

data and the attempts to fit these in terms of a static, nonrelativistic potential.

(2) *The Three-Body Problem in Nuclear Physics*, by M. Verde, a summary of methods and progress in the simplest nuclear many-body problem; the difficulties in making the step from two to three bodies illustrate the essential hopelessness of attempting to solve the problems of nuclear structure by a direct solution of the many-body problem in terms of two-body forces (assuming they were known).

(3) *Matter and Charge Distribution within Atomic Nuclei*, by D. L. Hill. Mainly a critical survey of the information on nuclear size and shape as deduced from observations on electromagnetic and nuclear interactions.

(4) *The Nuclear Shell Model*, by J. P. Elliott and A. M. Lane. A summary of methods and results in applying the independent particle model to the study of nuclear structure, starting from the simplest shell models and increasing in complexity by the successive introduction of interactions between individual nucleons and with the collective motions of the "core".

(5) *Models of Nuclear Structure*, by S. A. Moszkowski. A comparison of models starting from the two extremes of independent particle motions and strongly coupled motions, with a lengthy summary of some recent promising attempts at a unification of the two points of view.

The authors are all authorities in their fields and these articles, with respect both to content and clarity, reflect the depth of their understanding of their respective subjects.

Chemisorption: Proceedings of Symp. (U. College of N. Staffordshire, Keele, Staffordshire, England, July 1956). Edited by W. E. Garner. 277 pp. (Butterworths, England) Academic Press Inc., New York, 1957. \$9.00. *Reviewed by Henry Wise, Stanford Research Institute.*

The proceedings of the symposium on "Chemisorption" held at the University College of North Staffordshire in 1956 are a continuation of those on "The Adsorption of Gases" at Oxford in 1932 and on "Heterogeneous Catalysis" at Liverpool in 1950. The twenty-three papers presented at this meeting are divided among five main topics: (1) Theory of Chemisorption; (2) Chemisorption on Insulators; (3) Chemisorption on Metals; (4) Chemisorption on Semiconductors; and (5) Chemisorption on Carbon. Primarily the articles are concerned with the more fundamental aspects of catalysis, both theoretical and experimental, as viewed by some of the leading European workers in this field. It is rather noteworthy that in this volume one does not find a single contribution from the USA.

Some of the formal presentations give up-to-date reviews of certain aspects of heterogeneous catalysis such as the fine paper by Dowden on chemisorption and valency, that by Trapnell on mechanisms of chemisorption, and that by Stone on chemisorption on semicon-

ductors. Of special interest is the growing evidence for the presence of states of chemisorption intermediate between physical adsorption and strong chemisorption as further brought out in the discussions following the theoretical section on chemisorption. Also, the increasing importance of electronic factors in heterogeneous catalysis becomes particularly evident in the sections dealing with chemisorption on metals and semiconductors. Application of the electron resonance technique to studies on the interaction of various adsorbents with the unpaired electrons present in the carbon surface is described in an interesting paper by Ingram.

