metrical methods, the sign convention being made clear. The "power" of a lens is defined, and attention is directed to the optician's mode of calling a convex lens positive. "Dispersion," "the eye," and "defects of vision" are very clearly treated.

The first six chapters in the volume on "Sound" are devoted to vibratory and wave motion, and the author has succeeded in giving a very clear, and at the same time elementary, exposition of these somewhat difficult subjects for the beginner.

The three volumes form a suitable introduction to the study of physics.

(2) This book is intended for use in schools where a four years' course is given as outlined by the present regulations of the Board of Education. The book is divided into three parts. Part i. represents a first term's work in geometry and physics; part ii. a second and third term's work in geometry; part iii. a second and third term's work in physics. The book is a copious collection of examples and practical exercises in illustration of the chief elementary geometrical properties of the straight line, parallels, triangles, quadrilaterals, polygons, and circles. The construction and use of scales, graphs, measurements of length, area, volume, and density are also dealt with. No instructions are given as to the method of using the instruments employed in performing the various exercises. These are left for the teacher to supply. The book should prove extremely useful as a class-book, the multiplicity and variety of the exercises being a boon to any teacher for purposes either of work in class, in the laboratory, or at home.

(3) These are two elementary laboratory text-books forming, as their titles imply, a second and third years' course in practical physics for schools. The second year's manual deals chiefly with heat, and contains descriptions of methods of performing upwards of seventy experiments, the subjects treated including thermometry, measurement of coefficients of expansion, calorimetry, conduction, convection, radiation, solution, distillation, and crystallisation. In addition, questions and supplementary exercises are given after many of the experiments. The book strikes one as being hurriedly compiled, the diagrams in very few instances being referred to in the text. Again, on p. 81 a wire 12 in. long $\frac{3}{32}$ in. diameter is to be bent 2 cm. from the end. Is such confusion intended? The experiments described on conduction and radiation are novel, use being made of an indicating paint prepared by Mr. Walter Jamieson. This paint, which is colourless at ordinary temperatures, turns green when heated, the green colour disappearing on cooling. The range of sensitiveness may be from 80° C. to 21° C. Objection must be raised to the designation of the curve in the diagram on p. 82 as "heat-curve." Temperature-gradient would be better. We must disagree with the remark on p. 42, footnote; it is certain a boy will be more readily convinced of the anomalous expansion of water by use of the apparatus described in the text (previously described by Mr. H. E. Hadley in the *School World* for June, 1901) than by the performance of Hope's experiment. The diagram of the constant volume air

thermometer on p. 53 is unnecessarily complicated, and does not appear any more exact than that on p. 50.

The third year's course is devoted entirely to optics, and is similar in plan to the manual on heat. There are upwards of fifty experiments which may be performed with simple apparatus, and the book contains many supplementary exercises and questions. Experiments 6, 7, 8, pp. 11-19, on photometry are misleading, viz., "To find the relation between the illuminating power and the distance of sources of light." The "intensity of illumination" at a point due to a given source will vary with the distance, but the "illuminating power" of the source remains the same.

OUR BOOK SHELF.

The Mechanism of Speech. Lectures delivered before the American Association to promote the Teaching of Speech to the Deaf by Alexander Graham Bell. Second edition. Pp. xv+133. (New York and London: Funk and Wagnall's Company, 1907.) Price 1.20 dollars net.

THIS is the second edition of a work already reviewed in NATURE, December 27, 1906 (vol. lxxv., p. 196). The first edition was printed during the author's absence in Europe, and he had no opportunity of revising the proofs. As the printers could scarcely be expected to be familiar with the somewhat complicated symbols used by the author's father, Melville Bell, a number of typographical mistakes had crept in. These have now been corrected. A full account is given of Mr. Melville Bell's ingenious system of symbols, which are intended to express the position of various parts of the vocal apparatus in the production of articulate sounds, and illustrations are afforded of the methods by which deaf children can be led to understand the meaning of these symbols, and are thus guided in the operation of placing their vocal organs in the position required for a given word. By patient training and by following the judicious maxims of Mr. Graham Bell a wonderful degree of success has been attained in the education of the deaf.

Mr. Melville Bell's symbols express words, not in letters, nor in the wave vibrations revealed by the phonograph or gramophone, but in forms that indicate precisely the physiological position of the articulating mechanism necessary for the production of a given sound. A first glance at these strange symbols gives one the impression of the system being too complex for practical purposes, but with the aid of Mr. Graham Bell's instructions it soon becomes easy. The writer in a short time found that he could both write and interpret the symbols. One can readily see how the system might be of use to travellers, as, by means of the symbols, they could write down the sounds of an unknown tongue and reproduce them. A knowledge of this system and the use of a phonograph would be invaluable to those who desire to register the articulate expressions of savage tribes.

JOHN G. MCKENDRICK.

The Moths of the British Isles. By Richard South. First Series, containing the Families Sphingidæ to Noctuidæ. Pp. vi+343, plates 159, text-figures 24. (London: F. Warne and Co., 1907.) Price 7s. 6d. net.

BOOKS on British butterflies and moths are now plentiful enough, but we have never seen any which have pleased us so well as the series of which this book is the second volume. It is true that technicali-