

ARTICLE II.—*Note on Squalodont Remains from Charleston, S. C.*
 By J. A. ALLEN.

Squalodon tiedemani, sp. nov.

PLATES V AND VI.

In a collection of fossils from Charleston, S. C., kindly presented to the American Museum of Natural History by Mr. I. B. Tiedeman, is an interesting fragment of the skull of a Squalodon, consisting of the anterior portion of the upper jaw, 50 cm. in length, with the teeth and bones still *in situ* (see Pl. V, and Pl. VI, fig. 1). The teeth are all more or less broken at the point; the third premolar on the left side is lacking; the fourth on the same side is broken off just below the alveolar border; the fifth has lost its apical half, and the greater part of its single-rooted fang is exposed by the absence of the outer wall of the alveolus. Both intermaxillaries also lack the posterior third of their length, and two or three inches of their anterior extremities are broken away, leaving the fangs of some of the incisors exposed. This fragment represents a large part of the anterior rostral portion of the cranium.

The specimen was obtained, according to Mr. Tiedeman, in dredging phosphatic material from the Wando River at Charleston, this material occurring in detached fragments in the mud of the river bottom; it is thus presumably an erratic from the Phosphate beds of the neighboring region. The dimensions of the specimen are as follows:

Total length	500 mm.
Length of alveolar border of right maxillary (including six teeth)	300 "
Length of alveolar border of left maxillary (including five teeth)	225 "
Breadth of the palatal surface at the 5th premolars.....	65 "
Distance between external alveolar borders of the maxillaries at the 5th premolar.....	130 "
Breadth of the palatal surface at the 2d premolars.....	58 "
Distance between the external alveolar borders of the maxillaries at 2d premolars.....	95 "
Distance between canines at base	50 "
Distance between outer borders of canines near the apical extremity	110 "
Distance between the outer incisors at alveolus.....	30 "

Distance between outer edges of outer incisors at alveolus....	65 mm.
Transverse diameter of the right outer incisor at alveolus....	23 "
Antero-posterior diameter of the right outer incisor at alveolus.	24 "
Transverse diameter of right canine at alveolus.....	23 "
Antero-posterior diameter of right canine at alveolus.....	24 "
Transverse diameter of 1st premolar.....	22 "
Antero-posterior " 1st "	24 "
Transverse " 2d "	22 "
Antero-posterior " 2d "	24 "
Transverse " 3d "	22 "
Antero-posterior " 3d "	25 "
Transverse " 4th "	23 "
Antero-posterior " 4th "	28 "
Transverse " 5th "	25 "
Antero-posterior " 5th "	32 "

The teeth are all, as already stated, more or less broken at the point, and portions of the outer layer have fallen away in several of them, particularly toward the point. It is consequently not possible to give the full length of the teeth above the alveolus, nor the length of their fangs, in consequence of the teeth being still firmly implanted in the jaw.

The teeth number seven in a linear series along each margin of the jaw, with a portion of the eighth on the right side. A portion of the fang of an inner incisor, directed nearly horizontally forward, is seen on the right side; on the left the corresponding tooth is wholly broken away. The outer incisors are but little smaller than the canines and the anterior premolars. The teeth are all cylindrical in form, the crowns tapering and conical, directed slightly forward and outward, and a little recurved—the outer incisors, canines, and first two premolars distinctly so. The fifth premolar is decidedly flattened, the tooth behind it still more so, judging from what remains of its alveolus, but whether two-rooted is not distinctly shown. The two diameters of the first four premolars are nearly equal. The canines are slightly flattened laterally.

The intermaxillaries are widest in front, and taper gradually and nearly uniformly backward to a point opposite the fifth tooth. From this point posteriorly they are broken away, but the space they formerly occupied shows that they gradually widened again, till at a point about opposite the first molar their width was the same as at their anterior border.

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The palatal surface is nearly flat, and widens very slightly posteriorly; there is a deep narrow mesial furrow, marking the junction of the palatal borders of the intermaxillaries. The suture between these bones and the maxillaries is also marked by a slight groove. Both the width and thickness of the rostrum are nearly uniform from the incisive border to the first two-rooted molars, with evidence of slight expansion from about this point (the proximal end of the fragment in question) posteriorly. The edge of the maxilla is deeply hollowed at the intervals between the teeth, for the reception of the points of the corresponding teeth of the lower jaw.

