C) around a point source (14 Mev) which was pulsed (6 sec). The Swedish work demonstrated the feasibility of measuring the prompt kinetics of a subcritical reactor system.

Electromagnetic Waves. By G. Toraldo di Francia. (Translated by author, 1956.) 320 pp. Interscience Publishers, Inc., New York, 1953. $6.00. *Reviewed by Victor Twersky, Sylvania Electronic Defense Laboratory.*

This text (translated from the Italian "Onde Elettromagnetiche" by the author) is based on a series of lectures in the Physics Department of the University of Florence. It begins with a mathematical introduction dealing with vectors, tensors, Fourier series, and the method of stationary phase; it ends with a general treatment of resonant cavities. In between are chapters on units, potentials, fields in moving systems, circuits and transmission lines, propagation in homogeneous media, geometrical optics, diffraction, and wave guides. It includes a list of ten supplementary texts and historical sections on units, the electromagnetic field, special relativity, and wave theory.

The author's aim is "to give a clear and readily understandable introduction to those students who will later engage in theoretical research and also to those who will be concerned with the more and more brilliant applications of electromagnetic waves". However, although simply written and broad in scope, the treatment is often too casual. It has good general introductions to a large variety of topics, but contains practically no applications to specific problems. It includes no lists of problems, no references, and gives little indication of the present vitality of the subject.

For example, the sections on diffraction and geometrical optics are given a fairly firm basis for analytical work, but little is done with it. No mention is made of the rigorous work in diffraction theory initiated by Rayleigh's solution of the cylinder problem and Sommerfeld's solution of the half-plane, or of the new geometrical optics which arose from Luneberg's asymptotic representations of solutions of Maxwell's equations. The author's contention that particular problems are excluded because they "would in most cases amount to mere exercises on special functions" has, of course, some validity; however, it is the pedagogue's special function to choose illustrations that indicate the essentials and fruits of the methods rather than the tedium of their detailed application. Much better for the author to include "the customary little treatise on Bessel functions" in his mathematical introduction (not that such functions are necessary for many adequate illustrations) than leave the student with the impression that little has been accomplished since the time of Kirchhoff. (After all, an author that encourages his students to use tensors cannot keep them for long from other grim realities; better tell them about such things while their heads are still soft. Better still, make an ele-

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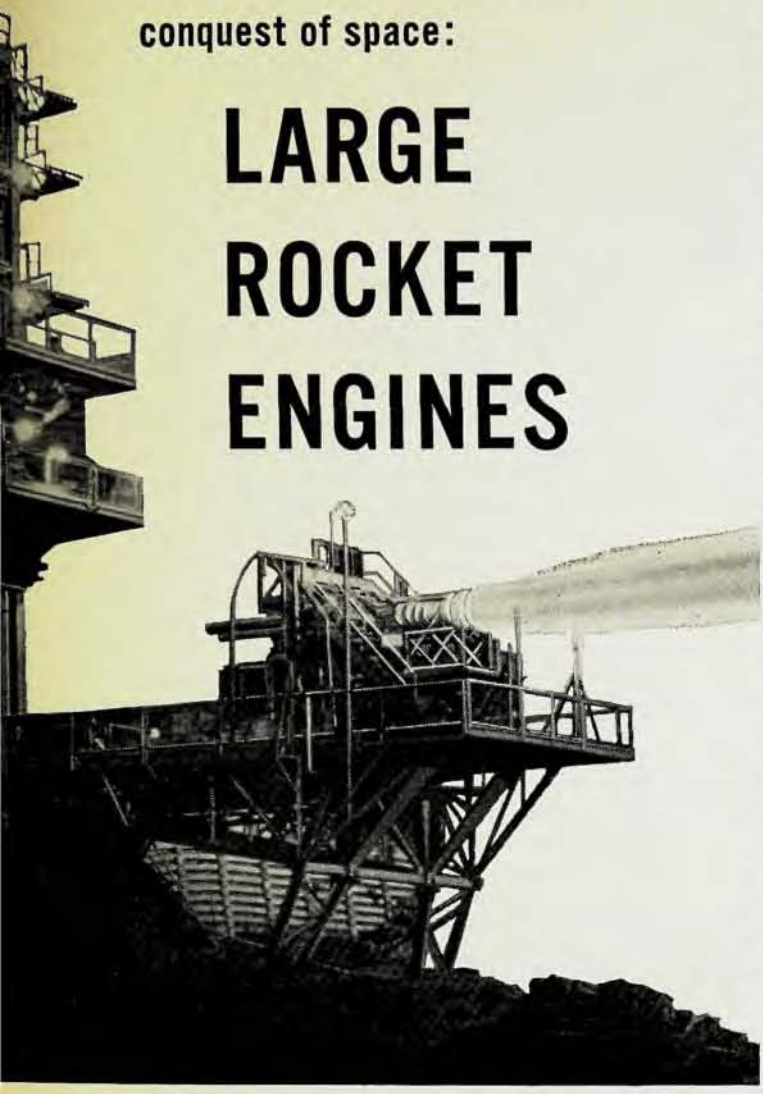

