

# engineers & scientists

*with exceptional  
abilities are invited  
to investigate  
opportunities with the*

## **Scientific Research Laboratories**

*of*

## **Brown Engineering Company, Inc.**

### **Current Openings Include:**

- PhD with experience in quantum electronics to direct research in lasers.
- MS or PhD for theoretical studies in hypersonic gas dynamics.
- PhD with a broad background in various aspects of theoretical and applied mechanics.
- MS or PhD with experience in microwave systems analysis.
- PhD in applied mathematics with experience using IBM 1410 or 7090 computers.
- MS or PhD with experience in advanced electro-optical systems and devices.
- MS or PhD for studies in chemical and nuclear propulsion systems.
- MS or PhD with experience in analysis of ICBM re-entry phenomena.

Submit your resume in confidence to: Raymond C. Watson, Jr.  
Director Of Scientific Research

**BROWN**  
Engineering Company, Inc.

P.O. Box Drawer 917-PT, Huntsville, Alabama  
An Equal Opportunity Employer

views the oxygen cathode. Chapter 4 by Fry and Dunn on ultrasound has considerable theory supplemented by photos and description of actualities. All six chapters of the book have various amounts of the detailed descriptive writing. The value of the treatise as a whole is enhanced by the accounting of minutiae of laboratory experience.

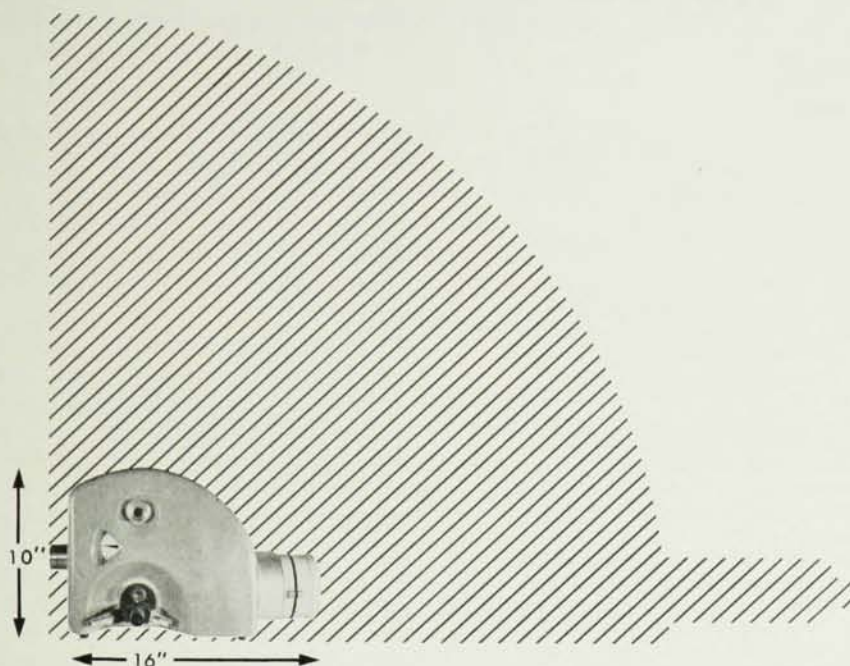
In very active areas of research, it may not be feasible to give detail. In that case, one enumerates the various methods, giving each a bold-face heading, a schematic diagram, two paragraphs, and the salient literature references. This method permits a listing of much general information, but it still refers the reader or student to the technical literature for a fuller picture. The text serves as a general critique and catalogue. One finds this method in Renkin's chapter on techniques of vascular perfusion, Margoshe's chapter on flame photometry, and in Otis's chapter on external respiration.

The purpose of the volume is well served by its excellent literature documentation, a generous number of diagrams, and graphs and tables. It is recommended to the worker in the life sciences particularly. The specialized material it presents is readily accessible because of its table of contents, author index, and subject index. Caution is advised about the symbols used: there are 3 lists of symbols: on page xiii, at the end of chapter 1, and at the end of chapter 6.

