Differential Equations. By HARRY W. REDDICK, the Cooper Union School of Engineering. ix + 245 pp. New York: John Wiley and Sons, Inc. 1943. $2.50.

BESIDES most of the standard methods of solving ordinary differential equations, this text includes a chapter on power series solutions. Many of the worked problems and numerous exercises deal with physical and engineering applications, including full numerical data. The explanations are given in more detail than is often the case. The author's interest in technical applications leads him to discuss linear equations with constant coefficients immediately after equations of the first order, and to omit envelope problems and singular solutions. The book is suitable for the peacetime undergraduate course in differential equations, and just now may prove useful in some of the army training courses which devote a few weeks to differential equations and their technical applications.

Plane and Spherical Trigonometry with Four-place Tables. By WILLIAM C. BRENKE, University of Nebraska. x + 269 pp. New York: The Dryden Press. 1943. $1.90.

THIS revision of an earlier text-book includes all the traditional contents of courses in plane and spherical trigonometry with applications to surveying and navigation, as well as several additional topics. Thus there is a chapter on vectors and one on the mil and its use in artillery problems. A three-place table of functions of angles in mils is given. The four-place tables include a table of haversines, as well as those usually given. Computation by logarithms is explained in an appendix, but there is no reference to use of the slide rule. The treatment throughout is clear and comprehensive. The book should prove useful as a text in many of the courses now taken by civilians or service men.

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PHOTOGRAPHIC REPRODUCTION

Principles of Photographic Reproduction. By CARL W. MILLER. New York: The Macmillan Company. xii + 353 pp. 132 figs. 1942. $4.50.

"PROBABLY no one will read this book who has not spent many hours with photographic manipulation and who does not covet the opportunity to spend many more."

Thus, in the preface, does Dr. Miller warn that his book is not one for the beginner in photography. On the other hand, this does not mean that the book throughout is highly technical and abstruse—understandable only to those who have spent years in photographic research.

Among men of science, there are many to whom photography is a hobby as well as a useful tool. To them the general processes of exposure, development and printing, both by projection and contact, are entirely familiar, but perhaps some of the more advanced methods are mysteries. To such persons, who would naturally want a work thoroughly scientific in its treatment, Dr. Miller's book should be most welcome.

The arrangement of the book is a logical one. There are three main parts; the first on drawing, the second on gradations, the third on color. The part on "Drawing," concerned with the way in which the image of the scene or object is produced, starts with the lens itself. Then come chapters on the size, location and brightness of the image, on supplementary lenses, perspective, depth of focus and the arrangement of subject material. The latter is an excellent simple account of the basic principles of composition, a subject with which the scientist-photographer might be least familiar.

The camera obscura yielded images long before there was any photography. The image must be perpetuated, and that is the subject of part two—"Gradations." After chapters on exposure and development, the print is discussed. The limitations of chloride and bromide printing papers lead naturally to means for individual control and then to such processes of the expert as platinotype and palladiotype, carbon, oil, gum, carbro and bromoil. The final chapter of this section is concerned with the preparation of transparencies and lantern slides, with which beautiful naturalness can be secured.

The third and last part deals with color—first the problems of representing color in monochrome, then of reproducing color itself, both by additive and subtractive methods. In the chapter on subtractive color photography, "because of the greater economy of thought in visualizing color processes and the ease with which essential calculations can be carried through," the matrix algebra is introduced. Enough explanation is given to acquaint the reader possessed of some mathematical background with its use.

Methods of making three-color separation negatives and of printing them, multilayer films (*e.g.*, Kodachrome and Agfacolor) and the use of masking and other refinements in the precision reproduction of color occupy most of the concluding chapters.

In case the book is to be used as a text in a course in advanced photography, a number of problems are contained in the appendix. These will also be useful for the person using it in self-study, particularly as the answers are given. Four-place logarithms and anti-logarithms are included as well as a table of weights and measures, references to the literature

and a complete index. At the end of each chapter where photographic processes are discussed there is a formulary, giving the recipes for the various developers, toners, intensifiers, bleachers, etc.

Finally, the illustrations should be commended. Many of these clearly show the techniques described in the text. Scattered throughout there are also a number of beautifully reproduced examples of the photographic art, some in color. Since these are not credited to any photographer, they are presumably the work of the author himself. As such they demonstrate that he can apply these methods as skillfully as he can write about them.

JAMES STOKLEY

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

RESOLUTION OF THE COUNCIL ON THE SCIENCE MOBILIZATION BILL (S.702)

THERE is now pending in the United States Senate the Kilgore Bill (S.702), entitled "A bill to mobilize the scientific and technical resources of the Nation, to establish an Office of Scientific and Technical Mobilization, and for other purposes." This pending bill is so sweeping in character and will affect science and scientists in so many ways that it merits careful consideration by the American Association for the Advancement of Science, the most broadly representative scientific organization in the United States. In examining the purposes and provisions of Bill S.702 it will be convenient to follow the 12 sections into which it is divided, and to point out which of the provisions are to be effective in time of peace as well as in time of war.

Section 1 recites, first, the reasons for the bill, effective both in time of war and in time of peace. In enumerating the "serious impediments" to the "full development and application of the Nation's scientific and technical resources," the bill uses such terms as "unassembled and uncoordinated state of information," "unplanned and improvident training, development, and use, of scientific and technical personnel . . .," "delay and ineffectiveness in meeting urgent scientific and technical problems. . . ."

As to information about scientists, it is always available in the membership lists of scientific societies in every special field to a total of more than 500,000 names, in the membership list of the American Association for the Advancement of Science (25,000), in "American Men of Science" (28,000) and in the National Roster of Scientific and Specialized Personnel (500,000). As to information about scientific work, scores of scientific journals covering together every important field of science are published regularly in the United States. Moreover, abstracts and reviews of practically all the current literature of the world are available in a number of such publications as *Biological Abstracts* and *Chemical Abstracts,* each of which publishes about 25,000 abstracts annually.

As to "delay and ineffectiveness in meeting urgent scientific and technical problems," in 1863, at the instance of scientists of the United States, the National Academy of Sciences was established by an act of Congress which provided that the academy shall, without conpensation, advise the Government on scientific questions, an obligation that the academy has unfailingly fulfilled. The first world war began in August, 1914. Although President Wilson enjoined the citizens of the United States to remain strictly neutral in thoughts as well as in acts, in May, 1915, leading scientists of the country, realizing the nature of the storm in Europe, began to organize the scientists of the nation for service to the Government on a more comprehensive scale than could be provided under the limited membership of the academy. In March, 1916, a year before this country entered the war, President Wilson established the National Research Council by Executive Order as an agency of the National Academy of Sciences. It promptly effected an organization and prepared to respond to any calls the Government might make on scientists. The contributions of the National Research Council to the war in 1917–18 and to the national welfare during all the intervening years to the present have been enormous. It is now serving the Government through about 200 committees composed of more than 1,000 scientists. On June 28, 1941, President Roosevelt established by Executive Order the Office of Scientific Research and Development, completely under the administration of scientists. It has formulated plans for research on war problems and entered into contracts with university, research organizations and industrial laboratories which have entailed an expenditure of $188,000,000, all on a non-profit basis. The products resulting from these researches have been ordered through regular governmental channels under contracts amounting to $2,000,000,000. All this has been accomplished without discord, reorganization or the necessity of executive intervention. In addition to these activities, the principal scientific societies have appointed special committees for the investigation of war and defense problems in their respective fields and through which governmental agencies at any time can promptly obtain scientific information and competent personnel. In the face of such achieve-