ods of the Bureau of Ordnance and of the Bureau of Construction are studied and used after the main course is completed."

One hundred and five of the hundred and ninety pages are devoted to a description of the drawing outfit, and to general directions as to its use. This portion alone is, fortunately, worth the cost of the book, for without the sectional models, which are referred to in the later pages and which form so valuable a feature of the Annapolis system, the outside student can hardly derive all the discipline intended from a course based on this work. Preliminary to the work from models two sheets of elementary plane figures are required, the first containing eighteen three-inch squares, filled with straight-line designs only. The second sheet affords about the same amount of practice with compass and irregular curves.

The book is well and practically illustrated, except in the matter of lettering, in which a standard far too low is set for Government work, not comparing at all favorably with that either of the leading bridge and locomotive companies, or of the draftsmen of the Coast and Geodetic Survey. As a whole, the book is a valuable addition to the literature of graphic science, and is likely to prove especially useful to teachers as a reference work.

Frederick N. Willson.

Princeton, N. J.

Preliminary Catalogue of the Crosby-Brown Collection of Musical Instruments of All Nations. I. New York, The Metropolitan Museum of Art, 1901. 8vo. Pp. 94, pl. 12.

This little work deserves a hearty welcome both for what it is and for what it forecasts in the future. All persons interested in tracing human development through the ages should know of this splendid collection of more than 2,500 instruments, nearly all presented by Mrs. John Crosby-Brown; the more one knows of it, the more he will feel the need of interpretation. This need is partly met in the sumptuous volume published in 1888 by Mrs. Brown and her son, Professor William Adams Brown, 'Musical Instruments and Their Homes.' Necessarily the work was mainly a compilation from writers of all degrees of competency, and since its date considerable new matter has become available, especially on the scientific side of the subject.

The present pamphlet has a more modest aim. It is a Catalogue of Gallery 27, which contains the Asiatic instruments. Great care has been taken to get the names properly spelled. The arrangement is first by countries, and then by cases; generally a very few lines of description and the dimensions of the instrument follow each title; there is no musical notation. The page is clear, the matter well displayed, and the proof-reading excellent. A full index of names, native and English, is provided. Twelve fine half-tone plates add much to the value of the book, and furnish beauty and instruction to those who cannot visit the Museum. Two of the plates show the Cristofori piano, the finer of the only two existing instruments made by the inventor of the piano. Of great interest to the student of scales is the half-page view of case 11, showing nearly twenty Japanese flutes with equally spaced holes, and several Pan's-pipes and xylophones that display a rectilinear or symmetrical construction, rather than a conformity to a law of reciprocals like ours. Those who believe there has been a universal desire for a diatonic scale will find it difficult to explain or explain away the facts that confront them in this case.

The future instalments of this catalogue will be awaited with interest; and when it is completed we trust the author's hope may be realized 'to issue an illustrated catalogue in which full justice shall be done to the many features of interest in the collection.' For 'full justice' means a work such as has never been attemped—such a work needs not merely a musician as Fètis or Engel or an instrument maker like Mahillon, but it needs the cooperation of the archeologist and ethnologist, the physicist, the philologist and the psychologist; and if the philosopher and the artist feel that they too have something to add to the understanding of musical instruments and of the men that made and used them, who shall deny the claim? The unprecedented opportunity before the Metropolitan Museum

and its liberal patron leads one to look for results far more full and satisfying than have yet been secured.

CHARLES K. WEAD.

SCIENTIFIC JOURNALS AND ARTICLES.

The Popular Science Monthly for June contains a series of papers 'On the Definition of some Modern Sciences,' presented originally before the Philosophical Society of Washington. The 'Introduction' is by W. H. Dall; Carroll D. Wright defines 'Statistics,' Roland P. Falkner 'Political Economy,' E. A. Pace 'Psychology' and Lester F. Ward 'Sociology.' Marshall O. Leighton discusses 'The Commercial Value of Human Life,' concluding that the pecuniary value of life is subject to the same economic laws as are applied to other commodities. 'Instinct' by Douglas A. Spaulding is a reprint of much value, as it contains the record of a series of important experiments on young birds which seem to prove that instinct is indeed inherited memory. Arthur C. Scott has an article on the 'Educational Value of Photomicrography,' describing some of the methods used and showing some of the results obtained. John Waddell considers 'Sugar and the Sugar Beet,' stating that the profits of beet raising average twenty dollars per acre. There is a biographical sketch of 'Peter Guthrie Tait' by C. K. Edmunds and J. McKeen Cattell presents some very decided ideas 'Concerning the American University.' There are also some good brief articles under 'The Progress of Science.'

IN *The American Naturalist* for May Henry F. Osborn discusses 'The Law of Adaptive Radiation,' the differentiation of habit in several directions from a primitive type. One of the conclusions reached is that function precedes structure. Charles T. Brues describes some 'New and Little Known Guests of the Texan Legionary Ants,' and in 'The Structure and Classification of the Trematapidæ' William Patten presents the evidence for the arthropod affinities of the primitive 'fishes,' proposing for *Pterichthys* and allied forms the new class Peltacephala. Elliot W. Downing considers 'Variation in the Position of the Adductor Muscles of *Anadonta grandis* Say.' The number contains the Quarterly Record of Gifts, Appointments, Retirements and Deaths.

The Plant World for April contains 'Suggestions for the Preservation of Our Native Plants' by F. H. Knowlton, 'Among Florida Ferns' by A. H. Curtiss and shorter articles and reviews. In the Supplement Charles L. Pollard treats of the families of the Orders Primulales and Ebenales and begins that of the Gentianales.

Bird Lore for May–June opens with an article on 'The Increase of the Chestnut-sided Warbler' by A. Radclyffe Dugmore, illustrated with reproductions of some good photographs by the author. Francis H. Herrick writes of 'The Chebec's First Brood,' and Gerard A. Abbott describes 'A Grebe Colony.' The fourth paper of the series 'How to Name the Birds,' by Frank M. Chapman treats of the Tanagers, Swallows, Waxwings and Shrikes. The shorter articles, including notes, reviews and editorial comment, are all interesting.

The Museums Journal of Great Britain for May contains a description of the new Glasgow Art Gallery and Museum, which was an outcome of the successful international exhibition of 1888. The cost will be not far from $1,250,000. There is a series of notes on 'Some South African Museums' which shows that steady progress is being made in natural science, and the balance of the number is taken up with notes on British and foreign museums.

SOCIETIES AND ACADEMIES.

PHILOSOPHICAL SOCIETY OF WASHINGTON.

THE 553d regular meeting was held May 10, 1902, Vice-President Gore in the chair.

The first paper was by Dr. S. P. Langley, 'On the Laws of Nature,' is printed in the current issue of SCIENCE.

Mr. C. G. Abbot, of the Smithsonian Astrophysical Observatory, then read a paper on 'The Relation of the Sunspot Cycle to Meteorology.'* The author admitted as proved

* This paper will appear in the *Monthly Weather Review* for April.