other communities where similar activities may be instituted. Acting on the assumption that a part of the support accorded the antivivisectionists by the lay public is based on misinformation, an extensive public education program was undertaken.

This campaign was carried on by means of public addresses, debates, radio talks, distribution of literature and personal letters. Over one hundred addresses were made before women's clubs, business men's organizations, Parent-Teacher groups, church groups, high school and junior college groups, college alumni organizations and open meetings. A number of public debates were held in which both sides were represented. Through cooperation with various medical and other professional organizations, more than thirty radio programs were presented. Some of these were brief, concise discussions of the results of animal experimentation and the significance thereof to society; others were presented as a forum or dialogue. Practically every radio station in Chicago gave free time.

Reprints of published articles, specially prepared mimeographed discussions and other literature were widely distributed. At a conservative estimate more than 100,000 pages of such material were distributed. Contrary to the conventional views about such procedures, the response was such as to indicate that the general public did display an intelligent understanding of the problem. With the exception of one of the Hearst publications the newspapers in general gave sympathetic support to the society's efforts.

While many physicians and lay people, both men and women, participated in the campaign and rendered valuable assistance, the brunt of the work fell upon the active members of the society, and of these the most active and most effective were Drs. Luckhardt, Carlson, Ivy, Visscher, Boyd and Thalhimer, who made up the nucleus of the very widely extended organization which finally accomplished the defeat, locally, of this pernicious attack on scientific research.

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SCIENTIFIC BOOKS

ELECTRONS

Electrons (+ and −), Protons, Photons, Neutrons, and Cosmic Rays. By R. A. MILLIKAN. The University of Chicago Press. 492 pp. Price $3.50.

THIS new book may be regarded as a third edition of "The Electron," which appeared in 1917, but six new chapters have been added on "Waves and Particles," "The Discovery and Origin of the Cosmic Rays," "The Spinning Electron," "The Positron," "The Neutron and the Transmutation of the Elements" and on "The Nature of the Cosmic Rays." The new chapters contain many excellent illustrations.

Like the first edition the third is largely devoted to the researches of the author and his coworkers. It contains besides enough about the work of other physicists to enable the reader to appreciate the bearing of the author's work on theirs.

This book is admirable and most interesting. It is well written and not too technical. It should enable a reader with very little scientific knowledge to get some real insight into the recent rapid advance in physical science to which the author and his associates have contributed so much. The author describes his own experiments and the wonderful technique with which he overcomes extraordinary difficulties and obtains exact results where previous investigators have been content with little better than qualitative indications. It is a record of a splendid series of researches all so well done that the results are likely to stand unchallenged for many years. No better book could be given to an undergraduate thinking of taking up physics seriously. The intensely interesting and surprising character of the recent experimental and theoretical advances discussed should appeal to the imagination and ambition. Above all the author makes it clear that physics is a living subject advancing with ever-increasing speed and that it will surely reward the seeker after truth as richly as he deserves. No one can doubt that the next twenty years will bring forth new facts and theories which will change civilization as much or more than Faraday's researches in the nineteenth century.

H. A. W.

WILD FLOWERS

Wild Flowers. By HOMER D. HOUSE. 362 pp. 299 illustrations; 264 colored, 35 half-tone. The Macmillan Company. Price $7.50.

ONE of the most needed types of flora is one with accurate photographic illustrations from which plants may be identified so far as to superficial characters. While this has been done before in certain groups of plants, House's "Wild Flowers" makes a step in this direction for the floristics of a large area. While a great deal of the book, especially the illustrations, is a reissue of a New York State Museum publication, in its present state it is more convenient for use and available to a greater public. The size and clarity of the illustrations make identification much easier for such plants as are included, and make one wish that more than 400 out of the many thousand plants that

grow within the area the book is said to cover had been so illustrated. That of course would make too expensive and bulky a book; in fact, it would have to run to several volumes, so one must be contented with the quantity illustrated in the present work.

Mr. House's simple clarity of description and interesting form of writing must be taken as compensation for the faulty reproductions of color in the illustrations, where the greens are especially bad, the yellows frequently too orange and the pinks and purples too weak or dull. This is possibly due in part to the imperfections of color photography, which, while satisfactory enough in many ways, still has the unsatisfactory tendency to reduce colors to monotones, not having reached the state of perfection where all tones and shades of color can be reproduced.

The rather rash promise made on the inside of the jacket that any wild flower may be quickly and easily identified by the use of this book is regrettable. Whether this statement is intended to apply to any wild flower in the United States is doubtful, but since the plants included are nearly all northeastern except for the wide-spread introduced weeds, the book is clearly applicable to that region, in which between 4,500 and 5,000 species and varieties of plants are known. Grasses, sedges, rushes and trees are omitted, probably for the popular reason of not thinking of them as wild flowers, an acceptable enough reason in a book intended for popular use, since these groups are too difficult for the average person to identify. The book, however, is such an excellent pioneer in its type of field that it becomes a fine book of reference for flower-lovers.

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THE DIATOMACEAE

An Index to the Genera and Species of the Diatomaceae and Their Synonyms, 1816–1932. By FREDERICK W. MILLS. Pts. 1–21. Wheldon and Wesley, London, 1933–1935, 1726 pp., 1 portrait.

INDEXES and bibliographies constitute some of the most valuable tools of the research worker, yet their preparation seems always to lag far behind. Some of the difficulties seem to be associated with the means of publication. A few librarians recognize the usefulness of such works for reference purposes, and specialists in particular groups acquire them, but in general they are overlooked to such an extent that publishers can not afford to risk the financial loss connected with the printing.

In the present case Mr. Mills has devoted a long life to the preparation of this index. Naturally it is not perfect; no index ever is, but he did manage to assemble some half a million important references to the literature. In order to make publication possible at all it was printed by the "multitype" (mimeograph) process and this may prove to be the solution of the problem facing many authors of reference works, only small editions of which are needed.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

A MODIFIED MEDIUM FOR THE STUDY OF INTESTINAL LACTOBACILLI

FOR the cultivation of the Lactobacillus group of organisms many different kinds of special media are available, the selection depending entirely upon the purposes in view and the types of Lactobacilli studied. In this laboratory the Bacto-Peptone tomato agar, a modification of Kulp and White's medium,[1] has been employed for several years as a plating medium in the isolation and study of intestinal lactobacilli. In this medium, under properly established gaseous environment, the characteristic filamentous colonies (fuzzy X type) of *L. acidophilus* are usually obtained. The colonies remain quite small, however, and are difficult to differentiate from other microscopic colonies present.

Recently we have used Neo-Peptone (Difco) in preparing the tomato agar and have found it to offer considerable advantage in the plating of *L. acidophilus* of intestinal origin. In comparative quantitative experiments the following differences were obtained in favor of Neo-Peptone tomato agar, as compared to those obtained on the same medium prepared with Bacto-Peptone.

The results presented in Table I were obtained with pure culture strains of *L. acidophilus* in milk. The increases in plate counts varied from 12.3 to 166.0 per cent. In a general way the stimulation was most noticeable with the strains which showed the lowest plate counts in Bacto-Peptone tomato agar.

Additional evidence (not presented in the table) was obtained in quantitative platings of rat feces. From 10 to 30 per cent. higher *L. acidophilus* counts were invariably the rule in Neo-Peptone tomato agar. The medium was especially advantageous for determining the *L. acidophilus* ratio to other bacteria in feces of white rats kept on various diets. Due to their increased size and enhanced filamentous characteristic,

[1] SCIENCE, 76: 17, 1932.