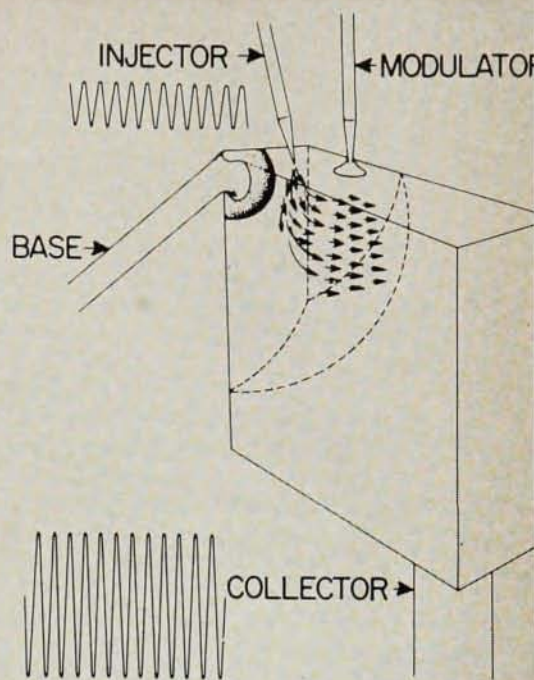
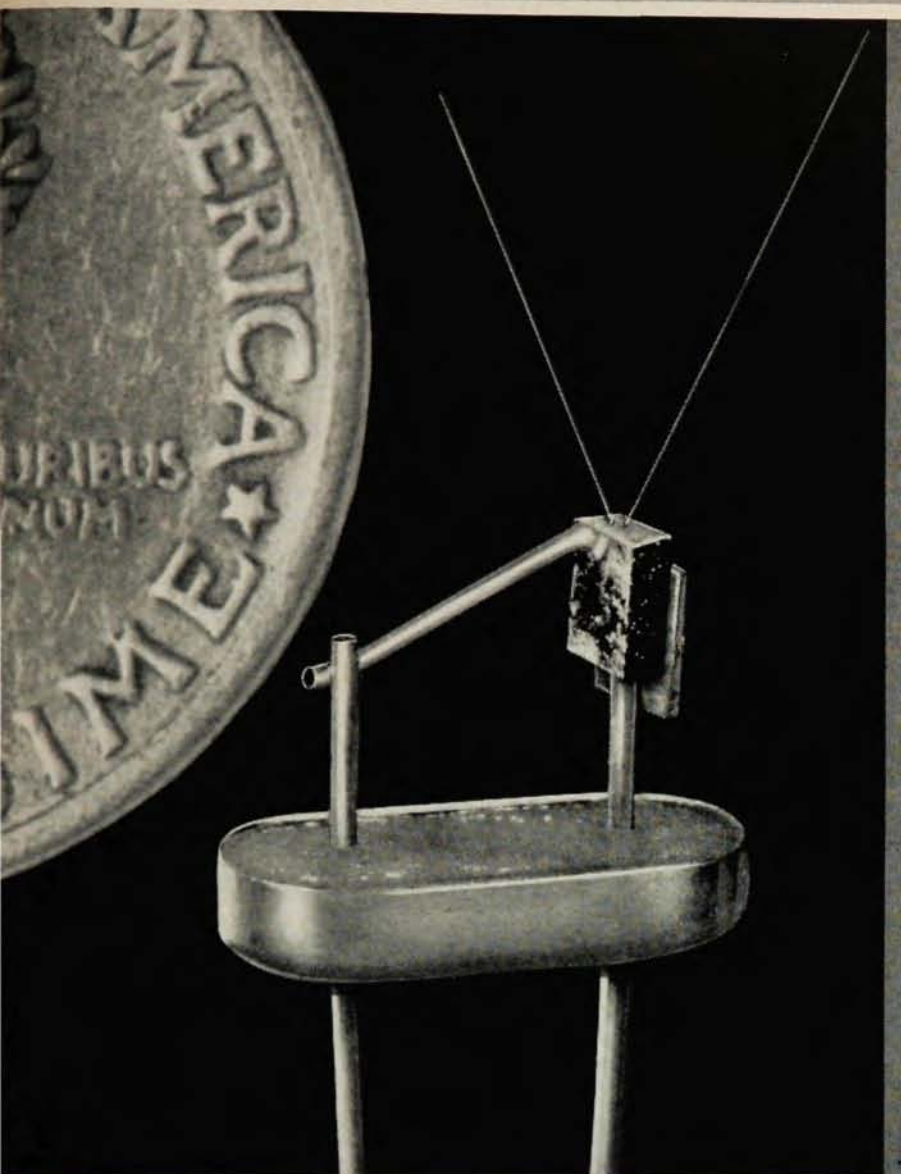
In conclusion, the proceedings of this symposium are of particular significance to the specialist engaged in research on catalysis. This rapidly advancing field is well served by discussions of the type held at Staffordshire.

Fads and Fallacies in the Name of Science (2nd Revised Edition). By Martin Gardner. 363 pp. Dover Publications, Inc., New York, 1957. Paperbound \$1.50. *Reviewed by L. Marton, National Bureau of Standards.*

In a time when the popular mind is reawakening to the importance of science, it is useful to have books on hand which help distinguish between "good science" and "bad science". Many may ask, "What is good science and what is bad science?" Not all good scientists make good science, so you can't define good science on the basis of its perpetrator alone. Generally a good scientist knows what constitutes good science and just by instinctive feeling he can pursue a line of thought which will lead to new and important results. It is much harder, however, to make the general public understand what constitutes good science. Many sins are committed in the name of science, and the general public which is unable to distinguish between the two types of sciences will, generally, follow more "bad sciences" because its practitioners are better salesmen than those of "good science".

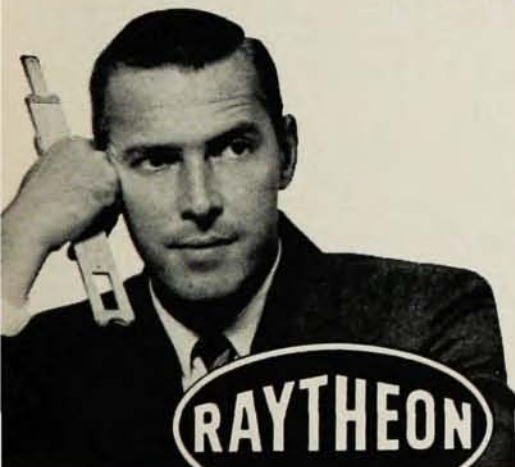
The book of Mr. Gardner under its revised title (the first edition titled: *In the Name of Science*) attempts to do precisely this educational task for the general public. This is a very difficult task and there is no simple answer to the question whether Mr. Gardner succeeded in doing it or not.

