

- INVESTIGATION OF PHYSICAL PHENOMENA
- BASIC SENSORS
- APPLICATIONS OF NEW MATERIALS & TECHNIQUES
- INSTRUMENTATION SYSTEMS

EXPERIMENTAL PHYSICISTS AND PHYSICAL CHEMISTS

for expansion of a group concerned with the development of basically new techniques and with the solution of advanced instrumentation and measurement problems.

The nature of the problems solved by this group varies widely, so that the principal qualifications required are an inquiring intelligence and a sound background in physics, physical chemistry, and mathematics. Positions are available for both recent graduates and experienced people capable of accepting primary responsibility for specific programs. Present programs include work in the following areas:

- SPACE PHYSICS
- MEASUREMENT OF GEOPHYSICAL AND METEOROLOGICAL PARAMETERS IN AND ABOVE THE ATMOSPHERE
- VISIBLE AND ULTRAVIOLET RADIATION
- NEW TYPES OF ELECTRON MULTIPLIERS
- MASS SPECTROMETRY

Final engineering and packaging are normally carried out by other groups in the organization.

The work is stimulating and satisfying in comfortable and pleasant surroundings in suburban Detroit.

Opportunities for advanced study.

Write or wire A. Capsalis,
Research Laboratories Division,
The Bendix Corporation
Southfield, Michigan

**Research Laboratories
Division**



An equal opportunity employer

the average student, having just acquired such a sketchy mathematical background, might have difficulties understanding fully Maxwell's equations or solutions to wave equations which form an important part of the rather extensive section on waves. There is a shorter section on statistical mechanics and thermodynamics which is probably out of place if we consider that the reader is to be a first-year student without adequate mathematical preparation.

There are many good illustrations and numerical examples in the text. Sets of problems, divided into easy, medium, and hard exercises, follow each chapter. Answers to the easy and hard problems are found in the back of the book. The table of contents lists 28 of the 30 chapters of the book.

This book should be classified among the various, somewhat unsuccessful, attempts at a noble goal: to teach the basic rules of a complex subject and, at the same time, to produce an over-all understanding of their deeper significance and their conceptual interrelations.

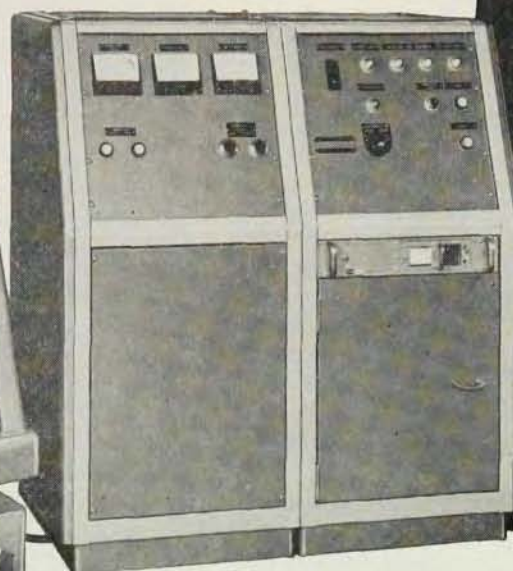
The Electron Microscope. The Present State of the Art. By M. E. Haine and V. E. Cosslett. 282 pp. Interscience Publishers, Inc., New York, 1961. \$9.25. Reviewed by L. Marton, National Bureau of Standards.

I READ with great interest Dr. Haine's new book written in collaboration with Dr. Cosslett, and I was ready to write a very complimentary book review when, by chance, the occasion arose to hand the book as an introduction to electron microscopy to a young budding electron microscopist. The result of this action was considerably less favorable than I expected. In fact, after having read half-a-dozen pages, the young man decided that he needed considerably more reading before tackling this book. Therefore, I went back and looked at it again and found some of his objections quite justified. Let me give you one example: On page 5, it is stated that focal length and focal distance are given in Fig. 1.6. The authors then proceed to define focal length but fail to give any indication of a definition of focal distance. This omission is remedied two or three pages later but by that time the beginner is lost and he will not understand that focal distance is the distance indicated as z_1 in Fig. 1.6. My test may have been unduly hard, as the "blurb" emphasizes that "the book will be found invaluable by practicing electron microscopists who wish to know more about their instruments and, in particular, about the optics of these". Nevertheless a good review of "the present state of the art" should not be too inaccessible to the beginner.

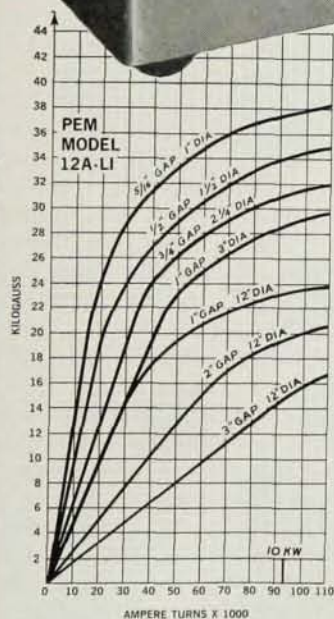
The book is highly readable and for those who have some background it is an enjoyable experience. Some may object to the choice of examples used by the authors. They discuss this in the preface, pointing out that they didn't attempt to be comprehensive. The "references have been chosen more in terms of illustra-

PEM Complete Magnet Systems featuring Transistorized Power Supplies

- ✓ **Higher Fields!**
- ✓ **Superior Uniformity!**
- ✓ **Precise Regulation!**



12A-LI Electromagnet



Illustrated: 12A-LI Electromagnet System. Includes magnet, "Q" Line power supply, N.M.R. equipment and water-to-water heat exchanger. Pole face windings available to increase volume of uniformity

Solid state circuitry yields important performance and maintenance advantages

"Q" Line transistorized power supplies, used in a complete PEM low impedance magnet system, yield unparalleled homogeneity and regulation. In sizes from 5 to 200 KW (larger sizes on request), they are current regulated and stable to 1 part in 100,000. Optimum regulation, minimum drift, and maintenance freedom are "built in" by PEM through use of temperature-controlled shunt and superb components throughout. Easy to operate: double closed loop design and clamp circuits eliminate damage through misuse. Conservative design includes water-cooled heat sinks to minimize heat dissipation into the room. Call or write for details.

