miscellaneous procedures and agents; and toxicity. The author's critical review of the available data allows a detailed analysis to be made of the factors which led to the successful use of contrast medium.

There are over 400 references. An index lists details of 17 different contrast media, together with their synonyms: for clarity these lists might have been more distinctly demarcated. There are a few half-tone illustrations; these might well be omitted, since the subjects will be familiar to readers of this work. Figure 17 should be retained, but its clarity improved. The graphs are well produced and of adequate size.

Professor Knoefel has included much of his own unpublished research in this book and the work is crammed with useful information. Apart from the intentional omission of practical radiological techniques, the chief criticism will be that this work is too short. However, when a point is sought and cannot be found, it is probably because there is no reliable information on the subject. This work can be recommended.

This volume conforms with the general high standard expected from Charles C. Thomas. However, it might have a considerably wider appeal if it were less costly: perhaps this could have been achieved if matt paper and soft covers were used.

G. M. ARDRAN.

PROGRESS IN BIOPHYSICS

Progress in Biophysics and Biophysical Chemistry. Volume II. Editors: J. A. V. Butler, B. Katz, R. E. Zirkle. (Pp. 277 +v; illustrated. 75s) Oxford, London, New York, Paris: Pergamon Press. 1961.

The editors of this volume seem to have been hard pressed for material, because to supplement the six review articles the abstracts of an informal discussion on cytoplasmic particles are added as a make-weight, together with lists of contents and name indexes for the previous volumes. While this is doubtless a creditable attempt to give value for the 75s. the purchaser must spend on this volume, it might have been better to wait another year for biophysics to make the requisite progress. We must, however, give the Pergamon Press full credit for their restraint in publishing these abstracts in such a modest way.

The articles contained in this book are of high quality and some are of special medical interest. Thus Mayneord's "The Natural Radioactivity of the Human Body" describes the results of three years' painstaking analysis of the alpha-particle activity of human tissues. This activity, of course, is due to the presence of trace-elements, mainly of the radium and thorium series, largely concentrated in bone. The activity of the soft tissues is very small but measurable; where it is high, as in the eyes, the hair, and placenta, this would appear to be due to the tendency for these tissues to accumulate alkali earths, such as barium, and therefore radium. The actual activity per cell is reassuring: there is only one atom of radium per 200 cells, which means a chance of a single disintegration once in 800,000 years.

The article by Lajtha on the effects of ionizing radiations and tumour-chemotherapeutic agents on the cell population of the bone-marrow is also of clinical interest. The author describes the relative vulnerabilities of the different cell-types and attempts to correlate these with the experimentally determined changes of population following radiation. His theoretical approach permits an intelligent discussion of the treatment of radiation damage to the marrow. In a similar way the author has reviewed the actions of tumour-chemotherapeutic agents, which to some extent resemble those of radiation, presumably by interfering with D.N.A. synthesis. One method of measuring cardiac output is by injecting intravenously a foreign indicator substance and measuring its concentration in blood drawn from another site. An analysis of the curve obtained by plotting concentration against time permits the necessary computation. Korner contributes an elaborate study in which the theoretical principles at the basis of this method are investigated, and its application to clinical conditions, where it is a useful diagnostic tool for detection of a variety of circulatory disorders, is described in detail.

The remaining articles are of more academic interest: neural organization from an engineer's point of view by Uttley; nucleic acid synthesis by Goutier; and the buoyancy of fish and cephalopods by Denton. This last contains a fascinating account of the various expedients employed by aquatic animals in preventing themselves from sinking to great depths. The swim-bladder is only one of them. Who would have thought that the cuttle-bone that one picks up casually on the beach is really a laminated structure with air-chambers that the cuttle-fish may fill with gas or empty at pleasure and so modify its specific gravity? The same is true of the blue sail of the Portuguese man-of-war, *Physalia,* which is a gas-filled chamber, and, strange to say, the gas is carbon monoxide. Finally, the high concentration of ammonium salts in the blood of the crunchid squid may be a means of lowering its specific gravity, since a solution of these is less dense than sea-water.

The editors are certainly to be congratulated on the catholicity of their choice of subjects; their editing, also, seems to have been efficient, but why permit the word "theoretize"? (p. 88).

HUGH DAVSON.

RADIOLOGY FOR SURGEONS

Radiology as a Diagnostic Aid in Clinical Surgery. By Howard Middlemiss, M.D., F.F.R., D.M.R.D. (Pp. 151 +viii; illustrated. 30s.) London: William Heinemann (Medical Books) Ltd. 1960.

There can be little doubt that in these days of specialization the clinician is often isolated from those who carry out the various investigations on his cases, and so there is a tendency for him to rely on the written report without himself having sufficient knowledge of the techniques involved or of the grade of accuracy, and the clinical deductions therefrom, which can be expected. This applies to a wide range of special investigations, but one with which the surgeon is especially concerned is radiological diagnosis. Of course no surgeon can be expected to be also a radiological expert, but he should have what may be called a working knowledge of the subject. This book sets out to provide it.

On the whole the attempt seems to be successful, for, though the experienced surgeon will probably be well acquainted with most of the matter which the book covers, the surgical student and the junior surgeon will find in it much of interest. To judge exactly how deeply the subject should be entered into must have been difficult for the author, but he appears to have made a wise choice. As he says in the preface, most books on radiology include a lot of diagnostic and technical minutiae which have little application to the work of the practising surgeon.