unity of outlook that makes the book eminently readable despite its length. Lest English readers may be deterred by the language barrier, let it be said that the characteristics of clarity and simplicity extend to the language side also. The general contents of the volumes are much what one would expect, though it should be noted that the stress throughout is on general questions rather than on applications. Thus, to give but one example, the structure of the Periodic Table is treated with unusual brevity and the structure of molecules is not discussed at all. On the other hand the appendixes include a full summary of mathematical group theory. Like most text-books the reader is taken right up to relativistic theory, with a chapter on the Dirac electron and a sketch of quantum electrodynamics. Such final chapters are of course only useful in providing the 'further outlook' that whets the reader's appetite. To treat them in detail in the author's individual style would surely have required two further volumes.

Thirring's "Principles of Quantum Electrodynamics" deals with precisely the last-mentioned questions. Superficially at least it is diametrically opposed to what one imagines a continuation of Messiah would be. This is a translation of a book that originally appeared in German and was at the time most favourably acclaimed by the experts. Though the English edition is an expanded version of the original, brevity is, even now, an outstanding characteristic of this author's style. Perhaps the most notable single aspect of this work is its combination of fully up-to-date mathematical treatment with a continual stress on the physical meaning of the formalism. However, for entirely different reasons, one can say of this work just as of Messiah's that, while it is probably not the best first introduction to this field, it is eminently recommendable to the reader who seeks to acquire depth of understanding—and not merely dexterity in manipulation—in a difficult subject.

N. Kemmer

WHAT IS AGRONOMY?

Advances in Agronomy

Vol. 10. Pp. xii+547. 12.50 dollars. Vol. 11. Pp. x+428. 12 dollars. Edited by A. G. Norman. (Prepared under the auspices of the American Society of Agronomy.) (New York: Academic Press, Inc.; London: Academic Press, Inc. (London), Ltd., 1958–59.)

WHAT *is* agronomy? Certainly, like 'billion' and 'suspender', it suffers a potentially embarrassing change of meaning in crossing the Atlantic. In England, little would be left for agronomy when the claims of chemistry, entomology, plant pathology and so on had been stated—perhaps the study of green manuring, seed-rates and sowing dates.

In the United States apparently the subject of agronomy comprises pretty well all agricultural science. Subjects covered by the present volumes range from liming to castor-beans and from wheat stem rust to water and its relation to soils and crops.

"Advances in Agronomy" is written mainly by Americans about conditions in the United States; out of 17 articles only 2 come from institutions in other countries. (References to recent British work are very rare.) Many articles (especially those on soil chemistry) deal with fundamental work and make little reference to field experiments or practice. Many are rather turgid summaries of their subjects, devoting only small space to recent advances.

Among articles which appealed to me are those on individual crops (safflower and castor-beans) and on stem rust of wheat; the last is an excellent account of the difficulties of plant breeders competing with an adaptable air-borne pathogen. The article on recent developments in agricultural machinery in the United States is excellent and is one of the few articles of direct interest to British farmers.

Two articles come from outside the United States. One is a full account of the classification of the soils of Australia with their pedological descriptions; the known incidence of mineral deficiencies is concisely set out on maps. The other deals with the soils of Holland, relating their origins to their present appearance and the farming systems which have been established on them.

The articles in these two volumes, with a few exceptions, read like a disjointed collection of condensed text-books, or chapters from text-books. The range of subjects covered is far too wide to justify the implied suggestion that they are all branches of one science. These volumes do not establish 'agronomy' as a science.

G. V. Dyke

FLUID DYNAMICS: A MIXED BAG

Fluid Dynamics

By Dr. D. E. Rutherford. (University Mathematical Texts.) Pp. ix+226. (Edinburgh and London: Oliver and Boyd, Ltd.; New York: Interscience Publishers, Inc., 1959.) 10*s*. 6*d*. net.

Introduction to the Theory of Compressible Flow

By Prof. Shih-I Pai. Pp. xiii+385. (New York: D. Van Nostrand Company, Inc.; London: D. Van Nostrand Company, Ltd., 1959.) 9.75 dollars; 73*s*.

Fluid Mechanics

By L. D. Landau and E. M. Lifshitz. Translated from the Russian by J. B. Sykes and W. H. Reid. (Course of Theoretical Physics, Vol. 6.) Pp. xii+536. (London and New York: Pergamon Press, 1959.) 105*s*. net.

AS an aftermath of the rapid development of fluid dynamics during and since the Second World War, books recording new results or re-interpreting old results are now appearing in large numbers. The variety of books on fluid dynamics is also increasing, and the above three volumes in particular are widely different in purpose, style and content.

Dr. Rutherford's addition to the valuable series of University Mathematical Texts is aimed at undergraduates taking an honours course in mathematics in Britain. This is a sensible aim, for there is a dearth of introductory texts on fluid mechanics that are up to date in spirit as well as in content. Most teachers of the subject are aware that the older books, which concentrated on 'perfect' fluids because greater analytical development was thereby made possible, are not very useful to-day and may even be educationally harmful. It is possible nowadays to teach aspects