POWER SUPPLY SPECIFICATIONS

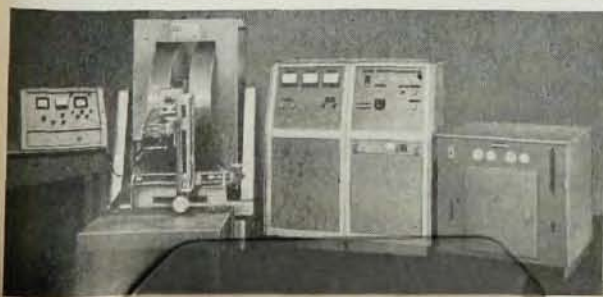
Current Regulation (voltage variation $\pm 10\%$) $\dots 1 \times 10^{-5}$
 Drift (long term) $\dots 1 \times 10^{-5}$ after $\frac{1}{2}$ hour warm-up
 Ripple $\dots \leq 1 \times 10^{-5}$
 For low impedance type magnet load $\dots$ Approx. .1 to 10 ohm loads.

SPECIAL MAGNET FEATURES

- (1) Complete surge and water flow protection.
- (2) 360° rotation about both vertical and horizontal axes.
- (3) Accepts up to 75 KW of continuous DC power.
- (4) Alignment provision for pole caps.

SYSTEM PERFORMANCE DATA (Uniformity)

- 1" air gap/12,000 gauss/12" dia.
 1 pt. $10^5 - 2"$ dia. cyl.
 1 pt. $10^4 - 7"$ dia. cyl.
 2" air gap/12,000 gauss/12" dia.
 1 pt. $10^5 - 1\frac{1}{2}"$ dia. cyl.
 1 pt. $10^4 - 4"$ dia. cyl.
 3" air gap/12,000 gauss/12" dia.
 1 pt. $10^5 - 1\frac{1}{8}"$ dia. cyl.
 1 pt. $10^4 - 2\frac{1}{4}"$ dia. cyl.



PEM

PACIFIC ELECTRIC MOTOR CO.

1009 - 66TH AVENUE, OAKLAND 21, CALIFORNIA • LOCKHAVEN 9-7621

PHYSICISTS OPTICS

This major electronics
research and development
company has an opening
for a scientist with a PhD
degree plus 5 years'
experience as a
professional
experimentalist.

Experience must be in a
field dealing with atoms
(not nuclei). Duties involve
research on new optical
masers working with a
small research group with
full facilities and
capabilities for original
research projects.

Qualified scientists are
invited to phone collect
(ROgers 9-5000) or write

Mr. Raymond P. Oakley.



**GPL DIVISION
GENERAL PRECISION, INC.**

63 Bedford Road, Pleasantville, N.Y.

An equal opportunity employer.

tion than of expansion" and "natural choice has been made of those papers prepared by the authors' close associates", rather than by authors working in other countries. This explains why practically all the design descriptions reflect only British and American development. German, Japanese, and other designs are hardly mentioned at all. If I had to express a wish at all I would propose that the authors reissue the book in an enlarged edition where they can take care of the many items that have been barely touched upon in the present little volume.

Atomic Age Physics. By Henry Semat and Harvey E. White. 230 pp. Rinehart & Co., Inc., New York, 1959. Paperbound \$2.00. *Reviewed by Norman Feather, University of Edinburgh.*

ALTHOUGH we read daily of new peaceful uses for atomic and nuclear energy, scientists themselves admit they are still on the threshold of significant discoveries"—so states the fourth sentence of the Foreword to this book. The sentence is sadly characteristic of the book as a whole: banal and a non sequitur to boot!

From that point, the authors (for they, sober scientists, not their publicity men, are responsible for the Foreword) plunge straight, in equally exaggerated terms, into politics, or, at least, into sociology. After the launching of Sputnik I, they say, "In this country the response was instantaneous. The interest in science . . . became even more intense. . . . The demand for physicists . . . spread as never before through colleges, universities, research organizations, and even industry. . . . The National Broadcasting Company . . . announced plans to help meet this need."

The book under review was produced as home reading for those who followed the second half of the course of television lectures which the NBC offered, on a nation-wide basis, in *Continental Classroom* in the winter of 1958, as first fruit of these plans. Its authors make the claim that it is also "an easy guide . . . that should prove useful to any student, irrespective of his level of familiarity with the subject." A reviewer in *Physics Today* will have fulfilled his duty if he examines this claim, ignoring wider issues.

Consider first the student with no previous knowledge of the subject—no more than that of the average television viewer to whom the original lectures were addressed. Such a student, it might be thought, makes the least exacting demands on our authors. But does he? Effective popularization of science is notoriously difficult. It is overwhelmingly important to get the feel of the thing right, from the beginning. Why, then, is the innocent learner told on page 1, "The earliest awareness of a concept of atoms dates from Democritus (b. 460 B.C.) who imagined these particles to be indivisible and to be the constituents of all matter"? Why, rather, is he not told, "Democritus was probably the first person to hold the view that ordinary matter cannot be subdivided without limit; ultimately,