

**THE VENTRICULIDAE OF THE CHALK:
THEIR MICROSCOPIC STRUCTURE,
AFFINITIES AND CLASSIFICATION;
INCLUDING FIGURES AND
DESCRIPTIONS OF EVERY SPECIES**

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Including Figures and Descriptions of Every Species by J. Toulmin Smith

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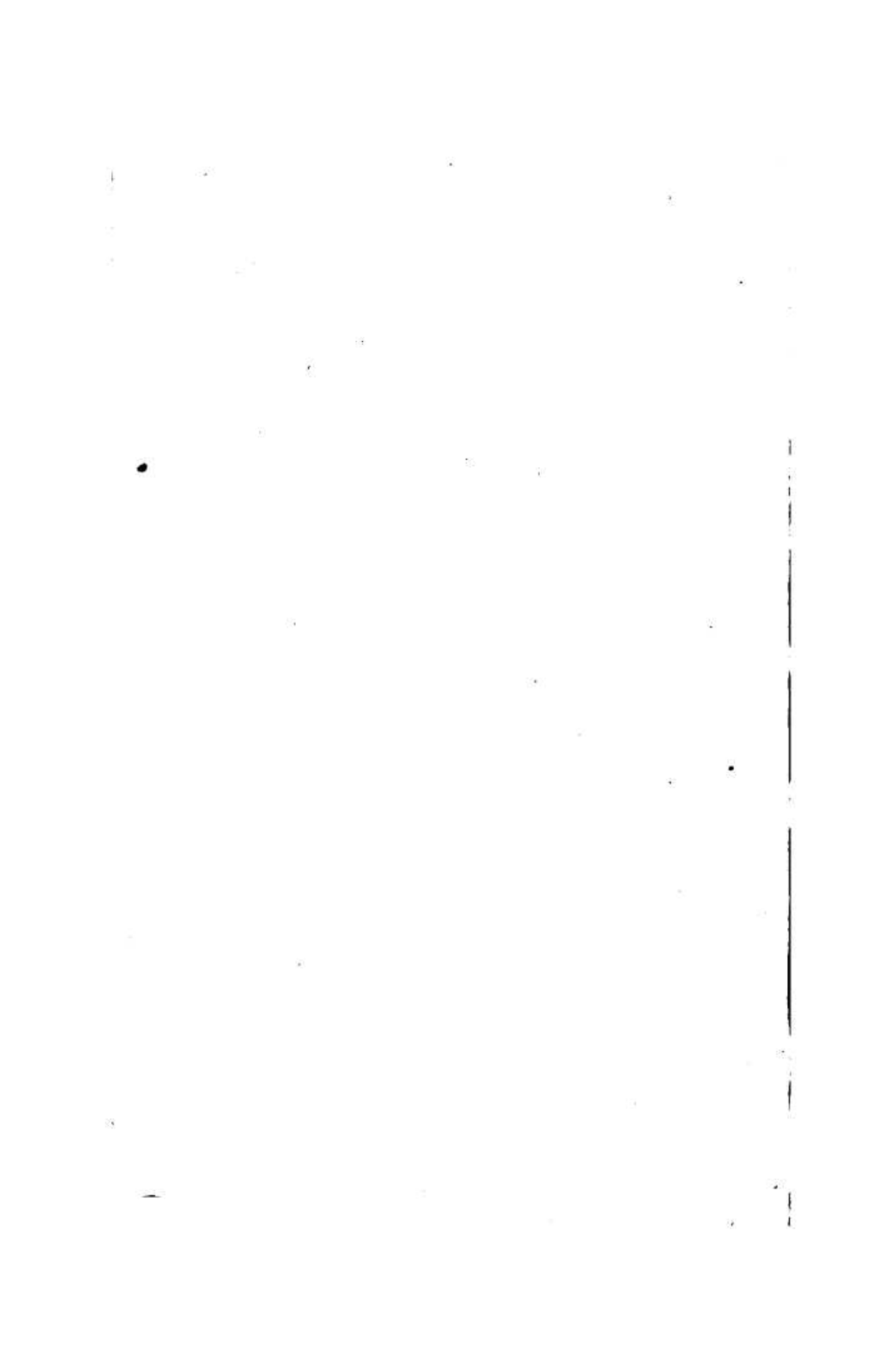
BY

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THE following pages first appeared in a series of papers published in the 'Annals and Magazine of Natural History,' to the courtesy of the proprietors of which Journal I am indebted for the opportunity of reprinting them. The first of those papers was published in August 1847, the last in May 1848.

The investigations carefully continued from the time of the publication of the first of those papers have served only to confirm, and greatly to strengthen the evidence of the truth of, the conclusions therein expressed. Should these investigations have served to open up the true reading of one page in an obscure, but most interesting, chapter of the great Book of Nature, the time and labour given to them will not have been mis-spent.

I have had much pleasure in acknowledging, at pages 10, 42, &c., my obligations to various gentlemen for their kind assistance.

An explanation of the Plates, fulfilling also the purpose of an INDEX, will be found at the end of the volume.

J. T. S.

Highgate, 20th May, 1848.

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THE remarks of Dr. Mantell in the 'Annals of Natural History' of the present month call for a few brief observations from me. I must always regret a difference of views from any one for whom I have a respect,—and especially with whom I have been in habits of friendly intercourse,—when, but only when, any feeling of reserve or asperity arises out of that difference of views instead of the cordial desire for still further discussion and investigation, and so getting, in the end, nearer to the truth.

