A HANDBOOK OF VERTEBRATE DISSECTION, PART I. HOW TO DISSECT A CHELONIAN

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A Handbook of Vertebrate Dissection, Part I. How to Dissect a Chelonian by H. Newell Martin & William A. Moale

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H. NEWELL MARTIN & WILLIAM A. MOALE

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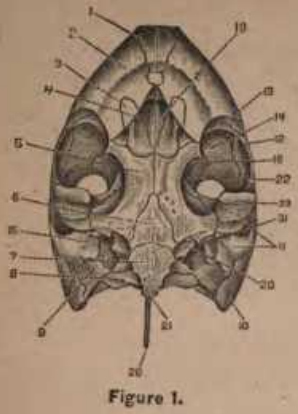
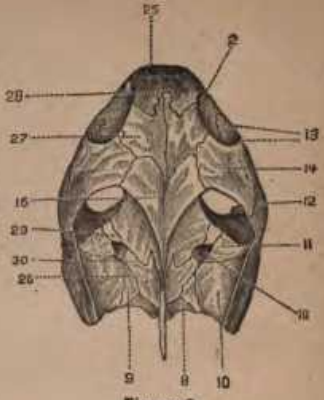


Figure 1.



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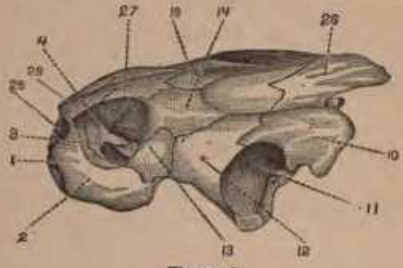

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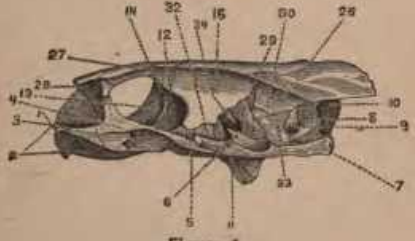

Figure 4.

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A HANDBOOK

OF

VERTEBRATE DISSECTION.

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PART I.

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PREFACE.

THE following pages, which contain directions for the practical study of the anatomy of a Chelonian, are the first instalment of a series which has had its origin in my own needs as a teacher, and which, when completed, will form a Handbook of Vertebrate Dissection.

Some years ago Professor Huxley published a little book called "Practical Biology," in the preparation of which it was my good fortune to assist him. That book was designed to give students commencing the study of biology a good knowledge, based on their own observations, of the structure and life-history of a number of typical plants and animals, with the object of laying a firm foundation for the further study of animal or vegetable morphology or physiology: it was, so far as I know, the first important educational step taken in recognition of the fact that there is a science of living beings, as such, quite apart from any division of them into animals and plants; and that the accurate observation of the phenomena presented by living forms of matter of all varieties forms the basis of one single science. This truth had, of course, been recognized long before, and was accepted by nearly all scientific

naturalists, but no really important step toward organizing the teaching of biology in accordance with it had previously been taken.

In the past five years, during which I have been responsible for the direction of biological studies in the Johns Hopkins University, I have endeavored to arrange the curriculum so as to ensure that each student, before taking up any one branch of biology for special study, shall have acquired a fairly good knowledge of what may be called general biology. No undergraduate is permitted to devote his time to the study of botany, or animal morphology or physiology, until he has spent at least one year in learning something about animals and plants in general. Such a course is indisputably far better than one more specially botanical or zoölogical for those who merely desire some knowledge of biological science as a part of general education ; and I have been yearly more firmly convinced that it affords also the best beginning for the student who desires to become ultimately a botanist, zoölogist, or physiologist.

While the general structure of all plants can be fairly well understood after the careful examination of a small number of selected types, this is not the case with animals ; and I have accordingly found it necessary to include in the annual course several types, especially vertebrate, not described in the "Practical Biology." Of these a Chelonian is much the most difficult to dis-

sect; and, partly for this reason, partly because the great persistence of vitality in its various organs after general death of the animal makes it extremely promising for physiological experiment, it was the one for whose dissection I first drew up laboratory directions for the use of my students. Finding them of great value in saving time to teacher and pupil, and also in preventing the waste of material which is apt to occur when a student sits down without specific directions to dissect an animal whose structure is almost entirely unknown to him, I thought they might be of use in other laboratories. I accordingly asked my friend and former pupil, Dr. William A. Moale, to assist me in preparing for publication detailed directions for the dissection of a number of vertebrate animals. The present pamphlet will shortly be followed by two others, containing directions for the dissection of a pigeon and a rat, both of which are well on the way toward completion. We intend ultimately to include in the series a bony and a cartilaginous fish, a lizard, and one of the large-tailed amphibia which form such a characteristic feature of the American Fauna.

In the present instalment of our work, *Pseudemys rugosa*, though far from being the most widely distributed of American Chelonia, is the species selected for description, mainly because it is sold in the markets here during the winter months, and was, therefore, readily obtainable by us. The fact that in many places this

particular species may not be found is of no importance, as the end in view is not to provide a monograph on any one species, but to show a student "How to dissect a Chelonian." The members of the order are so similar in all important points that the best method of examining the structure of one species is the best also for almost any other. I am not sure, in fact, that it is not better in all cases to provide students with species slightly different from the one described; their attention is kept more alert when they find they cannot altogether rely on the description in the book, but have to look at everything carefully for themselves.

These directions for dissection are of course not meant to be used by themselves, but to accompany lectures on the class and order of the type described, or the reading of a good text-book. Some knowledge of human osteology, which affords the best starting-point for every student of vertebrate morphology, is also assumed.

H. NEWELL MARTIN.

BALTIMORE, July 1, 1881.