

# DESCRIPTION OF MESOPLODON MIRUM, A BEAKED WHALE RECENTLY DISCOVERED ON THE COAST OF NORTH CAROLINA.

By FREDERICK W. TRUE,  
*Assistant Secretary, Smithsonian Institution.*

On July 29, 1912, the United States Bureau of Fisheries transmitted to the United States National Museum a barrel containing the head, tail, and pectoral of an adult female beaked whale of the genus *Mesoplodon* which stranded on the outer bank of Bird Island Shoal in Beaufort Harbor, North Carolina, three days earlier. On examination the specimen was found to represent a new species, a diagnosis of which was published under the name of *Mesoplodon mirum* in the Smithsonian Miscellaneous Collections.<sup>1</sup>

The director of the Fisheries Laboratory at Beaufort, Mr. Lewis Radcliffe, furnished the following data regarding the whale, together with a photograph, which is reproduced in Plate 52:

Apparently the whale had been swimming about among the shallow channels on Bird Island Shoal and was caught just inside the outer edge of the shoal by the falling tide. It was first sighted by launch No. 316 about 10 a. m. and the report brought back to the laboratory about noon. At 1.30 p. m., when visited, it had been badly mutilated by visitors (see photograph). The following data were obtained at this time:

	Ft. in.
Total length.....	16 0
Width of tail (flukes) about.....	4 8
Tip of snout to origin of dorsal.....	9 0
Tip of snout to origin of pectoral.....	3 8
Tip of snout to vent.....	11 0
Length of pectoral.....	1 8
Greatest depth of body.....	3 5

Color: Back, slate-black; lower sides, yellow-purple, flecked with black; median line of belly somewhat darker; a grayish area in front of vent; fins the color of the back.

Body covered with a thick layer of fat; flesh beneath this layer very dark red, of loose texture, coarse and stringy.

Walls of all the chambers of the heart comparatively thin. Weight of heart, 10.5 pounds; length from base of atria to tip of ventricles, 14.5 inches; width at base of ventricles, 11 inches.

<sup>1</sup> Smiths. Misc. Coll., vol. 60, No. 25, March 14, 1913.

Stomach divided into three chambers; first chamber large and empty; second and third chambers smaller and filled with whitish fluid. The nature of the food could not be determined. Length of intestines, 68 feet; no cæcum present.

Kidneys made up of many small lobules, each of which resembles a miniature mammalian kidney, showing distinct pelvis, calyces, and renal pyramids. These lobules are loosely aggregated and held together by connective tissue. Left kidney: Length, 15.5 inches; width, 7.5 inches; thickness, 1 to 1.75 inches.

I believe this form is not uncommon here. Large cetaceans which answer its description are not infrequently seen swimming about the laboratory, three being sighted at one time. In swimming, the dorsal fin is seen above the water, and at times it resorts to the bounding motion not unlike the porpoise.

Mr. Russel J. Coles reported harpooning a large porpoise early in July. He cut out a small piece of flesh to try its edible qualities and let it go adrift. Later, when decay has gone far enough to permit, an attempt will be made to secure at least a part of the skeleton.

Local name: Cowfish.

The head and other parts were received at the Museum during my absence from Washington. Upon my return, with the aid of Messrs. J. W. Scollick and A. B. Thorne, measurements were made of the head, and afterwards some photographs (Plate 53) and a mold were prepared. The skull and the bones of the tail were then extracted and cleaned. The following measurements were made of the head:

	Inches.	mm.
Tip of upper jaw to angle of mouth.....	14.5	368
Tip of upper jaw to center of eye.....	24.5	622
Tip of upper jaw to left angle of blowhole.....	23.0	584
Tip of upper jaw to center of anterior border of blowhole.....	24.25	616
Breadth of blowhole.....	4.25	108
Length of beak.....	7.5	191
Breadth of beak at the base.....	4.0	102
Length of throat furrows.....	7.75	197
Distance between furrows anteriorly.....	0.75	19
Distance between furrows posteriorly.....	4.75	121
Length of eye.....	1.33	35
Girth at eye.....	48.5	1,232
Breadth of flukes.....	44.0	1,118
Depth of caudal peduncle at junction with flukes.....	10.75	273

