the student when the subject treated is a branch of pure or applied science. And the author who neglects to avail himself of this simple method of enormously increasing the value of his book does grievous injustice to his subject, his readers and himself. No engineer can be a man of one book. The profession needs a broad and deep foundation. Outline treatises, schedules, abstracts from lecture courses and pocket manuals are valuable in their way, but they should be used only as guides to a systematic course of reading or as memoranda in which are collected the results of previous study.

No one probably knows the truth of these statements better than Prof. Crocker, and without doubt it is his recognition of the impossibility of making a complete presentation of his subject which has inclined him to supplement his text with so many valuable references. It is in this connection that the chief criticism upon this work is to be made. The sub-title, 'A Practical Exposition of the Art for the Use of Engineers, Students and Others interested in the Installation or Operation of Electrical Plants,' might fairly lead one to look for an encyclopedia or library even. The book is rather overloaded by its title.

The author has made excellent choice of his matter. The book is remarkably free from 'padding' and as we should expect in a work by Prof. Crocker, the form in which the topics are presented is direct and clear.

Like Oliver Twist, however, the reader is often inclined to ask for more of the same sort.

The student or engineer will find it helpful, if not complete. And we venture the assertion that the general reader and the "Others interested in the Installation and Operation of Electrical Plants' will find this on the whole the most satisfactory work published.

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*Our Native Birds of Song and Beauty.* By H. Nehrling. 4°. George Brumder, Milwaukee. Part XIV. June, 1896.

Again it is our pleasant duty to announce the appearance of another part of Nehrling's meritorious work on North American Birds.

It opens with an excellent colored plate of the Dickcissel by R. Ridgway. The male is singing in a field of red clover, with the mother on her nest below. Another plate by Goering shows the meadow lark and the bobolink, and also the yellow-headed and red-winged blackbirds. The text treats of these species and also of several of the true orioles—Audubon's, Scott's, the hooded, orchard and Baltimore. The biographies, as in previous parts, take one into the woods and fields and marshes, where the birds live, and introduce him to the surroundings before bringing in the subject of the sketch. The matter on geographic distribution has received a little more attention than usual, and considerable information is given on food habits.

The announcement is made that two more parts will complete the present (2d) volume. This is good news, and we heartily commend the book to those who wish to procure, at a reasonable price, a reliable work, with colored plates, on the haunts and habits of North American birds. C. H. M.

*Die Haustiere und ihre Bezeihungen zur Wirtschaft des Menschen. Eine geographische studie,* von Eduard Hahn. Leipzig, Duncker & Humblot. 1896. 8°, pp. 581.

In this work the author has brought together in convenient form a large mass of facts concerning domesticated animals. He begins with the dog and ends with fish. Besides the ordinary domesticated mammals, he includes the yak, buffalo, deer, camel, lama, rabbit, cavy, and ferret. The number of birds treated is also considerable.

In dealing with the origin of the various breeds, the author usually quotes eminent authorities, rarely advancing views of his own. Footnote references are given in profusion, so that those interested in following up the subject shall not want for material.

The systematic part of the work, in which each animal is discussed at length, is followed by a geographical study, in which the several countries are discussed with respect to their domesticated animals. C. H. M.

*The Gypsy Moth.* A Report of the Work of Destroying the Insect in the Commonwealth

of Massachusetts, together with an account of History and Habits, both in Massachusetts. and Europe. By E. H. FORBUSH, Field Director, and C. H. FERNALD, Entomologist to the State Board of Agriculture. Boston. 1896.

The successive steps in the great experiment in economic entomology which has been carried on by the State of Massachusetts during the last five years are admirably portrayed in this volume. Never in the history of this country has so much money been spent by a State or by the General Government in fighting insects as has been used by Massachusetts against this one species, and it is most fortunate that the work has been in efficient hands and that no political jobbery has been connected with it since its start. Whatever the ultimate result of the experiment may be, it cannot fail to have been most instructive as bearing upon future work. The report is an admirable summary of the entire investigation. Mr. Forbush takes up the first half of the volume, some 250 pages, with a history of the gypsy moth in America, carefully detailing year by year the work of the State Commission down to and including the year 1895, following with a chapter on the increase and distribution of the insect, another on the methods used for destroying it, another on the influence of birds in the destruction of the species, and a final chapter on the progress of extermination. He treats fairly the obstacles to extermination, the principal ones being the enormous reproductive capacity of the moth, its very numerous food plants and the dense population of the infested region, which increases the danger of local distribution and reinfestation by the constant passing and repassing of infested centers by men and animals. In spite of these obstacles, however, Mr. Forbush shows that the insect has been locally exterminated, and argues that with sufficient appropriations it may be generally exterminated. He thinks that the policy of control or extermination of insect pests by government commissions, which has been so successful in certain European countries, might be applied in this case by the government of the United States.

The greatest scientific interest attaches to the second part of the report, which has been prepared by Prof. Fernald. It includes a full bibliography and consideration of the distribution of the species in other countries, the methods used to destroy it abroad, an elaborate account of its life history, based upon the most careful original observations, a list of the plants upon which the insect has been known to feed in Massachusetts, another list upon which it has been known to feed in Europe, and, by comparison with these, a very small list of the plants upon which it will not feed. There is further a section on the anatomy of the adult insect and a full consideration of the natural enemies which affect the species both in Europe and in Massachusetts, and the part concludes with an elaborate account of the experiments which have been made with insecticides.

The portion of the report dealing with the biology of the species contains many sections of much importance. The exact experiments upon the amount of food, on the effects of temperature, on hermaphroditism, on polygamy, on assembling and on parthenogenesis are of particular interest. The experiments with insecticides show many results which are most surprising, and none more so than the feeding of caterpillars, for from five to ten days before causing death, upon leaves treated with strong arsenical solutions. In an interesting by-subject—the dying out of the species in England—Prof. Fernald advances a new theory. It has been stated by no less an authority than J. Jenner Weir that the gypsy moth has been exterminated in England simply by collectors. Prof. Fernald, however, is inclined to think that the darker color of the foliage and other surroundings in England have made the female moths more conspicuous objects to their enemies than they are on the continent of Europe, so that in the struggle for existence the species was exterminated before it had time to take on the darker color which would have protected it. The argument is a somewhat elaborate one, and this is simply the conclusion.

The volume is illustrated with a wealth of text figures and plates, and will forever stand as a monument to the enlightened energy of the State of Massachusetts and the practical and scientific ability of its authors.

L. O. HOWARD.