

showing the variation in composition, even in samples from the same locality. The only stone which has as yet been found to fill all the requirements of the lithographer's art is that from Solenhofen, in Bavaria. In the United States materials of the nature of lithographic stone have been reported from a number of localities described by the author. While, however, it was possible to get small pieces suitable for trial purposes, every locality has failed, as a constant source of supply of the commercial article. Very encouraging reports come from Canadian sources, and it is possible that a considerable lithographic stone industry may yet be developed in the Dominion.

*Essais des Metaux, Theorie et Pratique.* By L. Gages, Chef d'escadron d'Artillerie. Pp. 168. (Paris: Gauthier-Villars, no date.) Price 3 francs.

THIS little work, the sixth of the "Aide-Memoire" series on metals, by the same author, is written with much of the charming clearness of diction generally found in French metallurgical writings. There are two parts, the first on the theory of the tests and the second on practice. Considering the size of the page (convenient for the pocket), the matter is wonderfully well treated. Thus, to take the tensile test as an example, there is a general heading, Preliminary Ideas, with paragraphs (1) Period called Elastic, (2) Period of Deformation, (3) Contraction, (4) Curve of Traction. In this last is worked out from the ordinary tensile curve, showing elongation and tons per square inch on the original section, a curve showing tons per square inch on the real section, thus making plain to the student the reason for the apparently paradoxical form of the ordinary curve. The next main heading is the Law of Similitude, treated under six subheadings, the first of which, for example, considers the two permanent elongations produced during tensile testing. These two very distinct elongations are not only made clear, but methods are given for their determination, and the steps in the reasoning are worked out by simple mathematical methods where necessary. In like manner are handled such subjects as elasticity, influence of temperature, repetition of stresses, distribution of deformations, augmentation of elastic limit.

Part ii., on practice, treats in a general way of the tests applied by engineers before accepting cast-iron, steel, steel castings, &c. A short chapter gives a general idea of the kind of tests applied to metals other than the iron family. Two pages on microscopic metallography are full of wisdom, counselling caution in its use alike for specification and deduction, which might well be taken to heart by some present day advanced workers. If one remembers that the little book is of a very general nature and deals with ideas about tests and testing with few details, then it is heartily to be recommended.

A. McW.

*Karl Heumann's Anleitung zum Experimentiren bei Vorlesungen über anorganischen Chemie.* By Dr. O. Kühling. Third edition. (Brunswick: Vieweg und Sohn, 1904.) Price 19 marks.

So long as the lecture system of imparting information is retained, so long will the experimental demonstration remain its necessary accompaniment. It is useless to contend that a student cannot derive the advantage by seeing an experiment performed that he would were he to do it himself in the laboratory. Apart from the costliness of much of the apparatus, the difficulties of manipulation would put it beyond the power of a beginner to obtain satisfactory results, which depend, as they frequently do, on the skill and experience of the experimenter. Provided an experiment is neither merely pretty nor obviously sensational, nor lasts long enough to interrupt the train of ideas, the effect can

only be stimulating to the student. But the effective lecture experiment fulfilling these conditions requires a good deal of thinking and working out, and that is why the books on lecture experiments by Heumann and Newth are invaluable to teachers whose time outside the lecture room is occupied with research or the manifold duties of their departments. The third edition of Heumann's "Anleitung zum Experimentiren" will be welcomed by all teachers of chemistry. The author, who is perhaps better known as the discoverer of the indigo synthesis, died in 1894, shortly after the second edition of his work appeared, and the task of revision has fallen to Dr. Kühling. The experiments which he has added relate to electro-chemistry, to the use of liquid air in low temperature experiments, and to Moissan's electric furnace and Goldschmidt's reduction methods for the production of high temperature reactions. Physical chemistry also claims a small share of the new edition. The increasing use of the lantern has induced the editor to introduce a chapter on optical projection which includes an account of an electric installation for the lecture room. The author has had the advantage of obtaining much valuable information from such skilled experimenters as Landolt, Fischer, Buchner, Bunte and many others, with the result that the volume has swelled to a bulk which might dismay any ordinary lecture assistant.

J. B. C.

*Church Stretton.* Vol. ii. *Birds*, by G. H. Paddock; *Flowering Plants*, by R. de G. Benson; *Mosses*, by W. P. Hamilton; *Parochial History*, by H. M. Auden. Pp. 205+ xvii. Vol. iii. *Pre-Roman, Roman, and Saxon Archaeological Remains*, by E. S. Cobbold; *Church Architecture*, compiled by E. S. Cobbold. Pp. 124+x. Both volumes edited by C. W. Campbell-Hyslop and E. S. Cobbold. (Shrewsbury: L. Wilding, 1904.) Price 5s. net each.

THE first volume of this instructive guide to Church Stretton, which is now complete, was reviewed in our issue for October 11, 1900 (vol. lxii. p. 571), and, as pointed out on that occasion, the first instalment dealt with the geology, macro-lepidoptera, and the molluscs of the neighbourhood. As might be gathered from the titles of the sections into which the present two volumes are divided, the completed account of Church Stretton contains all that a visitor or resident is likely to want to know. Moreover, as the volumes contain the results of local scientific research and observation by competent workers, they may be used with confidence as a guide to the natural history and archæology of the district.

In the introduction to the catalogue of the birds met with in the district of Church Stretton, Mr. Paddock directs attention to the fact that owing to the persistent persecution by game preservers, some of the larger Raptores, which formerly bred there, do so no longer, and that the smaller species are, from the same cause, rapidly diminishing in number. A similar fate has befallen some members of the Corvidæ, though to a lesser degree.

Mr. Benson's catalogue of the phanerogams of Church Stretton is conveniently arranged and exhaustive in its character. Owing to the ill-health of the compiler, this list was revised by Mr. Hamilton, who deals also with the mosses of the neighbourhood.

*Fundamentals of Child Study.* By Edwin A. Kirkpatrick, B.S., M.Ph. 2p. xxi+384. (New York: The Macmillan Company; London: Macmillan and Co., Ltd.) Price 5s. net.

"This book," we are told, "is an attempt to present, in an organised form, an outline of the new science of child-study for investigators, students, teachers, and