There are also in the American Museum of Natural History two mandibular fragments which I also refer to the present species. They are from the Holmes Collection, and are labeled as coming from the Ashley River, South Carolina. One (see Pl. VI, figg. 2-4) is a fragment, without teeth, of a left ramus—a section 160 mm. in length from near the anterior extremity. It contains four complete alveoli, in front of which is seen the posterior wall of another, and behind them part of the alveolus of a sixth tooth. The last complete alveolus is considerably flattened laterally, and indicates that its tooth was double-fanged. The one preceding this is also somewhat flattened, and there are indications that it was occupied by an imperfectly double-rooted tooth. The other alveoli are circular in outline and their teeth were evidently single-rooted. The first alveolus has a breadth of 27 mm., a length of 36 mm., and a depth of 53 mm. The corresponding dimensions of the second are respectively 28 mm., 35 mm., and 56 mm. The third has the same width and length, but is filled at the bottom with matrix. The fourth has a width of 26 mm., and a length of 38 mm.; it is broken away at the bottom. The first two alveoli have the form of hollow cones, sloping and somewhat curved backward.

This fragment thus terminates posteriorly at the front edge of the alveolus of the second double-rooted tooth, and ends anteriorly at the middle of the alveolus of probably the second (perhaps the third) 'premolar.'

The inner face of the ramus is nearly flat and almost straight; the outer surface is slightly rounded or convex; the lower border is rather thin and angular at the anterior end of the fragment, becoming gradually thicker and more rounded toward the posterior end. The thickness of the jaw at the anterior end, just below the alveolar border of the third premolar, is 35 mm.; at the posterior end, at the alveolus of the second double-rooted molar, the thickness is about 53 mm. The depth of the jaw at the same points is respectively 64 mm. and 75 mm.; the ramus considerably increasing in size posteriorly. The alveoli lie nearest the outer edge of the jaw anteriorly, but nearest the inner margin posteriorly, the axis of the tooth-line being somewhat oblique to that of the ramus. On the outer margin of the jaw, between the alveoli, is a concavity for the reception of the alternating teeth of the maxilla. On the outer surface are three tubular grooves, directed backward, one opposite each of the last three alveoli.

The other fragment is a portion of a right ramus, less perfectly preserved, and representing a more posterior part of the mandible. It is 335 mm. in length, and contains two complete alveoli, and portions of two others posterior to these. The outer face of the fragment is nearly twice as long as the inner; the alveolar border is left intact for only about 130 mm. The lower border is also much broken away—nearly to the base of the alveoli. The two complete alveoli, situated near the anterior end, seem to correspond with the fourth and fifth of the other fragment. The second alveolus, like the one preceding it, was occupied by a single-rooted tooth. The tooth next succeeding was probably double-fanged; the imperfect condition of the alveolus renders this point not positively determinable. The outer edge of the mandible thickens rapidly behind the second alveolus, but the alveolar border continues nearly straight, slightly rising apparently at the extreme proximal end of the fragment.

In size these two specimens correspond very nearly with the above described rostral fragment.

The larger Squalodont remains hitherto described from the vicinity of Charleston, S. C., have been referred to *Squalodon holmesi* Leidy. Those here described, however, indicate a species of much larger size, and on this account perhaps might be pro-

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visionally referred to *Squalodon atlanticus* Leidy, based on remains from the Miocene of Maryland and New Jersey. As, however, all we know of either of these species rests on a few detached teeth, which do not agree satisfactorily with those of the specimens here described and figured, it seems better to indicate by a new name the species represented by these characteristic fragments, and await the acquisition of additional material for the determination of its relationship to the larger Squalodonts of the Atlantic coast. I therefore take pleasure in naming the present species *Squalodon tiedemani*, in honor of its discoverer, Mr. I. B. Tiedeman, of Charleston, S. C., to whom the Museum is indebted for a valuable collection of fossils, including the specimen here described.

Squalodon tiedemani is apparently rather nearly related to *S. antverpiensis*, but considerably exceeds it in size.

