frequently hear of its bearing good fruit in campaigns. In our society, either as officers or on the advisory boards, are many men of broad influence in the country. Among these the earliest to go into the movement, inspired by the entomologist before referred to, were Matheson, Kerr, Miller, Hoyt, Cravath, Rand and Wetmore —business men of largest affairs.

We have got such men together, with many others known over the world, into a society, which, according to its constitution, seeks 'to unite in a general body, persons believing in the various great evils resulting from the unrestrained breeding of mosquitoes in civilized sections, and in the practicability of their extermination therefrom, by private and public systematic operations.'

For these worthy objects we ask your active cooperation with us and in closing thank you for your attention.

(To be continued.)

SCIENTIFIC BOOKS.

The Analytical Theory of Light. By JAMES WALKER. New York, The Macmillan Company. Pp. xv + 412. $5 net.

The Electromagnetic Theory of Light. By CHARLES EMERSON CURRY. New York, The Macmillan Company. Part I. Pp. xv + 400.

Walker's 'Analytical Theory of Light' is, perhaps, the most complete treatment of the subject so far attempted from the standpoint of the general wave theory, without any special assumption as to the character of the waves or the nature of the transmitting medium. With this restriction in mind, it is not surprising to find relatively much more space given to the older and more worked-over parts of the subject, such as interference, diffraction, isotropic and crystalline reflection and refraction and the interference of polarized light, as contrasted with absorption, dispersion and magneto-optics, those portions which at present seem more fruitful of interesting and important results. While the book is built on a rigorous analytical framework, nevertheless frequent comparison with experimental facts, and more sparing application of theory to instrumental methods keep the reader in touch with the physical side of the subject—to which end numerous references to the literature of the various special fields also assist. The book is written in a clear and attractive style, and its value as a reference work is increased by an index as well as by appendices dealing with the properties of Bessel's, Struve's and Lommel's functions.

It is in one sense hardly fair to criticize a book because it is too exactly what its author intended it to be; at least one should, while questioning his judgment, commend his pertinacity of purpose. This applies to the second of the above books, Part I. of Curry's 'Electromagnetic Theory of Light,' in which, as is stated in the preface, 'empirical facts' are referred to 'only where a comparison with theoretical results seemed of interest.' One must regret that so few cases 'seemed of interest'—for the result is a book unnecessarily abstract, which, while entirely modern in treatment, and sufficiently cognizant of recent theoretical discussions, is out of touch with the experimental side of the science. While this general method of treatment has been most successfully applied to the more finished science of mechanics, it hardly seems at present the best for the less developed field of optics. This point of view is, perhaps, responsible for one or two rather amusing misstatements, as for instance (p. 13) that the varying sensibility of the eye to different wave-lengths, follows because the usual expression for the intensity of a ray of light

$$\left(I = \frac{m\pi^2\nu^2a^2}{\lambda^2}\right)$$

contains the wave-length.

The treatment is throughout based on the electro-magnetic theory of Maxwell, but a very considerable amount of space is given to the discussion of 'primary' and 'secondary' waves, the exact definition of which and their special treatment is due to the author. Aside from this the ground covered is about the same as in the earlier chapters of Walker's treatise, with, however, emphasis laid on dif-

ferent points. Besides the introductory chapters there are the following headings: General Polarized Oscillations, Interference, Huyghen's Principle, Diffraction, Reflection and Refraction at Isotropic Media, and Propagation of Waves through Crystalline Media. In accordance with the general plan mentioned above, no application of theory to instrumental methods is anywhere given. The large amount of ground left for the second part will, if covered in the same detail, make the treatise as a whole the most ambitious and extensive available in English; and while one can not but admire the power and generality of treatment, to the present reviewer, at least, the book seems greatly handicapped by the attitude already referred to and by a certain rather formidable style.

C. E. M.

Madison, Wis.,
February, 1906.

Catalogue of the Crosby Brown Collection of Musical Instruments of all Nations. IV., Historical Groups. Gallery 39. New York, The Metropolitan Museum of Art. 1905. Pp. xvii + 168; pl. 12, partly folded.

Earlier parts of the catalogue of this rich collection have been reviewed in Science. The present volume deals with a fifth gallery opened to the public in 1903. The exhibits in it include: (1) a number of prehistoric instruments, originals or copies; (2) a dozen plaster casts of ancient sculptures showing musical instruments; (3) about 230 drawings of instruments used from the earliest times to the thirteenth century A.D., grouped by types and countries to the east or west of Assyria and Egypt; (4) the leading European instruments with their kindred forms in different countries; (5) details of the construction of the violin, flute, cornet, piano and organ; (6) some keyboard instruments, in part recently acquired, showing especially the development of the piano and several of the earliest American pianos.

The mere enumeration of these groups shows that a new stage has been reached in the history of the great collection. Begun merely with the purpose of decorating a music room, it soon outgrew private walls and came to include nearly every existing kind of instrument that could be obtained. These were classified, catalogued and described. But the collection lacked specimens of the almost unobtainable instruments of ancient and prehistoric times. This gap is now at least partly filled by the many reproductions and drawings. These latter are of great variety, value and interest; the list of books from which figures are copied is a long one; but too many of the 'authorities' get their illustrations at second-hand instead of first-hand, and copies are rarely accurate; the addition or omission of a line by a draftsman who does not thoroughly understand the instrument not infrequently makes the figure unintelligible or misleading. It is unfortunate that the most easily accessible references are the voluminous and rather antiquated books by the uncritical Carl Engel.

A peculiarly interesting feature is the collection of partly-finished instruments of the five kinds named above, with the tools and specimens of materials used in their manufacture; all the parts are carefully named and the exhibit is accompanied by technical descriptions. All this recalls the remarkably full and accurate descriptions of all arts and industries in the great French Encyclopédie before the Revolution. The models of a tubular pneumatic and an electro-pneumatic action for organs are very perfect and illustrative.

This volume impresses the reader as marking an advance over the earlier ones; there was here opportunity for a more comprehensive grouping of instruments illustrating the long story of musical development, and the opportunity has been well used; therefore, much of the book is as useful to the reader anywhere as to the visitor. The copious bibliography and several full indexes are noteworthy. Acknowledgments are again made to Mr. Galpin, of England, and for the first time to Miss Fannie Morris, who has done a large part of the work on all the catalogues.

This series of catalogues being now, we believe, completed, one looks forward with interest to see in what way the collection will be utilized by the donor, the authorities or