**An Introduction to Infrared Spectroscopy.** By Werner Brügel. Transl. from German by A. R. Katritzky and A. J. D. Katritzky. 419 pp. (Methuen, London) John Wiley and Sons, Inc., New York, 1962. \$9.00. Reviewed by T. H. Edwards, Michigan State University.

WERNER BRÜGEL has written a remarkably good introduction to the many aspects of infrared spectroscopy. It appears to be the best introductory text currently available and is heartily recommended to all those interested in infrared spectroscopy. The no-nonsense, no-waste chapters on the fundamentals of the theory are especially to be commended because of his judicious choice and understandable presentation of the subject matter. The sections on equipment and on quantitative analysis are also good and relatively detailed. Other useful topics included are those of sample preparation, chemical constitution, qualitative analysis, and the spectra of large molecules. A large bibliography of over 800 papers and 20 texts is given; however, they are not quite up to date, in that most of the newer books on the subject are not mentioned at all. Weaknesses in this edition are headed by the use of spectra obtained nearly 30 years ago as examples of the high-resolution spectra of small molecules, and by statements that certain quantities and effects are not observed or are not important; whereas, what is really meant (I hope) is that the effects are usually small in magnitude. There are also a few errors or departures from standard notation, e.g., the definition of intensity (page 31), the use of photo-electric rather than photo-conductive (pages 134, 139), and the use of dispersion where scat-

*The Shrinking Size of* HIGH-SPEED PHOTO INSTRUMENTATION



*Introducing*  
A New and Completely Portable  
Laboratory Rotating Mirror Framing Camera  
Model RMC-15F

- Frame Rates 20,000 to 1.2 million frames/second
- Automatic Rotor Overspeed Control
- Variable Stops over 8 to 1 Exposure range
- Non Oil-misting Rotor Design
- Fifteen Frames of Recording



WRITE FOR DETAILED SPECIFICATIONS, PRICE AND DELIVERY INFORMATION TO...

*KSM Division*

**ELECTRO-OPTICAL INSTRUMENTS INC.**

922 SOUTH MYRTLE AVENUE

ELLIOTT 9-9391

MONROVIA, CALIFORNIA



# \$12,845 and \$14,565\* for Advanced Research pivotmen

These are ideal (and permanent) positions for truly creative persons with sound research or teaching experience—Ph D. level or equivalent preferred—to guide a laboratory staff deeply involved in Submarines, Undersea Warfare, and Anti-Submarine Warfare.

*These are pivotal positions in that you will be in the center of, and responsible for, research in your specialty . . . but free from administrative tasks so as to apply your full talents to investigations and applications.*

If you are interested in kinematics . . . thermodynamics . . . hydraulics . . . friction and wear . . . surface phenomena on solids . . . micro-structure of materials . . . fatigue and corrosion . . . then you'll be interested in the U. S. Naval Engineering Experiment Station at Annapolis, Maryland. "EES", as it is becoming well-known, is responsible for developing advanced propulsion and auxiliary machinery, along with related materials and controls. Of particular importance to nuclear and fleet ballistic missile submarines is EES's work in suppressing machinery noise, ranging from correcting noisy components to stilling an entire machinery complex.

*\*Starting salaries are \$12,845 and \$14,565—depending upon your qualifications—with automatic raises to \$13,615 and \$15,665 on January 1st, 1964. These positions include the exclusive benefits of Career Civil Service—liberal vacations, holidays, and sick leave, participating health, retirement and life insurance, etc. You'll like working at EES, and living in this famous bayside resort . . . within one hour of Washington and Baltimore, and close to ocean resorts.*