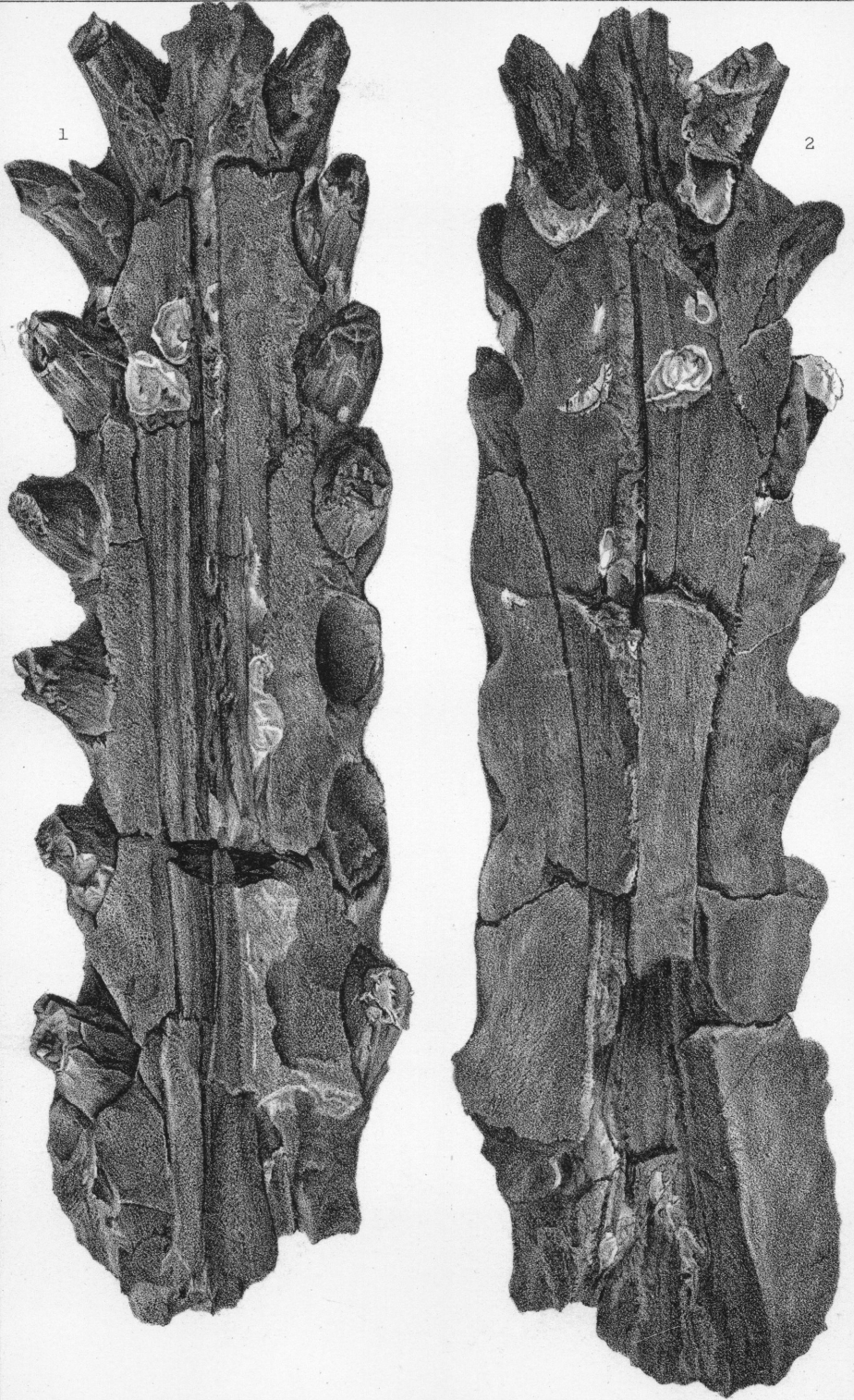
DESCRIPTION OF PLATES V AND VI.

Squalodon tiedemani.

PLATE I.—Rostral portion of skull, $\frac{1}{3}$ natural size.

