

does not express the meaning of the original and might mislead a careless reader. On p. 164, the German 'Kreuzweise gestellt' is rendered by 'placed crosswise,' which in English would nearly always be taken to mean 'placed across the long axis of the body,' though it might, in English, mean 'arranged in the form of a cross.' This is the meaning of the German.

On p. 191 the sentence beginning 'The embryo is now surrounded by' would be ambiguous if taken by itself, although it is entirely clear in the original. These instances and other similar ones are scarcely worth calling attention to in a work of such general excellence, and every zoologist has reason to be grateful to the translators for their self-sacrificing task.

The book is something more than a translation since both the authors and the translators have added to it numerous notes, which serve, for the most part, to call attention to the contributions that have appeared since the German editions were printed. These additions will be found particularly valuable to the specialist in directing his attention to the recent literature, but in most cases too brief to be of direct use to the student. The additions are distinguished from the original text by the use of brackets, and following each is an indication of its authorship. The authorship of these additions can be a matter of little interest to the readers of the book, and one could wish that the additions had been expanded and the text rewritten to accommodate them.

The translators have added to the lists of literature appendices, which include the literature which has appeared since the publication of the German edition and constitute a very important addition to the book. In matters of bibliography the papers issuing from the Zoological Laboratory of Harvard University have long been models and these appendices are no exception.

Finally the translators have added excellent indexes, subject and author.

The publishers have done their part of the work satisfactorily, and especially so with reference to the illustrations, most of which it would be difficult to distinguish from the originals.

JACOB REIGHARD.

*Artistic and Scientific Taxidermy and Modelling.*

A manual of instruction in the methods of preserving and reproducing the correct form of all natural objects, including a chapter on the modelling of foliage. By MONTAGU BROWNE. London and New York: Macmillan & Co. 1896. \$6.50.

It is something like twenty years since the appearance of Montagu Browne's *Practical Taxidermy*, a book of some 150 pages, and the present handsome volume of nearly thrice that size may be taken as representing the improvements in the art of taxidermy which the author considers to have taken place during the last twenty-five years. The book opens with a brief review of the origin and progress of taxidermy, next comes a short chapter on tools, and then follows a long and valuable section devoted to formulas for various killing, preservative, modelling and other compounds, most of which have been tested, and many of which have been devised by Mr. Browne. This chapter, which includes notes on the permanency of pigments, will prove most useful to both the amateur and professional preparator, for in it are brought together a host of recipes which, even when printed elsewhere, are scattered far and wide. Here, for example, are to be found many of the methods used in the preparation of the beautiful invertebrates sent out by the Naples Station, and here are formulas for making the gelatin casts which have come so much into vogue of late years. Few, however, will agree with Mr. Browne's wholesale denunciation of arsenic as a preservative, and fewer still will accept in its stead whiting and chloride of lime, much less pepper! Arsenic may be used with too free a hand, and exposure to light and air may go far towards preserving fur and feathers from the attacks of insect pests, but arsenic certainly prevents the ravages of *Dermestes*, and there is nothing like it for preserving intact ligamentary skeletons and the sterna of mammals. Especially is this true where hundreds of small 'rough skeletons' are of necessity kept in the duplicate series to be worked on as occasion demands.

From the chapter on collecting one infers that those useful articles, the auxiliary barrel and cyclone trap, have not found their way across

the Atlantic, but we pass on to the mounting and casting of animals which occupies the body of the book. It may be said here that the personal equation is quite as important a factor in taxidermy as in other matters, and while the author's advice and methods are mainly good there are many points wherein it is impossible to agree with him. Mr. Browne also takes it too much for granted that specimens are to be mounted fresh, whereas the majority of specimens which come under the hand of the taxidermist are dry skins, and only too often very poor dry skins. Hence more detailed instructions for relaxing and cleaning dried skins would have been acceptable. The various groups of vertebrates are treated in order, considerable space naturally being devoted to birds. Here the criticism would be that the advantages of skinning birds through the side are slight, the disadvantages numerous, and we would advise the taxidermist to open and mount his birds by a median cut. Also, we consider that mounting a bird with the entire skeleton inside is a great waste of valuable time; we have seen it tried, and the result did not justify the time and labor expended. In fact, the quality of the finished work depends not so much on the mechanical devices employed as on the artistic eye and skilled hand of the workman. The good taxidermist, any more than the artist, needs not to build upon a skeleton, although a knowledge of anatomy is indispensable to each.

The method of mounting mammals over paper casts is dwelt on with veritable enthusiasm, and although we have never seen it practiced, it would seem to be a most excellent plan for obtaining light and accurate specimens. The paper cast is certainly most admirable for copying cetaceans and large fishes, but the reader will not find it so simple in practice as it seems in theory, particularly if undertaken in a damp climate. Also it needs as much skill in this mode of mounting as in any other to avoid stiffness in posing.

The greater portion of the book, after the chapter on birds, is given over to describing various methods of moulding, casting or modelling fishes, reptiles, batrachians and invertebrates, and to the making of accessories, such as flowers, leaves and rockwork. This, supple-

mented by the recipes noted in the beginning, contains some of the most valuable information in the book, and will well repay study, since it treats of extremely useful technical processes which usually have to be learned from some expert. It is a pity, however, that in treating of flowers the reader is not told where he can obtain the oft-mentioned 'Mintorn fabric,' or, failing in this, advised to procure waxed cloth from some dealer in artificial plants, or in the materials for making them.

Finally, there is a very full bibliography of taxidermy, and last, but not least, an index.

From what has been said it will be rightly inferred that the value of this book lies not so much in the portion devoted to taxidermy proper as in that treating of other and related subjects; it can not supersede such a work as Hornaday's *Taxidermy*, but it is nevertheless indispensable to the preparator for its merits in other lines.

It may not be out of place to say that, to a great extent, the pages of this book reflect the changes that have taken place in museums during the past few years. The time was when the museum of natural history was almost wholly for the scholar, the cultivation of the public being quite a secondary consideration. Birds and mammals were represented by more or less poorly stuffed specimens, and anything of a pictorial nature, or even the replacement of colors or of soft parts, was religiously tabooed. Now it is recognized that at least one of the objects of a public museum is to give the public glimpses of living creatures as they really appear, and it is admitted that it is better to replace such appendages as combs and wattles, or even to obscure the scales of a bird's foot with paint, than to show the public dried, distorted and dingy effigies. The visitor does not care to count the scales on a snake's back nor the rays of a fish's fin, but he does wish to know how the living snake looks and in the gorgeous but evanescent colors in which so many fishes are decked. The shrivelled, faded and often imperfect spirit specimen may furnish taxonomic facts to the naturalist, but the public should have something else.

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U. S. NATIONAL MUSEUM.