

CONTRIBUTIONS FROM THE MUSEUM OF PALEONTOLOGY

*(Continuation of Contributions from the Museum of Geology)*

UNIVERSITY OF MICHIGAN

VOL. III, No. 10, pp. 183-185 (1 pl.)

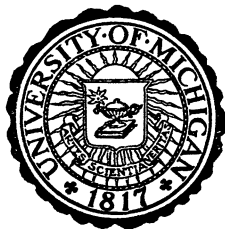
DECEMBER 18, 1931

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LIFE MODELS OF THE HEADS OF TWO  
TYPES OF PHYTOSAURS

BY

E. C. CASE



UNIVERSITY OF MICHIGAN PRESS  
ANN ARBOR

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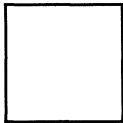
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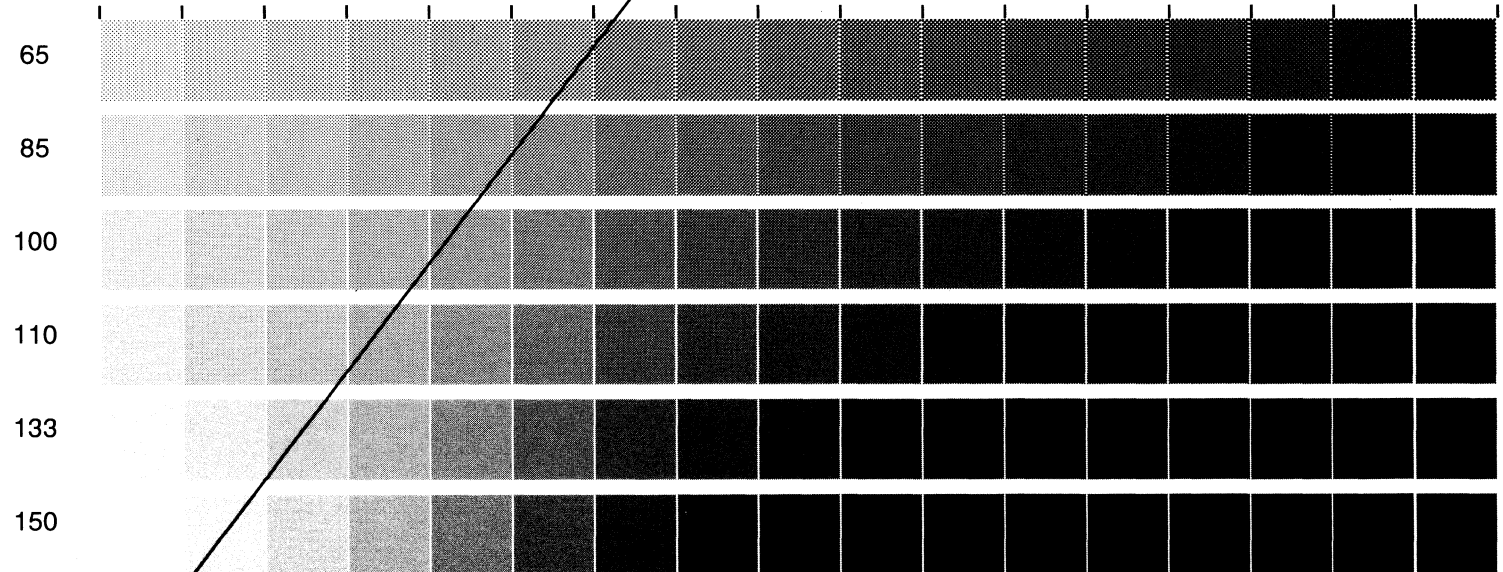
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## MESH HALFTONE WEDGES





# CONTRIBUTIONS FROM THE MUSEUM OF PALEONTOLOGY

(Continuation of Contributions from the Museum of Geology)

## UNIVERSITY OF MICHIGAN

Editor: EUGENE S. McCARTNEY

The series of contributions from the Museum of Paleontology was inaugurated to provide a medium for the publication of papers based entirely or principally upon the collections in the Museum. When the number of pages issued is sufficient to make a volume, a title-page and a table of contents will be sent to libraries on the mailing list, and also to individuals upon request. Communications with reference to exchange or purchase of copies should be directed to the Librarian, General Library, University of Michigan.

### VOLUMES I-II

A list of the papers published in these volumes may be had upon application.

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1. Indications of a Cotylosaur and of a New Form of Fish from the Triassic Beds of Texas, with Remarks on the Shinarump Conglomerate, by E. C. Case. Pages 1-14, with 1 plate. Price, \$.25.
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8. On the Lower Jaw of *Brachysuchus megalodon*, by E. C. Case. Pages 155-161, with 5 plates and 2 text figures. Price, \$.30.

