

The sense of taste is shown to include at least four distinct senses—sour, saline, bitter, and sweet. Some interesting experiments are given on p. 161, which show that the catfish, *Amiurus*, responds to meat juice by means of taste-buds situated on the sides of the animal. What is also significant is that the response is accompanied by "local sign," just as touch is in ourselves. The fish is aware of the position of the stimulus, turns to it, and swallows the meat. The response is absent when the nerves to the taste-buds are cut.

Prof. Parker holds that the sensations produced by various chemical irritants are to be distinguished from those of pain, although both are devoid of differentiated receptor organs and are mediated by free nerve endings. The chemical sense is said to be abolished by a smaller dose of cocaine than is the sense of pain. They have in common, however, a high threshold value, as would be expected from the nature of the structures stimulated. As the object of the sensibility is mainly to avoid injury, too great a delicacy would clearly be a disadvantage. The last chapter of the volume contains an interesting discussion on the relations between the common chemical sense and those of smell and taste. Of the three the olfactory sense is regarded as the most primitive, that of taste the most highly developed, with the common chemical sense as intermediate in evolution.

The volume is a very useful summary of our knowledge on the subject of the "chemical" senses as a whole.

W. M. B.

Our Bookshelf.

Geologie in Tabellen für Studierende der Geologie, Mineralogie, und des Bergfachs, der Geographie und der Landwirtschaft. Von Prof. Dr. K. Andréé. Erster Teil. Pp. xv+96. Zweiter Teil. Pp. 97-134. Dritter Teil. Pp. 135-228. (Berlin: Gebrüder Borntraeger, 1921-1922.) Three parts, 8s.

THE most remarkable things about this representation in tables of matters with which the geologist has to deal are the ingenious industry of the author and the very moderate price at which the book has been so excellently produced. Whether it will appeal to students depends much on the individual frame of mind. We incline to think that the "Tabellen"—we had almost written "tabloids"—will be of most, and indeed of considerable, service in the private library, as reminding the worker of what to look for in larger and descriptive treatises. It is to be regretted that there is no index to the mass of information of an expected or unexpected nature here assembled.

The author, in view of the abundance of material, has wisely kept the classification of igneous rocks on very simple lines. The customary grading of the "fine earth" of soils is given in section B of Table 49. Prof. Andréé has directed attention to his use of gnaptolites

and ammonites in the stratigraphical tables, and here the succession of strata in various regions is set forth under the several systems. The columns dealing with the later series naturally show far more detail than those relating to the Carboniferous and older systems. The full treatment of Cainozoic strata should go far to correct the notion of their relative unimportance that still prevails among geologists in the British Isles. This is, we fancy, the portion of Prof. Andréé's work that will be referred to most often.

Prof. Andréé in his last ten pages generously provides a list of authoritative modern works on geology, which will guide the student into more arcadian fields. With two exceptions in favour of the United States, and three of an international character, the books named are all in German, so that we miss Geikie's "Text Book," Haug's "Traité," and De Margerie's translation, virtually a revised and extra-illustrated edition, of Suess's "Antlitz der Erde." G. A. J. C.

Reinforced Concrete: A Practical Handbook for Use in Design and Construction. By R. J. Harrington Hudson. Pp. xxiv+318. (London: Chapman and Hall, Ltd., 1922.) 16s. net.

THIS volume is one of the very few treatises on reinforced concrete in which the properties of the materials employed, and the methods of working these materials so as to produce the finished results, receive adequate treatment. The matter is of great importance from the student's point of view; in too many instances, after a course in reinforced concrete, the impressions left in his mind are somewhat hazy, and he is apt to think that the subject is one consisting only of complex calculations. The early chapters in the book before us will go far to remove this impression. Most of the space is taken up with questions of design, both in theory and practice; the plan generally followed has been to give a general discussion of the particular problem, and then to throw the results into the form of tables and graphs so as to simplify so far as possible the practical work of the designer. The reader will find the numerous worked-out examples very helpful in gaining a knowledge of the methods of practical design. The portions dealing with monolithic design are good, and include discussions on secondary stresses and on continuous beams monolithic with columns. In developing this part of the subject the author successfully employs the equation of three moments. The London County Council reinforced concrete regulations are included in the volume, as also are extracts from the British standard specifications relating to Portland cement, and structural steel. The author is to be congratulated on his volume, which cannot fail to be of value both to engineering students and to those engaged on the practical side of structural engineering.

The Topography of Stane Street: a Critical Review of "The Stane Street," by Hilaire Belloc. By Capt. W. A. Grant. Pp. 95. (London: John Long, Ltd., 1922.) 5s. net.

IN his critical review of Mr. Belloc's "Stane Street," Capt. Grant has produced a valuable study of this Roman way, which, although the author pretends to offer no opinion on historical or archæological points and confines himself to questions of topography, is of