

hoped that the present work will aid in laying the foundations of a more satisfactory system, and will help to point out the gaps in our knowledge as regards the muscles in many important types of birds. The author does not entirely confine himself to a description of the raven: other types are referred to in special cases when certain muscles are not represented in the latter; and comparisons are given in many cases with other forms—mammals as well as birds.¹

Though acknowledging the importance of the question of nerve-supply in helping to determine the homologies of muscles, the author by no means considers this to be an infallible guide; for the representative of the same muscle in various vertebrates is not always supplied by the same nerve. He also quotes some remarks of his own from a previous paper (referred to in the text as No. 124 in the Bibliography, instead of No. 121), with regard to the value of muscles in classification, which are of importance in helping to relegate the muscular system of birds to its proper subordinate position in taxonomy. While fully recognizing the value of Garrod's work in this field, it must be agreed that his myological formulæ only represent one set of characters, which must be taken in conjunction with all others if they are to be of any value in classification.

The various groups of muscles are treated in order, beginning with the dermal system, and a chapter is devoted to each main set. In each group, directions are given how to proceed with the dissection. The figures, of which there are 76, are on the whole excellent, and with few exceptions are original: they represent the different parts of the skeleton, showing the origins and insertions of the muscles, as well as dissections of the muscles themselves. A copious bibliography and index are given at the end of the book.

It is almost impossible to comment on the details of the work without having first made use of it practically. But we can congratulate Dr. Shufeldt on the production of an original and well-arranged text-book, the result of much patient labour in collecting and dissecting, and careful thought in arrangement. The volume will appeal especially to ornithologists, as well as to students of comparative anatomy.

OUR BOOK SHELF.

Chemical Arithmetic. Part I. By W. Dittmar, LL.D., F.R.SS. Lond. and Edin. (Glasgow: William Hodge and Co., 1890.)

THIS volume is not a mere collection of tables extracted from the numerous books which deal with this subject, but is a good and trustworthy piece of work, with no lack of originality about it, and contains the mathematical auxiliaries and both chemical and physical constants which a chemist needs "in the ordinary routine of his laboratory work." Some of the tables contain the results of the author's work, and others have received slight alterations, been put in more convenient forms, and brought up to date.

Indexed tables of three-, four-, and five place logarithms are given, and following these will be found formula

¹ Frequent references are made to Owen's description of the muscles of Apteryx. Quite recently T. J. Parker has shown that some eleven or twelve muscles are present in the vestigial wing of this form in addition to those described by Owen.

values, F, of a number of substances and radicals and their logarithms, analytical factors and their logarithms, gas volumetric determinations, metric and British systems of units, &c. Near the end there is represented in diagrammatic form a double thermometer scale, with Fahrenheit degrees on one side and Centigrade on the other, ranging from -148° F. to $+392^{\circ}$ F., by which a result in degrees Fahrenheit can be directly stated in terms of the Centigrade, or *vice versa*. Throughout the book the author seems to have taken the utmost pains to eliminate all errors that are likely to be made in a work of this sort, and by this means he has placed before the scientific as well as before the technical chemist a useful and trustworthy reference book.

Dictionary of the Language of the Micmac Indians. By Rev. Silas Tertius Rand, D.D., LL.D. (Halifax, N.S.: Nova Scotia Printing Company, 1888.)

THE Micmac Indians are an aboriginal tribe of the Algonquin family, residing in Nova Scotia, New Brunswick, Prince Edward Island, Cape Breton, and Newfoundland. The late Dr. Rand, the compiler of the present work, laboured among them as a missionary for more than forty years. He was a man of great learning and ability, and soon not only mastered the language of the Micmacs, but devoted himself to the task of reducing it to writing. He also translated into it the New Testament and portions of the Old Testament, and claimed to have collected and arranged in alphabetical order no fewer than 40,000 Micmac words. His dictionary consists of a Micmac-English and an English-Micmac part. Greatly to their credit, the Dominion Government paid for the manuscript of both parts, and now they have issued the English-Micmac section of the work. The other section must necessarily be of more scientific interest, but this volume may be of greater practical value. Even from the scientific standpoint, it cannot fail to be of service to philologists. Most students will probably be surprised to find how highly developed a language the Micmac is. It was strongly admired by Dr. Rand, who went so far as to say that in various important particulars it would not suffer from "a comparison with any of the most learned and polished languages of the world."

Elementary Manual of Magnetism and Electricity. By Andrew Jamieson, M.Inst.C.E. (London: Charles Griffin and Co., 1890.)

THIS work is arranged in the form of a series of lectures, and covers the ground laid down in the syllabus for the elementary stage of the Science and Art Department examinations. The subject is divided into three distinct parts. Part I. treats of magnetism; Part II. of electromagnetism and current electricity, under the general heading voltaic electricity; while Part III. deals with frictional electricity. At the conclusion of each lecture a number of examples is given, and in many cases a test question, with the answer. By no means less important are the appendices to each part, in which students will find all the necessary information for making experimental apparatus and for conducting experiments with them. Throughout the book the author has made many references to the practical applications of these experimental facts, such as telegraphy, telephony, electric lighting, &c., and has given some very good illustrations and diagrams, in which the various points for which they were intended have been brought out effectively.

In the present manual, only an elementary knowledge of arithmetic is required in order to follow the expositions; but in the advanced text-book, which the author informs us is now in preparation, and to which the present volume will form an introduction, an elementary knowledge of mathematics will be assumed.