Fads and Fallacies covers an enormous amount of ground. Its 26 chapters range from Physics to Flying Saucers, from Dowsing Rods to Lysenkoism, across all kinds of Medical Cults including Dianetics, Parapsychology, and Extrasensory Perception. It is a book written by a man devoted to his task who has accumulated a tremendous amount of material and presents it very clearly and convincingly. It is very well documented and I have nothing but praise for the way its subject matter is presented. Nonetheless I do have reservations about its usefulness. The reason is stated in my beginning sentence. (At present we need good material to combat anti-intellectualism of the lay pub-



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lic and make them understand what is "good and bad science".) If I were to recommend a book to a lay reader on the subject of "good and bad science", I doubt if I would recommend Martin Gardner's book. There is too much in it. The average lay reader would have a hard time reading through it.

It is, however, an excellent book in the hands of a prepared reader, somebody who has already sufficient basic training to bring an understanding mind to its contents. I think its greatest value would be in the hands of the devoted people who are willing to go out and preach to the lay public. I would recommend it highly to science teachers in high schools and to college instructors who are faced with the task of going out and talking to people and trying to make them understand "what is good science and what is bad science". In the hands of such devoted people, this book can be of enormous value as a source book.

The review copy came accompanied by a circular written by the president of Dover Publications. He states, "the book was first published in 1952 and of the original 3000 copy press run about a 1000 were remaindered. During the same period of time it is estimated that the aggregate sale of pseudo-scientific books on flying saucers, reincarnation, health fads, eccentric theories, etc. is over two million." I am afraid that it is the nature of things that a book of this type does not sell too well. I would not expect that the present edition in spite of its excellent presentation and its low price, being a paperback, will have the same sales as the corresponding book on flying saucers. Nevertheless, the publishing house has made a very valorous effort and has to be complimented on its presentation of this book.

An Introduction to Reactor Physics (2nd Revised Edition). By D. J. Littler and J. F. Raffle. 208 pp. Pergamon Press, London & New York, 1957. \$5.50. *Reviewed by E. R. Rae, Columbia University (on leave from Atomic Energy Research Establishment, Harwell, England).*

This little book is a revised edition of a text which appeared in 1955 and was reviewed in these pages in July, 1956. It is based on a set of lectures given by the authors to the students attending the Reactor School of the United Kingdom Atomic Energy Authority. It is intended as a text for the graduate engineer or physicist who wishes to understand the basic principles of reactor design. The style is simple and direct; only present-day ideas are discussed and no attempt is made to describe the historical development of the subject. Since the book is aimed at the relatively unsophisticated reader, the style is probably very suitable. General references and suggestions for further study are given at the end of each chapter.

The second edition is 12 pages longer than the first, but has one less chapter, the material formerly presented in the final chapter on "Diffusion Length Measurements and Exponential Experiments" being now in-

corporated in earlier sections of the book. Several other chapters have been modified, enlarged slightly, and brought more nearly up-to-date by the inclusion of data released at the Geneva Conference of 1955. The general layout, however, has been preserved and the first six chapters lead the student, through a discussion of atomic and nuclear physics, to the subject of the chain reaction. The next six chapters deal with the problems of calculating the behavior of a reactor, the discussion being concerned mainly with thermal reactors, while the last three chapters deal with the allied subjects of shielding, radiation detectors, and irradiation damage in bulk matter.

There can be little doubt that this book is useful to the student who is making his first acquaintance with reactor physics.

On Nuclear Energy: Its Potential for Peacetime Uses. By Donald J. Hughes. 263 pp. Harvard U. Press, Cambridge, Mass., 1957. \$4.75. *Reviewed by H. Mendlowitz, National Bureau of Standards.*

It is usually difficult to express the knowledge acquired in a technical field in terms that would make it intelligible to the layman. D. J. Hughes in his book *On Nuclear Energy* has done just this. In giving us a clear treatment of a highly specialized field, he has made intelligible to the layman important aspects of our present-day technology. There are very few instances when the author lapses into a style of writing suitable only for a technical journal. This book is valuable also to those whose background in nuclear physics or nuclear engineering is very meager. He ably recreates great moments in the history of the subject so that the reader finds himself living through the disappointments and triumphs of the scientists and engineers.

The author first introduces the reader to the fundamentals of atomic and nuclear physics and then leads the reader through a series of steps to reactor physics and engineering. He also treats some of the problems involved in the nonmilitary applications of fusion. There is also a discussion of the economic and political aspects involved in the peacetime applications of nuclear physics.

This then is a book that will be useful not only to the scientist and engineer because of its treatment of the political and economic aspects of nuclear physics but especially important to those whose interest lies in the nonscientific fields, thanks to the author's able and thorough handling of this important subject.

Solid State Physics: Advances in Research and Applications. Vol. 4. Edited by Frederick Seitz and David Turnbull. 540 pp. Academic Press Inc., New York, 1957. \$12.00. *Reviewed by Robert T. Beyer, Brown University.*

The amazing mushrooming of that growth known as solid-state physics requires the annual publication of more than a single review volume. As a result, the edi-