There is no discussion of the fields associated with the Crab nebula and with the structure of the galaxy. An unfortunate error carried over from an earlier publication of the author is the value of 20 km/sec quoted for the orbital velocity of the earth.

Colloque national de Magnetisme: commemoratif de l'oeuvre de Pierre Weiss (Strasbourg, July 1957). 338 pp. Centre National de la Recherche Scientifique, Paris, France, 1958. 4000 fr. *Reviewed by C. Kittel, University of California at Berkeley.*

THIS volume contains the proceedings of a conference held at Strasbourg in July 1957 in commemoration of the work of Pierre Weiss, fifty years after the publication of his fundamental paper on the molecular field. The outstanding workers in ferromagnetism in France today have contributed to the volume. The result is a collection of quite important papers covering the most active areas in ferromagnetism. The more extensive papers are those by Néel on the molecular field, Guillaud and Vautier on domain structures (with beautiful photographs), Trombe and la Blanchetais on the rare earths, Pauthenet on the rare earth garnets, and Paulevé and Marchand on resonance in LiCr ferrites.

The Pulse of Radar: The Autobiography of Sir Robert Watson-Watt. 438 pp. The Dial Press, New York, 1959. $6.00. *Reviewed by W. T. Wintringham, Bell Telephone Laboratories.*

NOT "Too little and too late", but exactly enough at the right time is the story that Sir Robert Watson-Watt tells in his autobiography *The Pulse of Radar.* England was fortunate indeed that Sir Robert's response to an inquiry from the Air Ministry about "Death Rays" took the form of the Memorandum of February 12, 1935, entitled "Detection and Location of Aircraft by Radio Methods". For it was his confidence expressed there that led to the development of radar which so definitely affected the course of World War II.

England was doubly fortunate in that she entrusted the development of the ideas expressed in the Memorandum to the man who describes himself as:

"A sixth-rate mathematician, a second-rate physicist, a second-rate engineer, a bit of a meteorologist, something of a journalist, liking to believe there is some poetry in my physics, some physics in my politics."

But more important than this, Sir Robert is the man whose work was guided by the "Cult of the Imperfect", which he describes in these words:

"Give them the third best to go on with; the second best comes too late, the best never comes."

One shudders to imagine what might have happened if England had not been equipped with Sir Robert's "Third Best" at the critical time.

The details are all there—radio meteorology, early warning radar, antisurface-vessel and antisubmarine

radars, tracking for gunfire, bombing-through-overcast, IFF, GEE, Rebecca, and many more. But one's interest is held, not by the detail, but by the whole picture of devices and techniques pushed to if not beyond their reasonable limits. Skepticism, failures, and successes are all put down in words.

As an example of English literature, this is a very bad book. As a story, disjointed at times, of one man's contribution to modern warfare, it makes fascinating reading.

Letter from an Author

Sir:

I would like to answer some of the points raised in the review of my book *Principles and Applications of Random Noise Theory*, John Wiley, New York, 1958 (*Physics Today*, April 1959).

First of all, there is the question of how one should introduce certain fundamental ideas of random processes. The usual procedure is to compel the student to first learn many abstract ideas about probability theory. This book deviates from that approach so as to interest a wider audience in the subject matter, and gradually motivate a study of more difficult concepts. The desired goal requires more physical explanation than is customary and a greater appeal to heuristic arguments. It is believed, however, that this arrangement has considerable merit for the intended audience, even though, at an earlier stage, it may bring in a few concepts intuitively rather than rigorously.

Secondly, the review picks out a few minor errors which are partly differences in attitude, but fails to give proper mention to many worthwhile topics discussed in the book which are not available elsewhere. Fortunately, these matters have been commented upon by other reviewers, cf., *Proceedings of the IRE* (March 1959), *American Scientist* (March 1959), *Electronic Engineering*, Great Britain (February 1959), *Consulting Engineer* (January 1959).

In particular, this book contains: (1) A full treatment of Rice's representation of random noise and its application to various problems. (2) Demonstration of the widespread importance of exponential-cosine autocorrelation functions by analyzing many different possible sources (a matter which deserves greater study and appreciation). (3) Many practical engineering and mathematical details on statistical errors in measuring autocorrelation functions of exponential-cosine form. (4) Useful advanced material on a general class of optimum time-variable filters. (5) Discussion of measurement errors in nonlinear envelope detection and correlation of random noise. (6) An analysis of the important zero-crossing problem, including derivation of some of Rice's significant work (which part was submitted to Rice for examination and check prior to publication). (7) Development of some analog computer techniques for evaluating system response to noise inputs.

The reason that *a mean square error criterion for Gaussian distributions picks out the mean value for special emphasis* is twofold: (1) the mean square error is a minimum at the mean value point independent of the underlying distribution, (2) for a Gaussian distribution, the mean value is also the point which corresponds to the most probable event (i.e., has maximum probability density). This latter feature is not true for arbitrary distributions, but is shared only with a restricted class whose most important member is the Gaussian distribution.

The dual input problem considered in Chapter 4 is of the "distortionless" type in which the choice is deliberately restricted to linear devices which eliminate the distortion term due to the signal components. The resulting optimum system is no longer dependent upon the signal statistics in any way. This procedure is recommended from a practical point of view in many physical situations [see Stewart, R. M. and R. J. Parks, "Degenerate Solutions and an Algebraic Approach to the Multiple-Input Linear Filter Design Problem", *Trans*. IRE, *Circuit Theory*, Vol. CT-4, pp. 10–14 (March 1957)]. The discussion is, of course, applicable only to these important cases.

To conclude, no book can hope to satisfy every possible audience or to cover every aspect of an expanding subject matter. Those who desire great rigor of presentation or highly abstract analysis will prefer other references listed in the Bibliography which are intended for that purpose. This book is written in a form to be understandable by students and practicing engineers having many different backgrounds. The needs of such readers are kept constantly in mind by the author.

Julius S. Bendat

Books Received

THE DESIGN OF PHYSICS RESEARCH LABORATORIES: British Inst. of Physics Symp. (Royal Inst., London, Nov. 1957). 108 pp. (Chapman & Hall) Reinhold Publishing Corp., New York, 1959. $4.50.

LAW AND ADMINISTRATION. Series X, Vols. 1 & 2 of Progress in Nuclear Energy. Edited by Herbert S. Marks. 994 pp. Pergamon Press, London & New York, 1959. $26.50.

THE LOGIC OF SCIENTIFIC DISCOVERY. By Karl R. Popper. Translated by author from 1934 German ed. 480 pp. Basic Books, Inc., New York, 1959. $7.50.

A DICTIONARY OF NAMED EFFECTS AND LAWS IN CHEMISTRY, PHYSICS AND MATHEMATICS. By D. W. G. Ballentyne and L. E. Q. Walker. 205 pp. The Macmillan Co., New York, 1959. $6.00.

SOVIET SPACE SCIENCE (2nd Revised Ed.). By Ari Shternfeld. Translated from Russian by Technical Documents Liaison Office, Wright Patterson AFB. 361 pp. Basic Books, Inc., New York, 1959. $6.00.

THE CHEMISTRY AND PHYSICS OF CLAYS AND OTHER CERAMIC MATERIALS (3rd Revised Ed.). By Alfred B. Searle and Rex W. Grimshaw. 942 pp. Interscience Publishers, Inc., New York, 1959. $16.25.

MATHEMATICS DICTIONARY (2nd Revised Ed.). Edited by Glenn James and Robert C. James. 546 pp. D. Van Nostrand Co., Inc., Princeton, N. J., 1959. $15.00.