Dr. Mantell imputes to me presumption in stating that "the field was an entirely untrodden one and the task a new one," and that "the nature of this class of animals was totally unknown before." I wish to make two answers to this imputation; first, as regards an implied denial of justice to himself; second, as to the matter of fact.

First, as to my notice of Dr. Mantell himself. In pp. 1 and 2 I use the following language. Having named Dr. Mantell's paper in the 'Linnæan Transactions' I add:—"That paper was but one among the many results of the indefatigable labours of its author in a field then little trodden and by few feet. * * It can be no reflection on the Discoverer of the Wealden and First Investigator of the Chalk to show that, amid the multitude of objects which engaged his attention, one was not followed out exhaustively." Again, on entering on the classification, I use, at p. 50, the following words:—"I have been unwilling, out of respect for the many labours of Dr. Mantell in the field of paleontology, to reject, as others have done without assigning any rea-

son, this generic appellation; * * I am glad that a modification in the meaning of the word enables me to retain a name which will always bring to the inquirer's recollection the long and successful labours of Dr. Mantell." The candid reader may judge from these and other passages whether I have wished to depreciate the labours of Dr. Mantell or his reputation.

Second, as to the matter of fact. The question simply is, *what is knowledge* of a class of animals. I apprehend that "knowledge" of any creature is not merely the sight, or bare handling, or even giving an arbitrary name to a specimen; it must imply some knowledge of structure and functions, in the same way as Professor Owen justly tells us that "the *knowledge* of the organized beings now called *Polypi*, as members of the animal kingdom, is of comparatively recent introduction" (Comp. Anat. i. p. 81), though these had been seen and handled on the sea-shore for ages. I certainly must repeat the assertion that, previously to the publication of my papers,—papers as to which Dr. Mantell himself has been pleased to say that "the subject has recently been investigated by a gentleman of distinguished ability" (Wonders of Geology, 6th ed. p. 638),—the nature of these beautiful fossils was "*totally unknown*." Neither Dr. Mantell nor any previous writer had ever even suspected the existence of any membrane whatever in the Ventriculidæ. On the other hand, "I have demonstrated that the basis of the Ventriculidæ is a simple unperforated membrane; that, therefore, the descriptions so long before the world, and so often repeated, are fundamentally erroneous,—the conclusions as to the æconomy of the animal being necessarily, therefore, as fundamentally erroneous" (p. 48 note). In addition to this, and other points to which I cannot now allude, I have discovered and described and figured, as existing in this membrane, an entirely new form of animal structure; of which Dr. Mantell himself has said (somewhat in inconsistency with what he now considers as due to his courteous readers):—"Of the accuracy of Mr. Toulmin Smith's beautiful microscopic examination of the intimate tissue of these zoophytes I have no doubt; and will only remark that the octahedral form, represented as that assumed by the inosculating fibres of the membrane of the Ventriculidæ, is a very extraordinary anomaly in animal structures." (Wonders of Geology, 6th ed. p. 638 note.) I think Dr. Mantell's own words, addressed to the very readers whom he now twice assures of his own accuracy, and whom he is so anxious to treat with all due courtesy, are the best testimony that he is doing me injustice.

I am surprised that Dr. Mantell should speak of an "incongruous assemblage" of forms. I might take almost any family of either animal or vegetable kingdom to show the futility of

this objection. The *Acacias platyptera*, *pendula* and *grandiflora* are, for instance, at first sight, almost as incongruous as are *Tubulipora patina*, *Gemellaria loriculata* and *Halodactylus diaphanus*.

I doubt not that when the first priest of old nailed to the column's head, after the solemn sacrifice was done, the scalp which he had torn off the devoted ram, he thought he knew very well what a ram's head was, and would have pitied any unhappy wight who might have suggested any resemblance between the head and the tail of the beast which had just smoked upon the altar. It has been reserved for modern science not only to suggest but to demonstrate, by one of the most beautiful, most logical, most philosophical, and at the same time most scientifically important trains of investigation that has been ever followed up, that between these so "incongruous" parts there are clear and positive homologies, and that no one can truly "know" either part who does not study those homologies. It has been by treading, though at an humble distance, and, I am fully conscious, with a too faltering step, in the path by which those important truths have been obtained that I have arrived at what Dr. Mantell thinks fit to term "sublime transcendentalisms;" but which, to my mind, constitute, in every branch of science, the main charm, and the most important end, of the pursuit.

In conclusion I may be allowed to say, that it is of little importance to the world what may be Dr. Mantell's *opinion* or my own on the present matter; but it is of importance whether, in pursuing the subject, any fragment of truth has been got at. I had hoped Dr. Mantell would have discussed my facts and arguments, and not "replied" to my conclusions. I hope that he will do so yet. It is only by full discussion, close examination, and careful consideration that the truth or falsity of my conclusions can be tested. Such discussion, examination and consideration I shall be ready and most glad to meet from any one in a fair and cordial spirit. But all hope of truth and all scientific investigation is at an end, if it is to be considered as a "reply" to a long and most carefully conducted train of investigation that, some years before, one or two of the objects whose natural history and relations are thus elucidated had been described in quite a different way; and that, *therefore*,—for that is Dr. Mantell's only argument,—the more recent investigations must be all wrong. I am glad to say that my collection has been already visited by several of the most eminent paleontologists and anatomists of this country; and I know that some of these, who have the most carefully examined the series, are satisfied of the truth of my conclusions. Of the opinion of others I have perhaps no certain information at present; but I will only add, that, to these or any