

prevention and remedial measures against them, than any other entomologist; and whose store of information many writers upon economic entomology have calmly used without acknowledgment. His "Praktische Insekten-Kunde" is a model of what a work upon baneful insects should be.

The 149 illustrations in "Agricultural Zoology" are good, especially those from Taschenberg, which are very clear, and some of these form very pretty pictures. It would be a great assistance to readers if an index had been supplied, for it is difficult to find references that are required.

Upon the whole we cannot congratulate Prof. Ritzema Bos upon his last production. If he had reproduced parts of his larger work, "Tierische Schädlinge und Nützlinge," without alteration, it would have been far better than boiling it down and entitling the result "Agricultural Zoology."

OUR BOOK SHELF.

Progress in Flying Machines. By O. Chanute, C.E. (London: Messrs. Sampson Low, Marston, and Co., 1894.)

THIS book is a reissue of a series of twenty-seven articles which appeared in *The Railroad and Engineering Journal* (now re-designated as *The American Engineer*) of New York City. It gives a very complete account of the many experiments that have been performed by various experimenters with details of the machines used, and clear reasons why so many of them have failed. After a short statement of general principles the author describes the machines in which wings and parachutes were used; then those in which screws were used to lift and to propel. The author believes that the true function of aerial screws is to propel and not to lift (page 72); but Lord Kelvin, in the discussion on aerial navigation at the British Association in Oxford, last August, stated his belief in screws working round a vertical axis for the latter purpose. The greater part of the book is devoted to a description and discussion of aeroplanes. The whole subject of aerial navigation resolves itself into ten problems or conditions:

- (1) The resistance and supporting power of the air.
- (2) The motor, its character and its activity.
- (3) Selection of the instrument to obtain propulsion.
- (4) The form and kind of the apparatus for sustaining the weight—whether flapping wings, screws, or aeroplanes.
- (5) The amount of the sustaining surface required.
- (6) The best materials to be employed for the framing and for the moving parts.
- (7) The maintenance of the equilibrium, which is the most important, and perhaps the most difficult of solution, of all the problems.
- (8) The guidance in any desired direction.
- (9) The starting up into the air under all conditions.
- (10) The alighting safely anywhere. Safety in starting up, in sailing, and in coming down is essential.

All these problems are fully and fairly discussed in this volume. There are eighty-two diagrams, and an excellent index, which add greatly to the value of the book.

Fertilisers and Feeding Stuffs; their Properties and Uses. By Bernard Dyer, D.Sc. (Lond.) (London: C. Lockwood and Co., 1894.)

THIS little book, which is a handbook for practical farmers, and is not addressed to the agricultural student, is issued opportunely. It contains the full text of the Fertilisers and Feeding Stuffs Act 1893, and the

Regulations and Forms of the Board of Agriculture relating to the same, and also some useful notes on the Act, by Mr. A. J. David, Barrister-at-Law. Dr. Dyer's notes were first published in the form of newspaper articles, and have been reprinted by request; they will prove very useful to the class to whom they are addressed, containing as they do short descriptions of the origin, composition, and uses of farmyard manure, artificial manures, and of purchased feeding stuffs, all of a practical nature. The notes on the new "Fertilisers and Feeding Stuffs Act" will also be useful to those who wish to put this Act into use; but these, we anticipate, will be few.

Heat treated Experimentally. By Linnaeus Cumming, M.A. (London: Longmans, Green, and Co., 1894.)

THE companion volume to this—"Electricity treated Experimentally"—is known to most teachers of physics. The present work aims at giving (1) an elementary account, with easy experiments, of the general laws of heat; (2) a brief account of the classic researches of Regnault, Joule, and other eminent investigators; (3) a description of the theory of heat comprehensible to students whose mathematical range does not extend beyond elementary trigonometry. This laudable design is satisfactorily realised. Mr. Cumming writes clearly; in other words, he knows what to say and how to say it. The experiments described are all workable and well arranged, hence the book is one which may be used in science classes with confidence and pleasure.

Ways and Works in India. By G. W. MacGeorge, M.I.C.E. (Westminster: Constable and Co., 1894.)

AN account of the public works in India from the earliest times up to the present day should be useful, if only as an outline for a precise and detailed history of Indian Public Works. The materials for the compilation before us have been collected by the author from various official publications, and the facts are arranged in a satisfactory manner. The subjects treated are the trigonometrical survey of India; roads; irrigation works; railways; water-supply of towns; internal telegraphic system; and sea and harbour works. The data referring to these matters will be valuable to all interested in the progress of India. The work does not appeal to a large public in England; nevertheless, it presents, in a readable form, much useful information on the engineering works which will stand for many years as monuments to British rule in India.

Manual Pratique de L'Aéronaute. By W. de Fonvielle. (Paris: Bernard Tignol.)

IN this book of 246 pages, M. de Fonvielle, a well-known writer on aeronautical matters, contrives to compress a mass of information of use to the aeronaut. We recommend the book to practical aeronauts, meteorologists, and the numerous amateurs who are interested in ballooning and its possibilities. Seventy figures illustrate the text. It has been said that the development of the art of flying has been retarded by the balloon; but even if this is conceded, M. de Fonvielle's book shows that science has gained a little from ballooning.

Fruit Culture for Profit. By C. B. Whitehead, B.A. Pp. 68. (London: Society for Promoting Christian Knowledge, 1894.)

IN view of the recent correspondence in the *Times*, on fruit culture, this book appears very opportunely. Fruit-growing is now recognised as a valuable branch of agriculture, and English producers are becoming alive to its importance. The Royal Agricultural Society and the Board of Agriculture have encouraged fruit-growing by publishing articles and pamphlets upon the subject. These publications, and Mr. Whitehead's little volume, should be obtained by all who are interested in the profitable production of fruit.