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N 600
RATEMETER

N 676
GAMMA DETECTOR

The EKCO N600 Ratemeter provides continuously variable control and meter monitoring of either threshold or gate voltages with automatic or manual scan at the flip of a switch. This makes full use of the high efficiency of a scintillation counter, especially in the improvement of resolution of low-activity mixed samples. Also by selecting suitable settings of discriminator bias level and H.V. supply to the scintillation counter the relation between sample count rate and background count rate is given a maximum value, permitting, for a given accuracy, much shorter times per count. The EKCO N600 is not only a precision ratemeter but also a combined linear amplifier and ultra stable power unit for use with most high quality detectors, especially the EKCO N676 High Resolution Scintillation Counter. The integral precisely matched optical and mechanical assembly of the N.676 assures resolutions well surpassing older concepts. With the EKCO N600 Ratemeter it provides a system which meets today's needs for quality performance at surprisingly low cost. They are fully described in a brochure immediately available on request.



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heat of an Einstein solid, the vibrational specific heat of a gas, and the zero-point energy. Chapter 3 has many excellent applications such as in chemical equilibria, paramagnetism at low temperatures, body-centered cubic metals, substitutional alloys, ferromagnetism, radiation, and fuel cells. The student will find the numerous applications useful because they are developed systematically. There is achieved a fine pedagogic success in Chapter 3 which carries over into the remaining three chapters.

Statistical mechanics is introduced in Chapter 4 in a most readable manner, with a minimum of mathematical machinery; there are only subscripts, no superscripts or primes, etc. Bose-Einstein, Fermi-Dirac, and Maxwell-Boltzmann statistics are reviewed and a comparison made of the three. There then follows a description of electrons in solids. The last two chapters introduce concepts and methods of calculations of entropy of monatomic and of diatomic gases. These chapters are superb teaching materials. For example, in discussing diatomic gases the author has sections on the electronic entropy, the spectroscopic entropy of HCl 35, the comparison of statistical and calorimetric entropy, among many others.

The author succeeds in setting forth the concept of entropy in theory as well as by means of numerous applications in technology. The format is excellent. There is a table of contents and a subject index. This is a highly commendable introductory treatise on special aspects of entropy.

The Nature of Scientific Thought. By Marshall Walker. 184 pp. Prentice-Hall, Inc., Englewood Cliffs, N. J., 1933. Paperbound \$2.25.

Reviewed by **H. H. Bolotin**, Physics Department, Argonne National Laboratory, Argonne, Illinois.

In the last decade or so, titles similar to that of this volume, have led to various treatments which, for the most part, are largely vacuous and fall short of their mark. Marshall Walker has produced a book which is a welcome departure. This book introduces modern concepts and principles which underlie and govern scientific thought and methods. The definition, concept, and use of *models*, the *hypothetico-deductive* process, *potentials*, *quanta*,

and many other past and contemporary scientific concepts are presented in a way that is designed to lead the layman reader to a basic understanding of the foundations upon which scientific thought and the scientific process are built. This is accomplished in an extremely lucid manner which is by no means trivial, dull, dry, or humorless. The treatise is flooded with illuminating examples. However, the arguments, definitions, and expositions are not designed merely to obtain an assenting nod from the reader. The author presents a definite point of view which, at times, may clash with one's own; but it is extremely difficult to find a quick and ready counter-argument that justifies dismissal of his thesis or treatment. The book is highly informative, stimulating, and challenging.

