

practical disinfection, based mainly on the report of the Committee on Disinfectants of the American Public Health Association.

The third part, the most important division of the book, deals with pathogenic bacteria in detail, and is prefaced by a description of their modes of action, and of the ways in which they may gain access to the system. Here too we find a discussion on the difficult subjects of susceptibility and immunity, to which indeed Dr. Sternberg has elsewhere made important contributions. The discussion is lengthy and impartial, and well deserves careful reading. Relying on recent experimental evidence, the author reaches a guarded conclusion that acquired immunity depends on the formation of antitoxins in the bodies of immune animals. Subsidiary weight is given to the view, which he formerly upheld, that the cells of the body may acquire tolerance to the toxic products of pathogenic organisms, and also to the doctrine of phagocytosis, to which he gives a partial assent. A recent lecture by Metschnikoff on the latter subject is reproduced *in extenso*. It is impossible here to follow in detail the descriptions of the different pathogenic bacteria. The order in which they are discussed is necessarily somewhat arbitrary, but is convenient, and follows the broad grouping into micrococci, bacilli and spirilla. Amongst the pyogenic organisms Fehleisen's *Streptococcus erysipelatos* is frankly placed as identical with *Streptococcus pyogenes*, an arrangement with which many will not agree. Altogether no less than 158 organisms are described as pathogenic for man or the lower animals, and according to their relative importance the descriptions are in large or small print—an arrangement convenient for the student. A section follows on bacteria in diseases not clearly proved to be of bacterial origin, and the whole concludes with a classification of pathogenic organisms from a pathological standpoint.

The fourth part of the book deals with saprophytic bacteria, special chapters being devoted to bacteria in air, in water, in soil, in or on the human body, and in food. The total number of saprophytes described is 331. The merit of a work of this kind depends less on the number of species described than on the clearness and accuracy of the descriptions, and Dr. Sternberg has spared no pains to make these as complete as possible. To facilitate the recognition of species a chapter on bacteriological diagnosis has been added, in which the different organisms are grouped according to their form, cultural characters, and other peculiarities. This section will be an important aid to the student in identification. A lengthy and well-classified bibliography brings the work to a conclusion, and the whole is well indexed. The author is to be congratulated on the success with which he has accomplished a difficult and laborious task.

#### TEXT-BOOKS OF ZOOLOGY.

*Lehrbuch der Zoologie.* By Prof. Richard Hertwig, of Munich. (Jena: Gustav Fischer, 1891.)

*Zoology of the Invertebrata.* By Arthur O. Shipley, Fellow of Christ's College, Cambridge. (London: A. and C. Black, 1893.)

IT is a difficult matter to say much that is readable about text-books which are produced by teachers with a view to the limited requirements of their own

pupils. Some text-books are, so to speak, obviously addressed to the world—are intended by their authors to be consulted both by the advanced student who is himself a teacher, and by all serious followers of the science dealt with. Others have their justification in being epitomes of a professor's or lecturer's teaching, suitable to his immediate pupils. The former class challenge criticism, and have a high standard of interest; the latter class are hardly fit subjects for appreciation, and possess a very limited importance.

Prof. Hertwig's text-book of Zoology is one which will no doubt be found serviceable by his pupils, and by the younger students of German universities. It is constructed on the usual lines, and contains nothing either in treatment or illustration which the author would probably wish to submit to his colleagues as novel or important. It has not the stamp of originality and freshness which gives a character and significance to Prof. Berthold Hatschek's unfinished text-book. It is well illustrated by the aid of the new "process" methods, and must be estimated as much by the judgment displayed in the omissions necessary in so condensed a work as by the actual statements which it embodies. The latter are, though not novel, sufficiently up to date.

Mr. Shipley's book on the Invertebrata appeals to an even more limited circle than Prof. Hertwig's. Professedly it is addressed to those who only wish to learn a very little about zoology, and who will be content to dispense with all bibliography, and even with reference to the names of authorities for the statements and for the systems of classification which Mr. Shipley incorporates as accepted fact. Presumably Mr. Shipley's book is intended for Cambridge students who take zoology in Part I. of the Tripos, and do not proceed to Part II. The book will no doubt prove useful to these students. To others, a more critical, more comprehensive, and more authoritative treatment of the subject must be recommended. To those who are not acquainted with special circumstances which may have determined the author's procedure, it must appear a matter for regret that when producing a volume so well printed and largely illustrated he did not make it more thorough. It is not possible to discuss the opinions adopted by Mr. Shipley upon several questions of interest, because he himself does not treat them argumentatively, but rather as matters of information to be accepted by the pupil from his tutor. Zoology, when deprived both of history and of argument, is singularly uninteresting, and will perhaps in this shape gain approval as a subject of school-education.

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#### OUR BOOK SHELF.

*Das Genetische System der chemischen Elemente.* Von W. Preyer. (Berlin: R. Friedländer und Sohn, 1893.)

THE treatment of the material contained in this book is based on the idea that the elements have been produced from hydrogen, or ether, or primordial matter, by a process of condensation.

The fourteen horizontal rows of the periodic table are regarded as representing fourteen different degrees of condensation of the initial substance, and the rows are then connected together so that they fall into five different groups, each of which group constitutes a generation.