The lower jaw was only a very little shorter than the upper, and its superior border was concave. There was no appearance of teeth in either upper or lower jaw, and it was not until the integuments were removed that two small teeth were discovered, lying close to the extremity of the mandible. These teeth are small, conical, and acute, and are strongly inclined forward and a little outward. The presence of teeth in this position at once suggested that the species was either an undescribed one, or else *M. hectori* Flower, of New Zealand. An examination of the skull showed, however, that the proportions and general conformation were quite unlike those of *hectori*. On the other hand, it presented a very close resemblance to *M. europæus* in many particulars. It might be supposed that the peculiar position of the

teeth was characteristic of the female of that species, but both sexes of the latter are known, and both have the teeth near the posterior end of the symphysis. There seems to be sufficient reason, therefore, to regard the Beaufort specimen as representing a new species. It was therefore described under the name of

MESOPLODON MIRUM True.

*Mesoplodon mirum* TRUE, Smiths. Misc. Coll., vol. 60, No. 25, p. 1, March 14, 1913.

*Type-locality*.—Bird Island Shoal, Beaufort Harbor, North Carolina.

*Type-specimen*.—Cat. No. 175019, U.S.N.M. A skull with mandible and partial skeleton from an adult female 16 feet long which stranded in Beaufort Harbor, North Carolina, July 26, 1912. Obtained by the United States Bureau of Fisheries Laboratory, Mr. Lewis Radcliffe, director.

*Diagnosis*.—Teeth at the extremity of the mandible, small, entirely concealed by the integuments (in the adult female). Mandibular symphysis one-fourth the length of the mandible. No basirostral groove. External free border of the lachrymal bone one-half the length of the orbit; its anterior end curved upward and appearing on the superior surface of the skull where it joins the antero-external angle of the frontal plate of the maxilla. Maxillary prominences short and directed obliquely outward anteriorly, the extremity close to the maxillary notch. Maxillary foramina behind the premaxillary foramina. Frontal plates of the maxillæ approximately one-half as broad as long.

SKULL.

Plates 54-56.

*Superior aspect*.—Apex of the supraoccipital at the vertex rounded, extending forward about one-half as far as the recurved internal borders of the frontal plates of the maxillæ. The frontals form an irregular area of small extent at the vertex. Nasals elongated, wedge-shaped, with the truncated apices directed forward. Frontal plates of maxillæ about half as broad as long, their supero-internal recurved borders behind the proximal ends of the premaxillæ directed outward, rather than forward or backward. Proximal ends of premaxillæ short and thick, directed outward; portion at the sides of and in front of the nares as in *M. europæus*. Maxillary prominences large, short, and directed obliquely outward rather than forward as in *M. europæus*. On account of their relatively slight projection anteriorly, their apices are not as far from the bases of the anteorbital notches as in *M. europæus*, *M. hectori*, etc. The base of the notches is occupied by the maxilla, malar and lachrymal in about equal proportions. External free border of the rostrum strongly emarginate at the proximal end but straight more anteriorly, the beak tapering

gradually to the apex, without the convexity at the middle of its length which is characteristic of *M. europæus*. In the basal half of the beak the upper surface of the maxillæ is horizontal, but in the distal half beveled, or inclined outward. Internal free borders of premaxillæ widely separated opposite the base of the beak, more closely approximated anteriorly, but again diverging at the apex. The mesirostral bone occupies the proximal two-thirds of the vomerine trough. It is depressed below the upper surface of the premaxillæ and divided unsymmetrically into two flat portions the surfaces of which are inclined toward each other.

*Lateral aspect.*—Outline of occipital moderately convex. Condyles strongly projecting. Superior border of frontal plates of maxillæ nearly horizontal and nearly as long as the temporal fossæ. The latter pyriform, with the superior border only moderately concave.

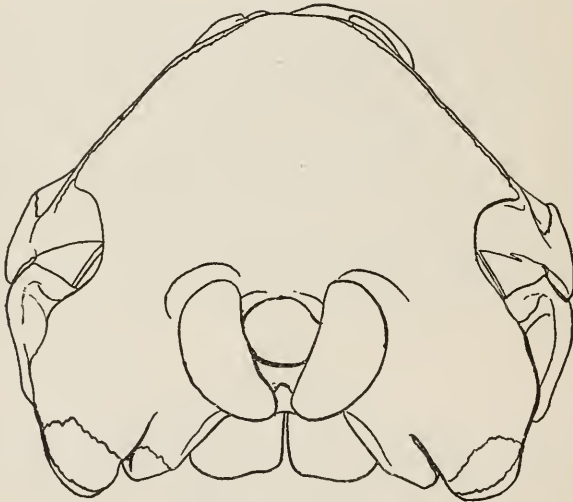


FIG. 1.—POSTERIOR ASPECT OF SKULL.

