

been, and performance-theory analysis is oversimplified; in particular, the omission of the non-dimensional approach to performance plotting is more than regrettable. So far as compressor design is concerned there are again important omissions, though the simplified aerodynamic treatment of the axial compressor will be found useful as an introduction to the subject. In dealing with turbine design, the author reverts to a treatment that has now been largely superseded, containing, as it does, the now out-moded distinction between impulse and reaction types. The chapter on rocket-power plants is both comprehensive and instructive, and the book concludes with a useful survey of the properties and constituents of alloys suitable for high-temperature service.

Summarizing, therefore, while the book may be said to provide a useful exposition of fundamental theory, it can scarcely be recommended as one giving an up-to-date treatment of the aerodynamics and thermodynamics of gas-turbine jet-engine design and performance. S. J. MOYES

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## NEW DEVELOPMENTS IN PHYSICS

### Reports on Progress in Physics

Vol. 11 (1946-47). Pp. ix + 462 + 11 plates. (London: Physical Society, 1948.) 42s. net; to Fellows, 25s. net.

WHEN introduced in 1934, "Reports on Progress in Physics" was intended to be a series of annual reports. In 1942, owing to the need for economy in time and material, a change in policy was made, for what was thought would be only for the duration of the War, by publishing one volume every second year. Unfortunately this temporary measure had to be continued after the cessation of hostilities; but it is now hoped that the volume under review will be the last of the two-year volumes. Indeed, the welcome news has recently been given that Volume 12 is already in active preparation and should be published later this year.

In earlier volumes the responsibility for production was taken by a general editor; first by Prof. Allan Ferguson, and then, more recently, by Dr. W. B. Mann. For Volume 11, a small editorial board, under the chairmanship of Dr. G. B. B. M. Sutherland, was set up.

Several branches of physics and technology are covered by the thirteen separate articles in Volume 11. Five articles are grouped together under the general heading of meteors, comets and meteoric ionization; four of them are based on the lectures delivered at the Physical Society Conference held at Manchester in March 1947 (an account of this Conference was given in *Nature*, 160, 76; 1947), and the fifth, by Dr. R. W. B. Pearse, dealing with spectroscopic observations on comets, meteors and meteorites, has been added for the sake of completeness. Both the astronomer and the physicist will find much of interest in this group of reports, for much new information on meteor activity has only recently been obtained by the use of refined radio techniques which were developed during the war period.

In the authoritative and masterly report contributed by Prof. E. C. Stoner on ferromagnetism, the background to the more recent developments in this subject, that is to say, the general ideas and prin-

ciples gained from investigations up to about 1934, together with the theoretical and experimental work done on intrinsic magnetization since 1934, are described. Although the published work on ferromagnetism is very extensive, and several reviews dealing with particular aspects have appeared within the past fifteen years, Prof. Stoner's article is the first dealing specifically with ferromagnetism to appear in the "Reports". It is to be followed in the next volume by a further report by Prof. Stoner on recent work on magnetization curves and associated phenomena.

Nuclear physics is represented by three articles. Recent experimental work on the recoil of nuclei in beta-disintegrations, with particular reference to the neutrino, is reviewed by B. Pontecorvo. The results which have been obtained, the limitations of the method, possible future developments and the most promising techniques are clearly stated. The more recently discovered cases of radioactive branching are admirably classified by Prof. N. Feather, and the phenomenon is discussed in general terms. The illustrated and informative account of electrostatic generators for the acceleration of charged particles, contributed by Prof. J. R. van der Graaff and co-workers, should prove most useful, for many laboratories are now actively engaged in constructing large electrostatic accelerators for use in nuclear research.

It is largely due to the work of Prof. D. R. Hartree that the extra-nuclear structure of many atoms has been calculated. The Hartree 'self-consistent field' method, and the Fock 'self-consistent field with exchange' method, together with various other modifications, as well as a table summarizing the results of the various calculations on the different atoms, are all carefully and concisely explained by Hartree himself in his article entitled "The Calculation of Atomic Structures".

Two other important recent developments in physics, the detection of infra-red radiation and the application of infra-red methods, and the radio-frequency spectroscopy of gases, are dealt with in articles by G. B. B. M. Sutherland and E. Lee, and B. Bleary, respectively. Ultrasonics research and the application of ultrasonic methods to the study of the gaseous, liquid and solid states of matter are the subject of a report by C. Kittel; and, in the technological field, articles by W. F. Eerg on the latent-image formation in photographic silver halide gelatine emulsions, by H. Friedenstein, S. L. Martin and G. L. Munday on the mechanism of the thermionic emission from oxide-coated cathodes, and by H. Moore on physics in glass technology, are of considerable interest. The study of natural evaporation is mainly part of meteorology, but it overlaps into many other scientific fields; and the survey of evaporation in *Nature* given by H. L. Penman should be of value not only to meteorologists, but also to those interested in the formation and distribution of soils and in the growth of crops.

All the reports are accompanied by extensive bibliographies, and the volume has an excellent author index. Volume 11 is well up to the high standard of its predecessors. The demand, it is understood, is already great, and doubtless it will soon, most regretfully, become, like most of the previous volumes, an 'out-of-print' edition, with a long waiting list of applicants for second-hand copies. The Physical Society is indeed to be congratulated on another excellent "Progress Reports". S. WEINTROUB