trated by forty-one full-page views and plans, and one hundred and forty-two figures in the text; it is written in a simple style and printed in large type; and within a moderate compass the volume furnishes a large amount of information, combined with the results of experience, especially in the United States, which should prove of considerable value to engineers engaged in irrigating arid regions.

OUR BOOK SHELF.

Graphic Statics, with Applications to Trusses, Beams, and Arches. By Jerome Sondericker, B.S., C.E. Pp. viii+137. (New York: John Wiley and Sons; London: Chapman and Hall, Ltd., 1903.) Price 8*s.* 6*d.* net.

THIS is a very practical treatise on the determination of the forces in braced structures, beams, masonry arches, and abutments. It is based on a course of instruction given at the Massachusetts Institute of Technology. The author presupposes a knowledge of the strengths of materials, of the principles of statics, and of ordinary beam formula for stresses and deflections, and is thus able to present his methods in a very concise form without any lengthy preliminary explanation, and he pays special attention to the precautions which should be taken in drawing the diagrams in order to secure the best results.

The graphical processes are accompanied by analytical calculations, and the student is wisely encouraged to make himself familiar with both methods of computation, and not to follow either slavishly. Building construction is mainly drawn upon in providing examples, which include such cases as steel framed buildings under the action of gravitation loads and wind pressures. The author does not employ the strain energy method or its equivalent for structures with redundant elements, but proceeds by arbitrary assumption as to what seems probable in each particular case. This is often the only feasible plan, but too much reliance should not be placed on the results obtained. For instance, there is probably considerable error on p. 79 in the tacit assumption that the reactions in the trussed beam are the same as if the middle support did not yield. Considerable attention is given to frames where the members are subject to binding stresses as well as to direct stresses.

The three-hinged arch is dealt with, and some of the methods which have been proposed for determining the line of resistance in a masonry arch are briefly discussed; the author works out one example in full detail, showing how to find the linear arch which lies within a specified region (such as the middle third), and has the least horizontal thrust.

Memories of the Months. Third series. By Sir Herbert Maxwell, Bart. Pp. xi+290; illustrated. (London: Edward Arnold, 1903.) Price 7*s.* 6*d.*

THE author has no occasion to offer apologies for converting the "Memories" into a trilogy, and it is with sincere pleasure that we welcome this latest addition to a charming series, of which we hope we have not yet seen the end. Whether his subject be forestry, the habits and activity of squirrels, local place-names, salmon-disease, or "vole-plagues," Sir Herbert writes with a charm peculiarly his own, and, while imparting information, does so in a style which many of our best novelists might envy. Perhaps the highest praise we can bestow is to say that whenever one of the author's books comes into our hands for review, we invariably read it from beginning to end—and that with pleasure and satisfaction.

As Sir Herbert is not, we believe, a professed naturalist, a few slight errors, mainly due to lack of acquaintance with current zoological literature, could scarcely fail to occur in a work of this nature.

For instance, his arguments and conclusions drawn from the remarkable distribution of the fresh-water fishes of the genus Galaxias (p. 50) are rendered practically nugatory by the recent discovery of a marine representative of that group. Again, he does not appear to be aware that the Thessalian vole (p. 39) has been assigned to a new species by Captain Barrett-Hamilton, under the name of *Microtus hartingi*. We may also direct attention to the practical repetition, on pp. 46 and 47, of the account of the damage inflicted on Scottish pine forests by crossbills given on pp. 1 and 2, the repetition extending even to the fading of the crimson of the head and neck of the bird to dull greenish-olive after death. Another repetition will be found by comparing pp. 73 and 115, in connection with the origin of the name Winchester; with the discrepancy that "Gwent" is stated to mean "white" in the latter, and "downs" in the former passage. Finally, the misprint *Odicnemus* on p. 102 is scarcely consonant with the author's predilection for etymology.

Where all is interesting, it is difficult to select passages for special notice. Attention may, however, be directed to the calculation of the muscular activity of the goldcrest as contrasted with that of man (p. 40). It may also be noted that the author defends his contention as to the limited height to which holly is prickly by the remark that when this has been called in question it is owing to artificial strains, and not the natural wild stock, having been the subject of observations.

With this we must take leave of a volume as charming and full of interest as its predecessors. R. L.

Educational Woodwork. By A. C. Horth. Pp. 159. (London: Percival Marshall and Co., n.d.) Price 3*s.* 6*d.* net.

THE author has attempted to provide, within the restricted limits of a hundred and sixty pages, a three years' course of woodwork, drawing, and object lessons; chapters on discipline, organisation and method; particulars as to the fittings and furniture required for the exercises, as well as hints on the instruction of deaf, blind, and special children. At the same time he has found space for nearly two hundred illustrations. The consequence is that the instructions are meagre, and in many cases quite inadequate. The illustrations in the earlier pages are good, but some of the drawings intended to help the object lessons outlined in chapter viii. will fail to convey much meaning to pupils. The courses of woodwork are also published separately in pamphlet form at fourpence net for each year.

Die Proportion des goldnen Schnitts. By J. Kübler. Pp. 36. (Leipzig: B. G. Teubner, 1903.)

THIS is an attempt to discuss the properties of quantities in continued proportion, and in particular the series of proportionals derived from the problem of medial section, in connection with a large number of mathematical, physical, and even physiological problems.

If books of this kind are written and read as a recreation by people who enjoy thinking about semi-mathematical and semi-philosophical considerations, and who merely take the conclusions arrived at for what they are worth, without attaching special scientific value to them, then the present volume completely fulfils its object.