External angle of the exoccipital, which articulates with the zygomatic, truncated. Zygomatic processes large, thick, and truncated both anteriorly and posteriorly. The postglenoid process large and strongly projecting. Orbit large, with the superior border slightly convex. Free margin of the lachrymal nearly one-half as long as the orbit. Maxillary prominences high and angular, appearing as if truncated anteriorly. Lateral free border of rostrum curved upward at the proximal end.

Pterygoids large and strongly projecting outward and downward. The posterior notch longer and narrower than in *M. europæus*. Inferior outline of the rostrum straight, continuous at the base with that of the pterygoids. In *M. europæus* the inferior outline is convex and cut off at the base by that of the pterygoids, which meets it at an angle.

*Inferior aspect.*—Wings of the basisphenoid very thick. Posterior end of vomer terminating in an irregular angular projection, notched in the median line. Lateral portion of the pterygoids very wide; median portion narrow with the external borders concave and the inferior surface convex and devoid of the oblique ridge seen in *M. europæus*; the anterior convex extremity broad. Palatines almost concealed anteriorly by the pterygoids, but appearing on the median side of the latter as a narrow triangular area with the apex directed backward. External to the pterygoids the palatines occupy an elongated pyriform area, as in *M. europæus*.

The maxillaries extend backward along the median line so far that they prevent the palatines from meeting as they do in *M. europæus*. Only a very small area of the vomer is visible between the closely approximated pterygoids. Anterior expanded end of malar bone large and nearly as broad as long. It extends into and occupies the base of the anteorbital notch. Lachrymal with a broad truncated free margin; irregularly strap-shaped proximally and overlapped by a broad posterior extension of the maxillary bone. Its anterior free margin forms the outer half of the external boundary of the anteorbital notch.

Beak slightly and evenly convex at the base. The vomer appears as an elongated, fusiform ridge in the middle of the beak, the length of the visible portion more than one-third the length of the beak. Anterior to it the premaxillæ are convex along the median line and concave on either side, thus forming two long, moderately deep grooves. At the apex of the jaw the premaxillæ diverge from the median line and are not in contact.

#### MANDIBLE.

Plate 57, fig. 1.

The mandible is thick and heavy. Viewed from the side, the inferior border is concave at the middle and convex at either end. The symphysis is strongly bent upward. The angle is broad and rounded and projects backward much beyond the condyle. The coronoid process is very obtuse and is not separated from the condyle by an emargination. Anterior to it the superior border of the ramus is very convex, while it is concave opposite the posterior end of the symphysis.

The symphysis occupies one-fourth the length of the jaw. The upper surface is flat, but the two halves are inclined toward the median line. It is rounded anteriorly.

#### TEETH.

Plate 57, fig. 2.

The two mandibular teeth are remarkable for their small size, anterior position, and strong forward inclination. They were entirely

concealed by the integuments and their position could not be definitely determined until the latter were removed. The distance from the alveolus of each tooth to the apex of the jaw, obliquely, is 12 mm.; from the alveolus to the median line, 7 mm. As already mentioned, the teeth are inclined forward at an angle of 45° and also slightly outward. They project 4 mm. above the upper margin of the jaw.

The teeth are fusiform and slightly curved, and compressed. Their length is about 30 mm. and their greatest diameter about 9 mm. The tips are very acute and appear to be devoid of enamel.<sup>1</sup>

*Dimensions of the type-skull of Mesoplodon mirum, Cat. No. 175019, U.S.N.M.*

	<i>mm.</i>
Total length.....	810
Length of rostrum.....	496
Length from tip of rostrum to posterior end of pterygoids in median line.....	618
Greatest height from vertex to inferior border of pterygoids.....	301
Breadth across centers of orbits.....	325
Breadth between zygomatic processes.....	345
Breadth between bases of anteorbital notches.....	210
Breadth at middle of beak.....	60
Breadth across occipital condyles.....	125
Breadth of expanded proximal ends of premaxillæ behind anterior nares.....	142
Least breadth of premaxillæ opposite anterior nares.....	118
Breadth of premaxillæ opposite premaxillary foramina.....	68
Greatest breadth of anterior nares.....	56
Least distance between maxillary foramina.....	92
Distance from posterior border of maxillary foramen to end of maxillary protuberance.....	63
Length of portion of vomer visible on palate.....	162
Length of mandible.....	668
Length of symphysis.....	193
Greatest height of mandible opposite coronoid process.....	117

