

highest or the lowest class. The naturalist may search them through without finding any passage which throws new light upon an important question. Perhaps we may, rather doubtfully, put "A Year in the Fields" among the books that both amuse and instruct. Mr. Burroughs is most agreeable to read, and now and then he tells us something that we are glad to know. But he sacrifices a little too much to the necessity of pleasing, and his books are impressions rather than studies. Miss Merriam and Mr. Crawford definitely belong to the class which amuses and does not instruct.

Mr. Burroughs has now found his public, and needs no lengthy notice at our hands. He writes as one who lives in daily contact with nature, occupying himself with her superficial aspects rather than with her problems. The reader of his books finds many pleasant pages, like the best descriptive passages of good novels, and occasionally a hint of some curious knowledge or reflection. Such a book as that before us (which, it is necessary to note, contains no new essays) is welcome to the naturalist in his less serious moods; it is genuine literature with a strong flavour of the woods and fields. The volume is illustrated by twenty photographs, of which all but one contain the author's figure in some favourite haunt. It is cheerful to think that he has now escaped from the public office, and is entering old age as a fruit-farmer on the Hudson.

Miss Merriam tells in a sprightly way her observations upon live birds in California. The Bronco is an old horse, from whose back she studied the birds with an opera-glass. The book is crowded with details, but they are hardly ever worth remembering; it relies upon its literary qualities, which are good, but not excellent. There are many illustrations, chiefly of nests or birds' heads.

Mr. Crawford's book is even thinner in substance than Miss Merriam's. A facile writer could come home after sitting for an hour in a garden-chair, or sauntering along a lane, and write such sketches as these almost without effort. They incline to the sermon in some places, to the novel in others. The very best remark in the book, from the naturalist's point of view, is this (p. 100): "The feet [of the lark] are adapted for running. They cover so many of the grass stems at once, that not only does the bird get along very much as one does on snowshoes, but the elasticity of the pressed-down herbage aids in the spring." The illustrations have no natural history value.

L. C. M.

OUR BOOK SHELF.

Guide pour le Soufflage du Verre. By Prof. H. Ebert. Translated from the second German edition, with notes by Prof. P. Lugol. Pp. 191. (Paris: Gauthier-Villars et Fils, 1897.)

THE utility and importance of even a small amount of knowledge in the art of blowing glass is perhaps best known to those who work in chemical, physical, and astrophysical laboratories. Tubes will crack, pumps will get broken, and many other similar mishaps will occur in the ordinary course of laboratory work. In such cases two remedies are available: either new apparatus must be bought, or it must be made. The former is doubtless the easiest, but the most expensive;

while the latter is, in many cases, a saving of both time and money.

In England, Mr. Shenstone's little book on the methods of glass-blowing is the one which is most generally used. Prof. Ebert practically based his first edition on this admirable little treatise, embodying in it both his own observations and methods and those of others. The second edition, however, was considerably altered; in fact the book was practically reconstructed, as it was his intention to insert results of more recent experience, and give a strictly systematic course on glass-blowing.

The book before us is a French translation of this second edition, and it will be found to give full details to its readers how to make all the more common glass apparatus in use in laboratories, and how to mend those when broken. Prof. Ebert has adopted a logical sequence of the chapters, leading the glass-blower gradually by easy stages to the more difficult operations. The reader is first made to understand the mysteries of the blow-pipe itself. He is next given exercises which involve the training of the hands, first singly and then together. More difficult exercises are then put before him, from the construction of a trap to some complicated forms of vacuum tubes. In each lesson the necessary steps are clearly described, and in many cases illustrations are given showing the appearance of the apparatus at its several stages. This is an important point, for the great difficulty that a beginner meets with at first is not so much the actual making of the apparatus (which is acquired after a little practice), but a lack of knowledge of the various steps that have to be accomplished before the final stage is reached. For example, to make a large bulb in the middle of a tube, the beginner generally tries to blow the bulb directly without adopting the more easy stages of blowing three small bulbs close together, and amalgamating them into one large one.

The appendix contains some additional information which will be found useful to those working with glass, such as engraving on glass, the graduation of tubes, &c. Some further notes have also been added by the translator.

As a treatise on glass-blowing, Prof. Ebert's book can be thoroughly recommended, and those who are unable to master the German edition will find Prof. Lugol's translation an admirable substitute. W. J. S. L.

Projectiles de Campagne de Siège et de Place: Fusées. By E. Vallier. Pp. 178. (Paris: Gauthier-Villars.)

L'Éclairage. Éclairage aux gaz, aux huiles, aux acides, gras, &c. By Prof. Julien Lefèvre. Pp. 180. (Same publishers.)

Les Succédanés du Chiffon en Papeterie. By V. Urbain. Pp. 179. (Same publishers.)

THESE three volumes belong to the very practical series published under the editorship of M. Léauté, as the *Encyclopédie scientifique des Aide-Mémoire*.

M. Vallier confines himself to dealing with the projectiles from large guns. The first part of the book is concerned with field artillery (*projectiles de campagne*); the second with ordinary cast shells, shrapnels, and explosive shells (*projectiles de siège et de place*), and the third with fuses arranged to explode when the projectile collides, or at a given point of the trajectory. The volume is full of instructive information on the manufacture, properties, and mode of employment of different types of projectiles used in ordnance pieces.

In "L'Éclairage," Prof. Lefèvre first describes the principles of various systems of illumination, excluding electric lighting. He deals with the many processes involved in the production of gas from coal, and shows how gas is distributed. The many methods employed to burn gas most effectively are also described. Lighting by special gases, and by acetylene, form the subject of two other chapters. In a similar way lighting with candles,