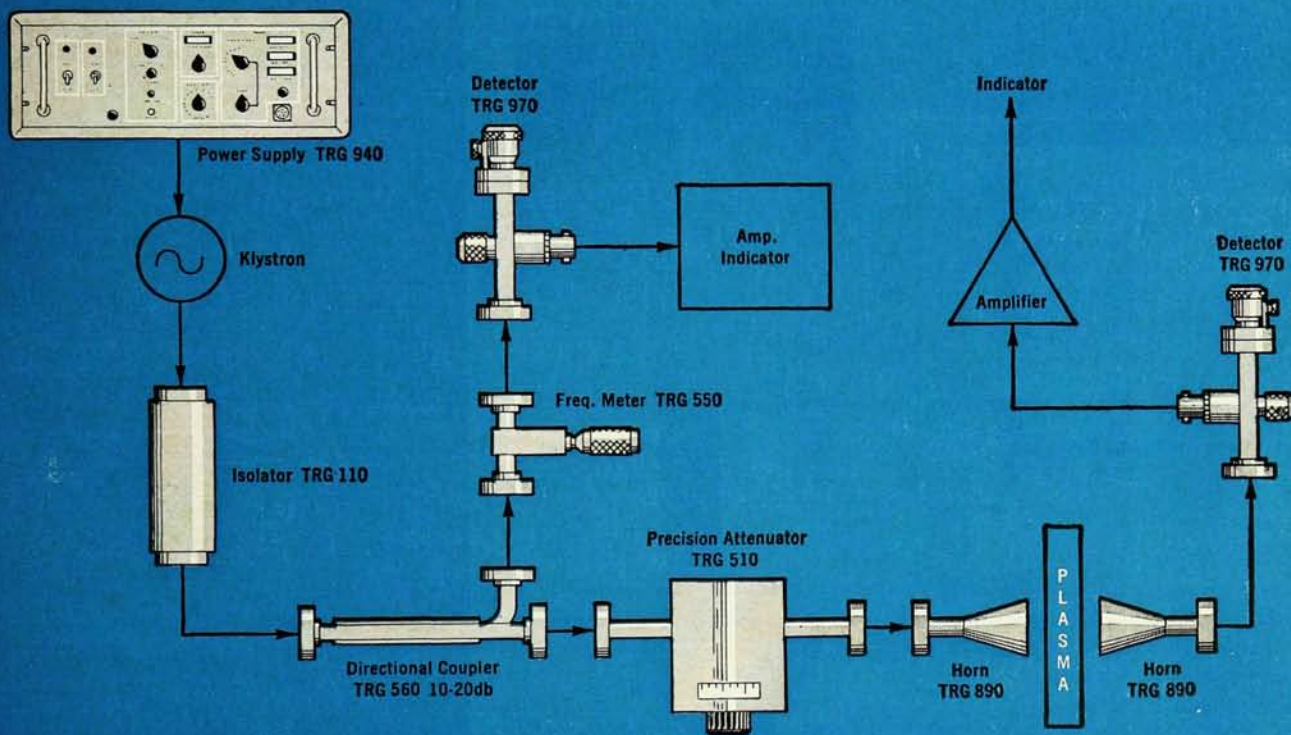
To the layman, it is a challenge to expend the effort and thought that few books with similar titles demand. The effort necessary is not mere perseverance; rather it is associated with the exploration of unfamiliar concepts and arguments. In fact, it would take a serious and dedicated layman to feed upon and digest the concepts and contents, although there is nothing presented which is ostensibly beyond his ken. To the scientist, it may be a challenge to his own point of view, and to his personal conception of the interpretations of the subject matter. The author's treatise is more than ample in scope and content to provide a rewarding experience to both the layman and to the professional practitioner of any of the scientific disciplines. This is *not* a book on the history of science. It is a lucid and meaningful exposition of scientific thought and processes as they exist.

The preface to this volume describes the attempt of the author to bridge the "gap" between the scientific and literary communities by presenting an explanation of science to the "general, educated reader" with "no previous knowledge of science or mathematics". In this he succeeds admirably. In addition, he does not fall into the trap of assuming that this is accomplished by directing his book to the casual reader whose primary interest is effortless or entertaining reading. Again, quoting from the volume's preface,

