DR. WILLISTON ON "THE FOSSIL TURTLES OF NORTH AMERICA"

IN SCIENCE of December 4, 1908, Dr. S. W. Williston has published a review of my book, "The Fossil Turtles of North America." This review showed as much appreciation of the merits of the book, and as much leniency towards its shortcomings, as its author could desire. However, one or two matters referred to by Dr. Williston seem to require notice; and this is here respectfully presented.

Dr. Williston takes issue with my division of the turtles into the Athecæ and the Thecophora. To this I will say that unless the early turtles separated primarily into the ancestors of the two groups mentioned, these two suborders are not at all worthy of recognition.

As to the resemblances between the leather-back and the other sea-turtles, I will, to illustrate, consider the flippers. The limbs of the primitive turtles were, I believe, not greatly different from those of the snapper, for example. Inasmuch as the ancestors of the leather-back and those of the other sea-turtles started with the same form of fore limb and on entering the water employed this limb in the same way, it is not strange that their descendants have closely similar flippers. The fore limbs of the Trionychidæ have certainly been independently developed, and yet they are being modified in the same direction. Those of *Carettochelys* are another example. If a thoroughly aquatic pleurodire shall ever be discovered it will doubtless have similar fore limbs.

As regards the two dermal coverings of the primitive turtles, I may remark that the early reptiles probably had as great need of armor as their modern descendants. A modern crocodile seems to have need of only a single layer of dermal bones, the so-called abdominal ribs, in the lower wall of its belly; but a cayman requires, in addition to this, an armor of closely jointed bony scutes. The leather-back itself actually possesses the two bony coverings in question. Ventrally the plastron of dermal bones is covered by rows of osseous scutes, while on the upper surface the nuchal bone is found to be overlaid by a portion of the mosaic-like bony armor. Who is to say that never were there under this mosaic of the upper surface also peripheral bones, and even costal plates?

Dr. Williston is certainly correct in holding that the elements that I have called fascia bones are of dermal origin. The dermal bones that had sunken beneath the skin I thus named, in order to distinguish them from a more superficial stratum.

As evidences for the existence of two dermal bony coverings in the primitive turtles I present for consideration the fact that the leather-back has as many longitudinal zones of bony scutes as the most generalized turtles have of horny shields, and the additional fact that the horny shields do not coincide with the bones which they overlie, but break joint with them.[1]

Dr. Williston says that "*Toxochelys* possesses neural ossicles, while the nearly related and less aquatic *Porthochelys* is without them." In like manner, the alligator snapper possesses a series of supramarginal horny shields, an ancient inheritance, while the common snapper has lost them. *Porthochelys* retained the nasal bones, but *Toxochelys* did not.

My friendly reviewer is in error when he states that I hold that in *Toxochelys* there are only vestiges of the inner layer of dermal bones. The nuchal, the costal plates (except that part belonging to the true ribs), the peripheral bones, and the whole plastron, belong to the inner layer.

Dr. Williston mentions the fact that I have omitted mention of two turtles that have got into literature. One of these is from the Dakota sandstone of Kansas, a formation that has furnished no other remains of the order. This specimen[2] is the cast of the cavity of the shell, with indications of some of the ribs. The relationships of the turtle are indeterminable and fortunately no name has been given the specimen. The other turtle referred to was originally briefly described by Dr. Willis-

[1] See *American Naturalist*, XXXII., 1898, pp. 929–948.

[2] *Trans. Acad. Sci.*, XVI., 1899, p. 67, pl. iv.

ton himself.[1] It had been discovered in the Benton beds of Kansas and is stated to consist of some fragmentary ribs and a part of a humerus. The species is supposed to be related to *Protostega,* but here again no name was imposed on the specimen. Dr. Williston pays me the compliment of regretting that I did not describe these materials, with which he could do little himself.

Oliver P. Hay

Washington, D. C.,
January 7, 1909

QUOTATIONS

AMMUNITION AGAINST THE ANTI-VIVISECTIONIST

As antagonism to vivisection is a form of incurable insanity, those who suffer from it are wholly indifferent to argument or facts, and their delusional convictions urge them irresistibly to constant repetition of the same mad acts, quite regardless of consequences to themselves or others. Hence is it that year after year these unfortunate people renew their efforts to secure legislative interference with or prohibition of the experiments with living animals upon which the progress of medical science depends and without which medical practise would be reduced to blind, or at least dim-eyed, empiricism.

That the anti-vivisectionists always find somebody to introduce their bills is a sad commentary on the intelligence of legislators, but this year, as so often before, the battle with well-intentioned ignorance must be fought again. There are now a few more triumphs over disease with which to confront the wild assertions and accusations of the agitators, but dependence must still be placed on arguments the adequacy of which has already been proved a hundred times—so often, indeed, that many of the same people whom they long since convinced have half forgotten essential parts of the evidence upon which the animal experimenters rely as a defense from the hampering restrictions that unreasoning sentimentalists would impose upon one of the most unselfish and successful classes of workers for the common good.

There is danger in this forgetfulness, and to meet it the Committee on Experimental Medicine of the New York State Medical Society has begun the publication of a series of leaflets setting forth clearly and briefly the scientific and medical side of the vivisection controversy. One by Dr. E. L. Trudeau deals with "Animal Experimentation and Tuberculosis," another by Dr. James Ewing takes up with cancer research, and a third by Professor F. S. Lee treats of "The Sense of Pain in Man and the Lower Animals." Dr. Simon Flexner's contribution tells what vivisection has accomplished in the war against infectious diseases, and Dr. S. J. Meltzer discusses "The Function of the Thyroid Gland—an Important Chapter of Modern Medicine." A leaflet of a different kind is one giving eminent lay opinions, among those quoted in it being ex-President Eliot, of Harvard; President G. Stanley Hall, of Clark University; President E. H. Capen, of Tufts College; Bishop William Lawrence, of Massachusetts, and Dean Hodges, of the Cambridge Theological School. Dr. William H. Park takes up the great subject of "Diphtheria," the disease which would still be slaying its thousands had it not been absolutely conquered through vivisection alone.

Copies of these and other leaflets can be obtained upon application at the Academy of Medicine, 17 West Forty-third Street. They are intended especially for physicians, but they are full of ammunition which anybody can use in answer to silly talk about the cruelty or the uselessness of a method of investigation which is neither the one nor the other, but is, on the contrary, one to which animals and men alike are incalculably indebted for relief from pain.—New York *Times.*

AN IDLE CHALLENGE

This characteristic communication comes to us from the president of the Anti-Vivisection Society:

To the Editor of The Evening Sun—*Sir:* Regarding your editorial attack in *The Evening Sun* of January 27 upon a leaflet issued by this society, I would say that I should be glad to have you attempt at our mass meeting (to be held at Car-

[1] *Kansas Univ. Quarterly,* I., 1902, p. 247.