(Continued on inside of back cover)

## LIFE MODELS OF THE HEADS OF TWO TYPES OF PHYTOSAURS

By E. C. CASE

OUR knowledge of the phytosaurs is still very far from permitting an adequate understanding of the group. Many forms have been described from incomplete material and, without doubt, many of the generic and specific names proposed will be shown eventually to be synonyms. Until fortunate discovery shall place in our hands a complete skeleton with the armor in place we shall be unable to differentiate the various forms and to determine how much of the described differences is to be attributed to systematic difference, how much to sex, age or individual variation.

The abundant material in the possession of the Museum of Paleontology of the University of Michigan, comprising four very perfect skulls, a fifth nearly as good as the others, and a large amount of less complete cranial and axial skeletal material, permits the differentiation of some types with certainty.

It is obvious that, whatever may be the meaning of the elevation of the rostral region, or the character of the nasal opening as to sex, age, or specific differentiation, the feeding habits of the phytosaurs were markedly different in different groups. This is amply attested by the proportions of the skull and the character of the teeth, and has long been recognized. The author has described in detail the skull of *Brachysuchus megalodon* and has pointed out<sup>1</sup> that the relative shortness of the snout, the heaviness of the bones, the large size and weight of the teeth, all indicate that the animal preyed upon heavily armored forms, such as individuals of its own group and the great stegocephalians which lived in the same bodies of water. This evidence is supported by

<sup>1</sup> "On the lower jaw of *Brachysuchus megalodon*," Vol. 3, No. 8, in this publication.

the presence of injuries incurred during life when the powerful jaws were crashed together over some resistant armor.

Opposed to this type was the much lighter type with long, slender jaws and weaker teeth. The length of the jaws permitted a quick snap best adapted to seizing an agile prey.

In both groups the teeth at the anterior end are long and tusk-like, fitted for apprehension and, by their interlocking, the holding of any struggling victim. It is in the posterior teeth that the difference is very apparent. Those of the armor-crushing type are proportionately much heavier than those of the long-nosed fish-eating type.

In an effort to express this difference the author encouraged Mr. Carleton W. Angell, artist in the University Museums, to attempt life models of the heads of two typical forms. The specimen selected for the armor-crushing type was the skull and lower jaw of *Brachysuchus megalodon*, numbers 10336 and 10336B, U.M. The model was criticized during the course of completion by President Alexander G. Ruthven, whose position as an authority upon reptiles is well known, by other workers upon reptiles in the Museum of Zoology, and by the author. The result is shown in Plate I, Figure 1. Mr. Angell preserved most carefully the proportions of the skull and the location of all important points. The dermal covering of the temporal and antorbital openings and the external opening of the lower jaw are shown flattened and somewhat smoother than the skin of the rest of the skull, since, with the mouth open, the muscles would be in a relaxed condition and the skin in this region must have had a greater flexibility than that over the other portions of the skull. The eyes are shown small, in adaptation to the aquatic habitat. The otic region is shown as covered by a flap of integument, as is common in such forms.

The material selected for the model of the smaller fish-eating type was the skull of *Rhytiodon carolinensis* as restored and figured by McGregor.<sup>2</sup> This form shows the greatest extreme of specialization in its peculiar adaptation and is the one for which the

<sup>2</sup> *Memoirs of the American Museum of Natural History*, Vol. 9, Part II. 1906.

PLATE I

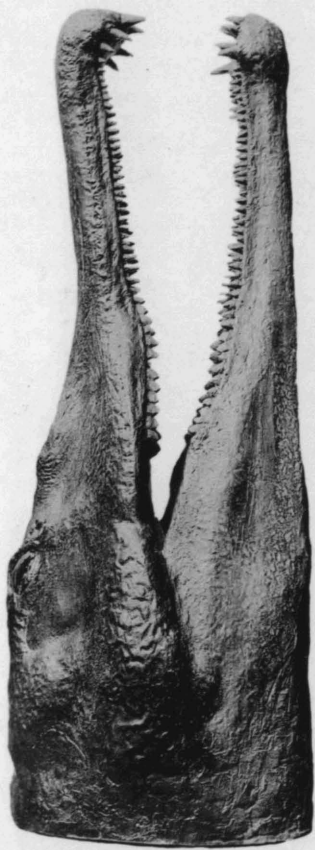


FIG. 1. Life model of head of *Brachysuchus megalodon*.  $\times$  about  $\frac{1}{6}$



FIG. 2. Life model of head of *Rhytiodon carolinensis*.  $\times$  about  $\frac{1}{6}$





measurements and proportions were most dependable. The model is shown in Plate I, Figure 2.

Both models have been made one-third natural size. The differences in size and proportion are most strongly brought out in the models. Remains of forms fully as light and slender as *Rhytiodon carolinensis* have been found in the Dockum beds of western Texas and we may be certain that the differences in morphology are evidence of difference of habit and not of geographical separation.

The characters of specimens described as *Mystriosuchus*, *Pro-mystriosuchus*, *Leptosuchus* and *Machaeroprotopus* prove that there were many intermediate types between the extremes shown in the models, and this is perhaps the best evidence we have as yet for the existence of a large number of generically and specifically distinct forms.



(Continued from inside of front cover)

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