The skull of *Mesoplodon mirum* presents a close general resemblance to that of *M. europæus*, except in the position of the teeth. The species belongs to that section of the genus which is characterized by the absence of the basirostral groove, and comprises the species *mirum*, *bidens*, *europæus*, *hectori*, and *stejnegeri*. From *bidens* the present species differs in possessing a shorter and broader rostrum, more closely approximated premaxillæ, more prominent maxillary ridges and deeper anteorbital notch, broader maxillary frontal plates, a smaller anterior projection of the palatines, larger temporal fossæ, differently shaped lachrymal and pterygoid bones, and many other characters.

From *europæus* it differs in the form of the rostrum, lachrymal and pterygoid bones, and other characters as indicated in the foregoing description.

<sup>1</sup> The teeth have been fixed in their natural position in the jaw, and it seems undesirable to extract them. On that account it is not possible to give exact dimensions.

From *hectori* it differs in the greater breadth of the cranium, the size and shape of the maxillary ridges and anteorbital notches, the concavity of the superior margin of the temporal fossæ, the much shorter vertex, etc. It bears no close resemblance to *stejnegeri*.

The shape of the mandible is similar to that of the last-named species, but the symphysis is somewhat longer, and the position and size and form of the teeth are entirely different. *M. hectori* is the only known species besides *mirum* that has the teeth at the extremity of the mandible, but the skull of the former, as already remarked, presents quite different characters from that of *mirum*.

#### EXPLANATION OF PLATES.

*Mesoplodon mirum* True. Type-specimen, Cat. No. 175019, U.S.N.M., Beaufort Harbor, North Carolina. Adult female, 16 feet long.

##### PLATE 52.

The type-specimen lying in Beaufort Harbor. Head dissevered and fins somewhat mutilated.

##### PLATE 53.

Fig. 1. Head, superior aspect.

2. Head, lateral aspect.

3. Head, inferior aspect. About  $\frac{2}{3}$  natural size.

##### PLATE 54.

Skull, superior aspect. About one-fifth natural size.

##### PLATE 55.

Skull, inferior aspect. About one-fifth natural size.

##### PLATE 56.

Skull, lateral aspect. About one-fifth natural size.

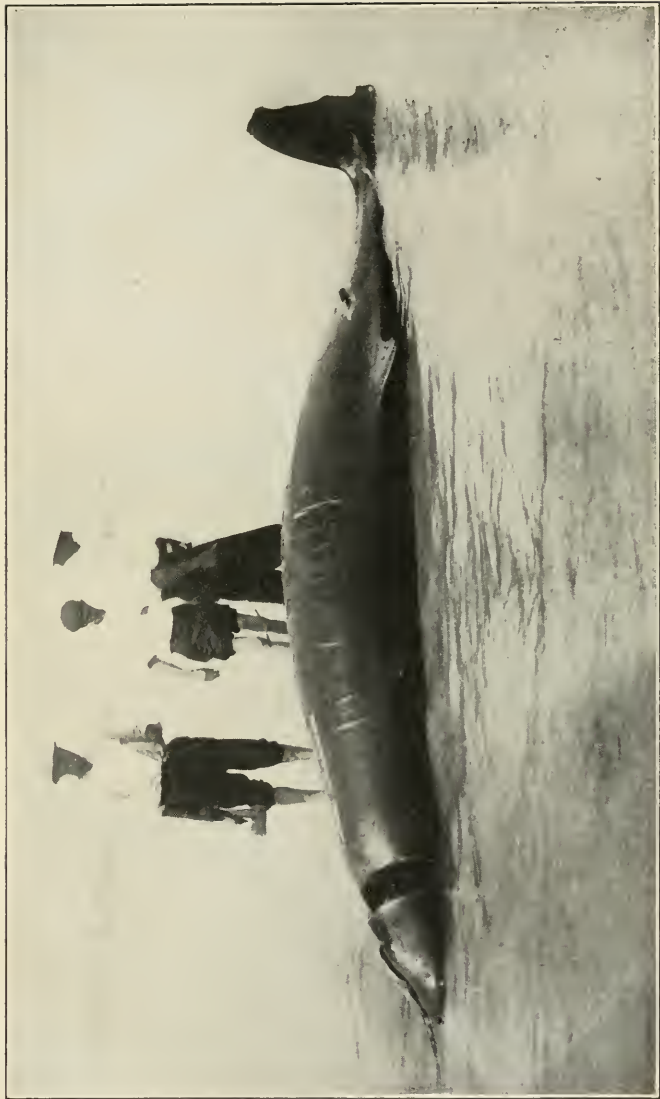
##### PLATE 57.

