus metal alkoxides and some other metal-organo compounds are excluded. As in the previous editions, compounds of boron are included, but not those of silicon or arsenic. The book has a well designed table of contents, and a detailed subject index enabling a reader to locate quickly information on a particular compound or class of compound. Some of the subject index entries seem unnecessary, for example, "dollars, millions of", while others such as "smell" lead to amusing anomalies. Thus the index carries an entry for the apricot smell of one organogallium compound but not the vanilla smell of another, both having the same acceptable fragrance for the reviewer.