

account of the history of the acetylene industry. Thoughts of Edwardian times are brought to mind with reference to the use of acetylene for public lighting, while Sherlock Holmes studied new methods of safe breaking by burglars. The importance of acetylene in the German economy of both World Wars is most clearly brought out.

The physical properties of acetylene are next dealt with in detail: every parameter is exhaustively tabulated. The third chapter deals with calcium carbide and the hardware required for its production is fully described and illustrated. It is a pity that the photographs of carbide furnaces are not in colour; one has just to imagine the troglodytes stoking the smoking fires of Hell. The following chapter dealing with the production of acetylene from carbide is necessarily tamer, but well illustrates the ingenuity of man in devising reactors for dealing with a solid-liquid-gas reaction.

The production of acetylene from hydrocarbons represents the final attempt to give acetylene a modern look, and the various possibilities are well catalogued. Most important are the Wulff regenerative cracking processes, which are well described, and the BASF partial combustion process, which merits a fuller description.

A useful account of the decomposition and handling of acetylene is next given, including regulations at present in force in many major countries governing its use. The explosive properties of acetylene have resulted in very many restrictive regulations in Britain, set up by Acts of Parliament in the earliest days when the hazard was little understood. This effectively acted as a bar to progress in acetylene technology in Britain—unlike the United States and more particularly Germany.

The subject of acetylene flames and detonation is comprehensively dealt with, and the work ends with the fuel uses of acetylene, mainly welding and cutting.

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ELECTROMAGNETICS

Electromagnetics

By Robert M. Whitmer. Second edition. Pp. x + 357. (London: Prentice-Hall International, 1962.) 63s.

Classical Electrodynamics

By John D. Jackson. Pp. xvii + 641. (New York and London: John Wiley and Sons, Inc. 1962.) 85s.

Electromagnetic Theory for Engineering Applications

By Prof. W. L. Weeks. Pp. xix + 744. (New York and London: John Wiley and Sons, Inc., 1964.) 135s.

IT is a tribute to the genius of Maxwell that the laws of the electromagnetic field which he developed should have stimulated a vast and ever increasing volume of literature over a period of a century designed to expound these laws and to show their application to the solution of electrical problems.

In recent years many of these classical studies have come from the United States, and the three selected for this review have the high standard of scholarship expected in American scientific books.

The claim to originality of a new book on this subject will normally rest on the problems which are treated. The preliminary development of Maxwell's equations is sometimes entirely omitted, but if it is included, the approach is usually very similar to that adopted by Maxwell. The only originality to be expected in this part of the work would be in the symbolism adopted and in the numerical problems presented for the exercise of the reader.

Electromagnetics, by Dr. R. M. Whitmer, is the most modest in size, and is the second edition of a work first published in 1952. There has been a revision of notation, the most striking feature of the new notation being the use of the heavy type figure one throughout for the unit vector. The book has been expanded in size: new topics

discussed are plane and solid angles, fringing fields, wave propagation in an electron environment, radiation pressure, momentum density and standing waves. Dr. Whitmer is primarily concerned with the application of vector analysis to field theory and his book is intended for the advanced undergraduate. Postgraduates would, however, find much of value in the book. Basic field theory is covered up to and including waveguide transmission, and Dr. Whitmer has provided about 300 numerical problems for the reader. References are given at the end of each chapter, but these are all to earlier books. This book is first and last a textbook of quality concerned with established theory. It does not attempt to cover recent developments.

Classical Electrodynamics by Prof. Jackson, is addressed to a more advanced reader. He starts at the normal beginning of a work on electromagnetism with Coulomb's law of electrostatic force, but progresses rapidly to the treatment of the advanced problems of magnetohydrodynamics, plasma physics, relativity, radiation by particles and collisions between charged particles. His notation is clear and logical, although many of his equations would be expressed more simply if he made use of the unit vector. For example, he gives Coulomb's law as

$$\mathbf{F} = k q_1 q_2 \frac{\mathbf{x}_1 - \mathbf{x}_2}{|\mathbf{x}_1 - \mathbf{x}_2|^3}$$

thus masking the inverse square nature of the law.

The book is well provided with numerical problems for the reader and references to other books. There is also an occasional reference to a paper in a scientific journal, but the prime purpose of the book is to show the student how to apply classical electromagnetic theory to advanced problems in engineering and physics, rather than to consider the latest advances in the subject.

Prof. Weeks's *Electromagnetic Theory for Engineering Applications*, like Prof. Jackson's, is addressed to the post-graduate student, but his starting point is the application of Maxwell's laws to the transmission line. From there he proceeds to discuss methods of solution of the field equations in rectangular, cylindrical and spherical coordinates. The new method of approach is a refreshing change, but it is rather doubtful whether the treatment is simpler or easier to follow. The book contains both numerical problems for the reader and references to other books.

The absence of references to scientific papers in all three books seems to suggest that students in the United States are expected to obtain a thorough grounding in their subject before venturing to read about the latest scientific advances. Those who master the contents of these books should be well equipped with the techniques required for the solution of advanced problems, and should soon be able to make an original contribution in the subject of their choice.

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NEW KNOWLEDGE OF THE THYMUS

The Thymus in Immunobiology

Structure, Function, and Role in Disease. Edited by Dr. Robert A. Good and Ann E. Gabrielsen. Pp. xxii + 778. (New York and London: Hoeber Medical Division, Harper and Row, 1964.) 24.50 dollars; 184s.

THE *Thymus in Immunobiology* contains the collected papers presented at a symposium sponsored by the University of Minnesota. In contrast to most proceedings of conferences this book contains a remarkable number of reviews of the subject and of original papers, only a very few of the contributions being of the 'pot-boiling' type common to works of this kind. The contents cover all the most recent fields of investigation on the anatomy, physiology, pathology, and clinical disorders of the thymus; the volume and range of the contents illustrating the astonishing growth of knowledge in a subject which scarcely existed five years ago.