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WILLIAM J. CECKA, JR., 35, aeronautical engineer, (Univ. of Minn. '43), was called from North American by the Air Force for experimental rocket work in 1944. On his return, he progressed rapidly: 1948, supervisory test job; 1950, group engineer, operations; 1953 engineering group leader; 1955, section chief of engineering test. Using our refund plan, he has his M.Sc. in sight.

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mentary course in analysis a prerequisite, and dispense with the mathematical introduction entirely.)

The shortcomings of the work are thus essentially of omission. Although it contains the basic material for a first year graduate course, and presents this quite readably for most physics and engineering students, it needs applications, problem lists, references, and an account of the more recent work to make it a complete text on electromagnetic waves.

Une Tentative d'Interprétation Causale et non Linéaire de la Mécanique Ondulatoire. By Louis de Broglie. 297 pp. Gauthier-Villars, Paris, France, 1956. Paperbound 3.500 fr. *Reviewed by L. Marton, National Bureau of Standards.*

When I received de Broglie's book in the mail, my first reaction was that I made a mistake in accepting this book from *Physics Today* for review. Nevertheless, a sense of duty prevailed and I opened it before making my decision to send it back to the editor for reassignment to another reviewer. After opening it, I read part of a page and my curiosity was aroused. Immediately, I took my pocketknife and started cutting some of the pages (you know, practically all French books come paper-bound with uncut pages). That was my undoing—as I went along, I became more and more fascinated by the book until I could hardly put it down. Now, after having gone through it I can't claim I know all about the book, but I can assure you that it is something very worthwhile looking into.

The main idea of the book is very clearly described in de Broglie's own foreword. His original conception of wave mechanics was that of a pilot wave where the wave accompanied the particle and guided it along its path. Very early in the days of wave mechanics, that view was, however, supplanted by the more statistical interpretation of wave mechanics as advocated by the great school of theoretical physicists—Bohr, Born, Heisenberg, Pauli, and many others. In recent years, a new interpretation is growing up, and it was more or less started by Bohm; or it happens that de Broglie, himself, has been considering for almost thirty years a different interpretation of wave mechanics which he now calls the theory of the double solution. This theory has lain dormant for a number of years, and apparently it was only in the last few years that he saw a revival of his earlier thoughts in this direction. In this theory, there are two coupled solutions of the wave equation—one is the ψ-wave which because of the continuous character of its amplitude has only a statistical and subjective significance. The other solution is the u-wave which has the same phase as the ψ-wave, but with very wide variations of the amplitude, particularly in a region in space corresponding to the singularity called the corpuscle. This dual solution of the equation satisfies, therefore, almost all descriptions of the physical reality in the sense that the u-wave in the region of singularity describes the particle, whereas outside of that region both waves describe the wavelike behavior