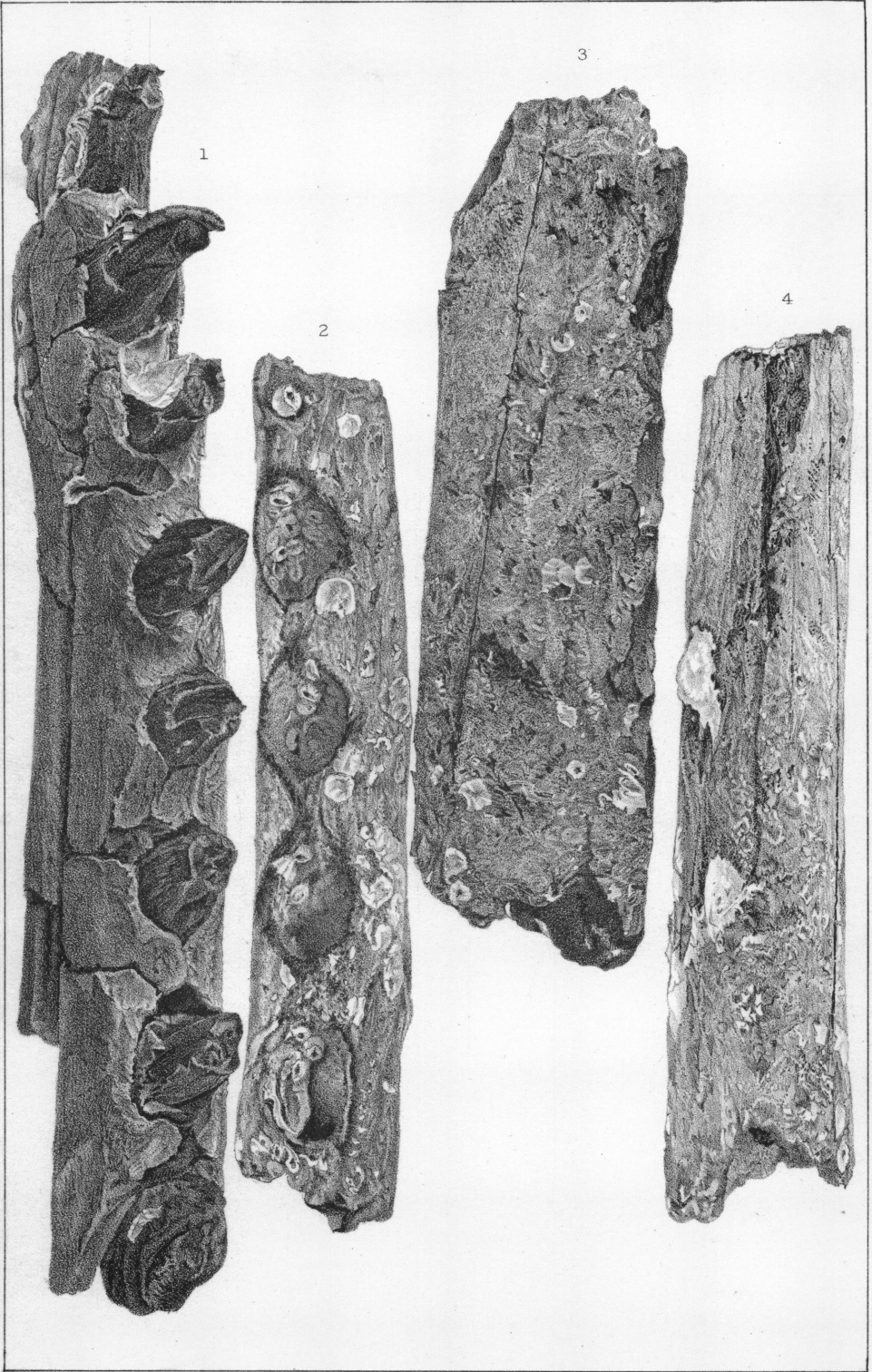
PLATE II.—*Fig. 1.* Rostral portion of skull, $\frac{1}{3}$ natural size.

Figg. 2-4. Part of mandibular ramus, $\frac{1}{3}$ natural size.



SQUALODON TIEDEMANI.

$\frac{1}{3}$ Natural Size.



SQUALODON TIEDEMANI.
2/3 Natural Size