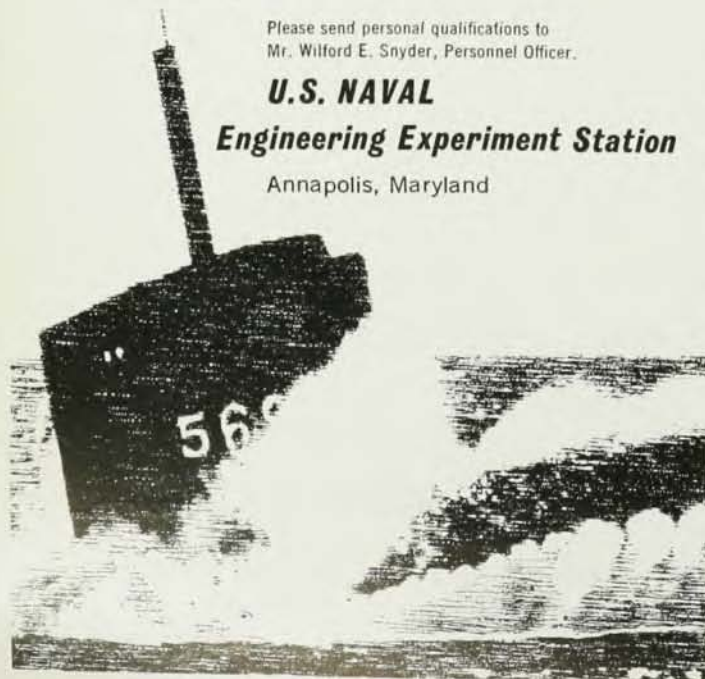
(Other positions are open for persons with less education or experience in the above, plus mechanical impedance . . . analytical mechanics . . . instrumentation . . . thermo-electricity . . . fuel cells . . . electrical machinery . . . ferro-magnetism and magnetic source prediction . . . optics . . . acoustics . . . engineering math and statistics.)

Please send personal qualifications to  
Mr. Wilford E. Snyder, Personnel Officer.

**U.S. NAVAL**

**Engineering Experiment Station**

Annapolis, Maryland



tering is meant (page 239). In addition, one thinks of important exceptions to some of the generalizations which are stated. In spite of these criticisms, the three editions which have already been published in Germany were well warranted, and this English edition may also be expected to be very successful.

**Introduction to Elementary Particle Physics.** By R. E. Marshak and E. C. G. Sudarshan. No. 11 of Tracts on Physics and Astronomy, edited by R. E. Marshak. 231 pp. Interscience Publishers, Inc., New York, 1961. Clothbound \$4.50, paperbound \$2.50. *Reviewed by Harold Mendlowitz, National Bureau of Standards.*

THE authors consider this book to be a continuation, in a sense, of a previous book entitled *Meson Physics*, written by the senior author. The field of elementary particles is pretty well covered up to 1961 and the book can serve as a quick reference to many of the basic ideas in this rapidly changing field. A second goal of the authors, that of addressing this book to the nonexpert in theoretical high-energy physics, is not quite achieved. The nonexpert in theoretical high-energy physics will find too many gaps in the explanations of a number of important concepts necessary for an understanding of the fundamental ideas underlying the discussions of the current problems in this field. Of course, for those people involved in the field, the discussions can be considered quite adequate. The newcomer to the field can, with the aid of the present volume and with reference to a good text on field theory, gain a good perspective of the problems and advances of present day high-energy physics.

**Mathematical Methods in Physics and Engineering.** By John W. Dettman. 323 pp. McGraw-Hill Book Co., Inc., New York, 1962. \$9.75. *Reviewed by Peter L. Balise, University of Washington.*

IN his preface, Dr. Dettman observes that students who plan to do graduate work in physics or engineering should, as undergraduates, take what has been traditionally called advanced calculus, followed by an applications course, for which his text is intended. In spite of this intent and the book's title, it is written strongly from the mathematics rather than applications viewpoint, particularly in comparison with many engineering-mathematics texts. Applications are frequently discussed, but without sacrificing mathematical rigor, so the book should perform the worthwhile service of attracting mathematics students to applied mathematics. Because of its clarity, the text should also be useful in physics and engineering curricula, although students here will need more mathematical maturity than is common at the undergraduate level.

The content as well as the exposition has a modern or advanced orientation. For example, the typical chapter on vector analysis is absent. Instead, after a review of the summation convention, the student is asked to

PHYSICS TODAY