

with these regulations Dr. Smalian has enlisted the services of a teacher in one of these schools at Halle. The first half of the part before us is devoted to the elements of botany, and the second to the rudiments of zoology, as exemplified by mammals and birds, the plan being to describe one particular species of plant and animal in considerable detail, and then to discuss some of its relatives. The illustrations, coloured and otherwise, are, if we mistake not, the same as those used in the "Leitfaden," although in certain instances reduced in size. This part is intended for the instruction of the seventh class (Lehrstoff der vii Klasse), so that in this case also the various sections of the work are to be read in consecutive order by the different classes. Both textbooks appear well suited for their respective purposes.

*Die Photographie.* By W. Zimmermann. Pp. iv+164. (Leipzig: Quelle und Meyer, n.d.) Price 1.80 marks.

IN twenty-three short chapters and an introduction the author has provided a general guide for beginners in photography similar to the numerous small guides that we have in English, but differing from them in being more fundamental and less detailed in the matter of manipulation and precautions. The difference may be due to the more general diffusion of elementary scientific knowledge in Germany than in this country. Formulæ for the preparation of various printing papers and plates are given, as well as instructions for their use, so that the volume is in no sense a mere collection of instructions for the manipulation of commercial products. This being as it is and the volume so small, it is interesting to note the selection that the author makes from the innumerable alternatives now available. The formulæ for developers are in the following order:—Ferrous oxalate, pyro-soda, pyrocatechin, pyrocatechin without sulphite, hydroquinone, and metol-hydroquinone.

In a chapter on "the chemical action of light and development" the ionic theory is employed, a commendable procedure if those for whom the book is written may be presumed to understand it. But the author evidently has his doubts, for he sets forth in detail the chief fundamental facts upon which the theory rests. In this case it appears to us that so far as the very little chemistry introduced is concerned, the explanations would have been more simple and still sufficient if the facts had been dealt with on the older plan, without reference to electric charges and their migrations. We notice a few old-fashioned errors with regard to actual products of certain chemical changes, but on the whole the text is trustworthy, interesting, clear, and very concise, and the illustrations are apt.

*Science in Modern Life.* Edited by Prof. J. R. Ainsworth Davis. Vol. iii. Pp. ix+187. (London: The Gresham Publishing Co., 1909.) Price 6s. net.

THE two earlier volumes of this work—which is to be completed in six volumes—were noticed in NATURE of March 4 (vol. lxxx., p. 1). The intention of the work is to give a broad outline of the principles of science and their relations to human progress and industry. The various departments of natural knowledge are surveyed by eleven different authors, each of whom is well qualified to deal with his particular subject. The present volume is devoted chiefly to light, sound, magnetism, electricity, and other branches of physics not dealt with in the second volume; and, in addition, about seventy pages are given to general biology and botany.

Mr. J. H. Shaxby's treatment of physics seems to us to be appropriate to the design of the work and calculated to create and foster interest in the subject.

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Attention is given to the studies of recent years, such as radiation pressure, radio-activity, Hertzian waves, and wireless telephony, and the style of description is both readable and attractive. Dr. H. J. Fleure deals with the difficult subject of the cell and nuclear division, and gives a general survey of simple forms of life. Neither this section, however, nor that by Mr. J. M. F. Drummond on botany which follows it, will be intelligible without preliminary knowledge of the subject, and will not appeal, therefore, to general readers.

A work on various subjects, written by several authors, is rarely uniform in character and scope, and the present series of volumes is no exception to the rule. In spite of this fact, we are glad to express the hope that the work will be the means of bringing problems and advances of modern science under the notice of a wide circle of readers.

*The Central Nervous System of Vertebrates.* By J. B. Johnston. Pp. 170. (Jena: G. Fischer, 1909.)

THIS interesting monograph appears in Dr. J. W. Spengel's "Ergebnisse und Fortschritte der Zoologie." It gives an excellent account of the structure and mechanism of the central nervous system founded on morphological and physiological facts, as these have been laboriously collected by the most modern methods by which the nervous elements have been examined. The author deals with the plan of reflex mechanisms, he describes the architecture and localisation of the central ganglia and nerve-roots, and his illustrations are drawn from morphological studies of the simpler types. One of the most important sections is No. vii., in which he discusses the functions of the great divisions of the nervous system. Nowhere have we seen a better discussion of the relations and functions of the cerebellum, or a more lucid account of the remarkable deep connections of the auditory nerves. The author has evidently received illumination from the researches and constructive criticism of Sherrington, while, as indicated by a good bibliography, he is acquainted with the literature of this vast subject. The work is a valuable contribution to human and comparative neurology.

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*Vorlesungen über technische Mechanik.* By Dr. August Föppl. Vierter Band, Dynamik. Dritte, stark veränderte Auflage. Pp. viii+422. (Leipzig: B. G. Teubner, 1909.) Price 10 marks.

IN this volume the vector equation of mass acceleration commonly known as Newton's laws is applied to the "law of areas," the problems of harmonic and oscillatory motion, the brachistochrone, motion of a rigid body, motion under no forces and motion of a top, vibrations of elastic bodies and equations of motion of hydrodynamics. The use of vector equations throughout and differences of notation and terminology make the treatment a little difficult for an English reader to follow; but it is clear that the author has fully realised the subject of his book to be *dynamics*, not the integration of differential equations. If exceptions exist, the most noticeable one is in the sections dealing with cycloidal motion, the whole problem of which can be solved, almost without writing down a single equation, by showing the geometric properties of the cycloid in a diagram where the author employs many formulæ. Among practical illustrations we notice the reference to Schlick's balancing of marine engines, while the reference to the Kegelbahn or skittle-ground takes our thoughts back to the Fatherland, with its pleasant afternoons spent in admiring the view, drinking beer, and listening to the heavy roll of the balls.