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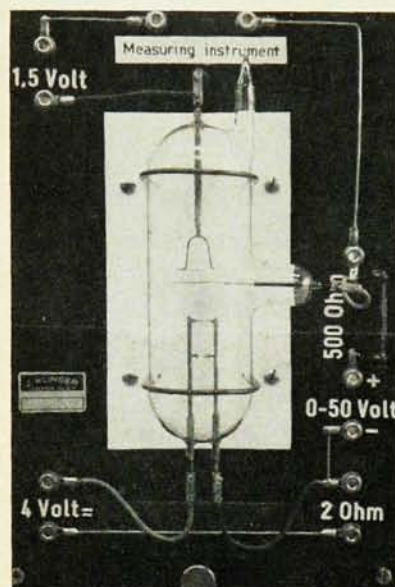
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ace, "The reader of literary works does not expect his reading to be effortless; he expects to exert himself to understand what the author is saying. Those reading about science must make a similar effort."

In the opinion of this reviewer, those who are prepared to expend such effort will find uncommonly rich rewards in this short volume.

Interplanetary Dynamical Processes. By E. N. Parker. Vol. 8 of Monographs & Texts in Physics & Astronomy, edited by R. E. Marshak. 272 pp. Interscience, New York, 1963. \$12.50.

Reviewed by **Gerald Johnson Jr.**, *Space Science Laboratory, Pennsylvania State University.*

In contrast to a text on planetary motion, which is usually thought of as the subject for planetary dynamics, this comprehensive work is concerned with solar, magnetic, and particle effects.

Indicating tabular data from the extensive observations that have been made since the advent of space probes is easy, as technical reports indicate, but much more difficult is the ability to transcribe these results into a readable logical form. The transition from topic to topic has been done very capably by the author.

The actual balance of information between the experimental and theoretical aspects is one that each reader will have to decide, however the theoretical outlook requires a deep understanding of the concepts of astrophysics.

With the selection of a dynamic rather than a static solar atmosphere as the basis of all activity, the author obtains Bernoulli's equation by integrating the expansion of the dynamic corona along streamlines. These hydrodynamic equations are then used as a basis to explain the existing data by means of a certain model. Although the model for such equations is incomplete, the results when applied to the solar wind prove of excellent value. By the application of hydro-magnetic equations, the approach to the explanation of the solar wind is carried out in excellent detail.

The mathematics involved in these solutions is not worked out step by step, but is given in sufficient detail such that the equations can be fol-

lowed in form. The handling of both relativistic and nonrelativistic cases, as well as irregular solutions to equations, certainly is a pleasure to find.

Extensive calculations are made on cosmic-ray effects and energetic solar particles. These both give the most important means of measuring the magnetic conditions of interplanetary space. The relation of measured results and the solar flares which cause the perturbation of the interplanetary magnetic field is worked out for various models. The general results of these perturbations over and above the eleven-year variation could be used as a general guide by one concerned with solar fluxes in the coming year—The International Year of the Quiet Sun 1964-65.

Such a timely work could well find its way into the personal libraries of those who are interested in a wide view of astrophysical phenomena through the magnetic effects in the universe.

Der Transistor. Physikalische und technische Grundlagen. By H. Salow, H. Beneking, H. Krömer, W. von Münch. Vol. 15, Technische Physik in Einzeldarstellungen, edited by W. Meissner and M. Nöbauer. 426 pp. Springer-Verlag, Berlin, 1963. DM 82.

Reviewed by **Hans J. Hagger**, *Albiswerk Zürich, Switzerland.*

It is difficult for an editor to give a homogeneous character to a monograph written by several authors, particularly when the subject concerns a circuit element which has not yet attained such a classical standard of interpretation as the electron tube has at present. The title of this monograph does not exactly represent its content. One expects under the title *The Transistor*, with the subtitle *Physical and Technical Principles*, a book exclusively on the physics and techniques of such an element, but in this case about half of the content deals with the application of transistors. In the first part, Dr. Krömer explains the physical principles, i.e., the energy band model, *p-n* junctions, the physical meaning of the elements in the equivalent circuit, etc. Then Dr. Salow gives the reader a very good picture of technological processes in transistor manufacture, the technology of semiconductor materials, the testing of