great benefits have already been derived by the community at large from the two services acting in unison. It is further stated in regard to marine meteorology that the navy can now be kept conversant with the latest information touching upon this important subject, the serious study of which had been neglected by the department for many years. One of the reforms of the office has been the establishing on a permanent footing of this division, where the collection and dissemination of data could be carried on without interruption, and where instructions for the service could be prepared and revised in accordance with the progress of the science of meteorology. It is suggested that the Navy Department should establish stations throughout the West Indies, and, in co-operation with the Signal Service, bring the subject of West Indian hurricane warnings to a greater degree of perfection.

The policy of the office in encouraging its employees to improve the character of their work, either by the invention of apparatus or in the preparation of original matter in manuscript, has shown remarkably good results, as have also the efforts made to improve the chart service to ships of war. It is concisely pointed out where improvements can be made in this latter feature, and recommendations are submitted that are well calculated to secure in the near future a still better service. It is also hoped that with the increase in the number of charts, and the augmentation of our foreign commerce, the revenue derived from the increased sale of charts will finally result in making the office self-supporting.

Considerable attention is paid to the subject of the international marine conference, and to the collection by the branch offices of material of value placed before the United States delegates for their consideration; and it is confidently believed that the publicity given to the subject of floating wrecks, fogs, ice, safe routes, and so forth, by the monthly "Pilot Charts" and by the branch offices, has had an important bearing upon the bringing-together of the delegates forming the conference. At the same time full credit is given to Mr. Francis Houghton, superintendent of the Maritime Exchange of New York, to whose active and efficient management is mainly due the passage of the act of Congress creating the conference.

It is suggested that all naval surveying work be under the immediate supervision of the Hydrographic Office, as it is thought that greater economy is possible by such an arrangement, and that the requisite degree of efficiency can only be attained by uniting all the functions of a surveying office with those that the Hydrographic Office possesses at present. A surveying branch being considered a necessary part of the naval establishment, it is thought that special inducements must be held out to officers who are willing to take up this work; and it is hoped that the days for perfunctory service in the Hydrographic Office have departed.

The system of branch offices having proved its great value to the maritime community, its extension is recommended to include every shipping port of importance on our coasts. It is thought by so doing that the Navy Department can maintain itself as the natural leader in all subjects of a hydrographic nature, to which the best interest of the government and the technical education of its officers clearly entitle it.

It is recommended to erect a separate and specially constructed building for the use of the office, the necessity of having commodious and well-lighted rooms for draughtsmen and engravers being obvious. Series of charts for China and the East, a pilot chart for the Pacific, and permanent parties for the determination of the earth's magnetism, together with more extended surveys of those portions of the world in which our trade is active and growing, are all points well worthy of the enacting clause of Congress.

BOOK-REVIEWS.

Hygiene and Public Health. By LOUIS C. PARKES, M.D. Philadelphia, Blakiston. 12°. $2.50.

DR. PARKES comes before us indorsed as the assistant professor of hygiene and public health at University College, London; and he assures us that it is as a result of his experience as a teacher at that institution that he was led to believe that a small book, clearly written, on hygiene, would serve a good purpose. The author has aimed to cover the whole field of sanitary science, and has given such elementary information on every topic as will enable the reader to refer with advantage to the larger text-books.

The necessity under which health-officers often find themselves of dealing with figures and statistics has induced Dr. Parkes to introduce as a closing chapter a discussion of statistics, and how to handle them in so far as they are likely to be of value to those whom he aims to assist. Medical men find trouble in this mathematical part of their work, and will be interested in this novel chapter.

As good drainage is all-important for the preservation of public health, we find Dr. Parkes has devoted considerable space to the methods of disposal of refuse.

The opening chapter is, however, on water. It is one of the longest, and is written with the good judgment displayed throughout the book.

The other chapters are on ventilation, warming and lighting, climate (in which it is possible undue attention is given occasionally to matters which might be assumed as known), soils and building-sites (a chapter likely to interest many), exercise, and contagion. Throughout, the book is written so as to be interesting and intelligible to laymen and doctors alike, and we take pleasure in calling attention to it.

Alternate-Current Machinery. By GISBERT KAPP. New York, Van Nostrand. 24°. 50 cents.

THIS timely little volume had its origin in a paper read before the Institute of Civil Engineers, London, by Mr. Kapp, whose name and reputation as an electrician are well known to all interested in the progress of electrical science. It is reprinted, in convenient pocket form, from the minutes of the proceedings of the society before which it was read, and contains, besides Mr. Kapp's paper, the comments and criticisms made upon it by many eminent electricians, members of the institute, and Mr. Kapp's replies and explanations. The book appears at an opportune moment, as the matter it contains derives additional interest from the fact that the sharp competition at present existing between advocates of the direct-current and those of the alternate-current systems of electric lighting is compelling closer attention to all that is published concerning both systems, or groups of systems.

The subject comprised under the title of the work is divided by the author into six sub-sections: 1. Alternators; 2. Transformers; 3. Motors; 4. Meters; 5. Mains; 6. Accessory apparatus for use in central stations and on the premises of the persons supplied with current from such stations. The question of lamps Mr. Kapp considers as somewhat foreign to the subject under consideration, as glow, or incandescent, lamps are equally suitable to be fed by alternating and direct currents, and arc lamps are adapted to either current by changes easily made. Alternators, transformers, and motors, — the three main points, — of course receive more attention from Mr. Kapp than the subsidiary ones, though no point has been left far in the background.

A Handbook of Descriptive and Practical Astronomy. I. The Sun, Planets, and Comets. By GEORGE F. CHAMBERS. 4th ed. Oxford, Clarendon Press. 8°. $3.

NEARLY thirty years ago Mr. Chambers had ready the first edition of this handbook, which was designed as a handbook that should be attractive to the general reader and of occasional service to the professional astronomer. The author aimed to make a book that should be popular without being vapid, and scientific without being unduly technical. That he was reasonably successful we all know.

A second edition followed in 1861, and a third in 1876. And it should be called to mind that this was the work of an English barrister, who could spare for his hobby, as it were, but a part of his time, mainly absorbed by his professional engagements.

The volume we have before us is the first volume of the fourth edition. The plan at first was to break the work up into two volumes, but the material proved so large in amount that three were finally decided upon; and the author finds himself in a position where he can carry out his original conception of what such a treatise should be.

In this volume we have the descriptive astronomy of the sun,