Fig. 1. Mandible, left side. About one-fourth natural size.

2. Symphysis of mandible, showing the teeth in position. About seven-tenths natural size.







BEAKED WHALE, *MESOPLODON MIRUM*.

FOR EXPLANATION OF PLATE SEE PAGE 657.



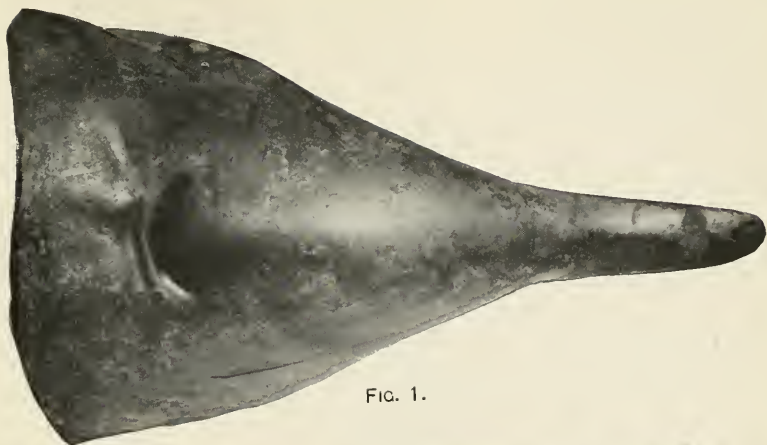


FIG. 1.

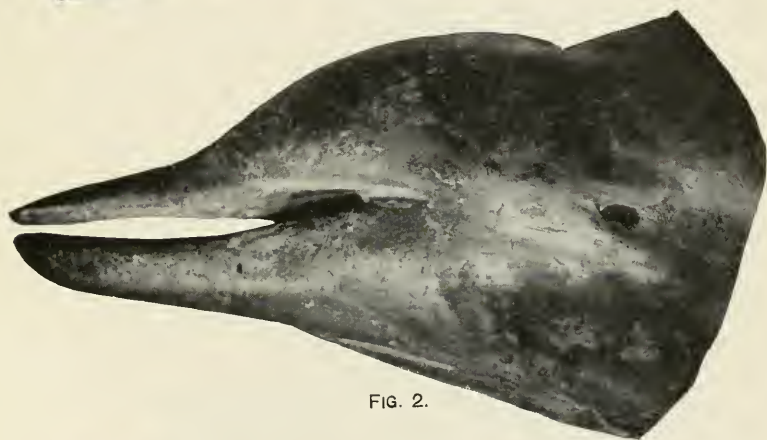


FIG. 2.

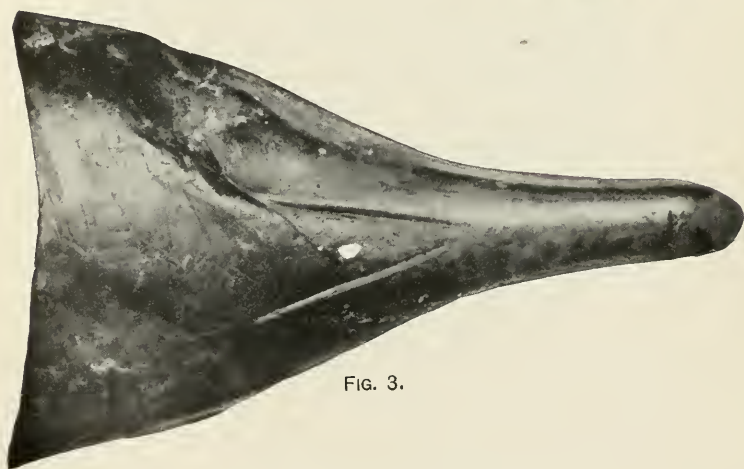
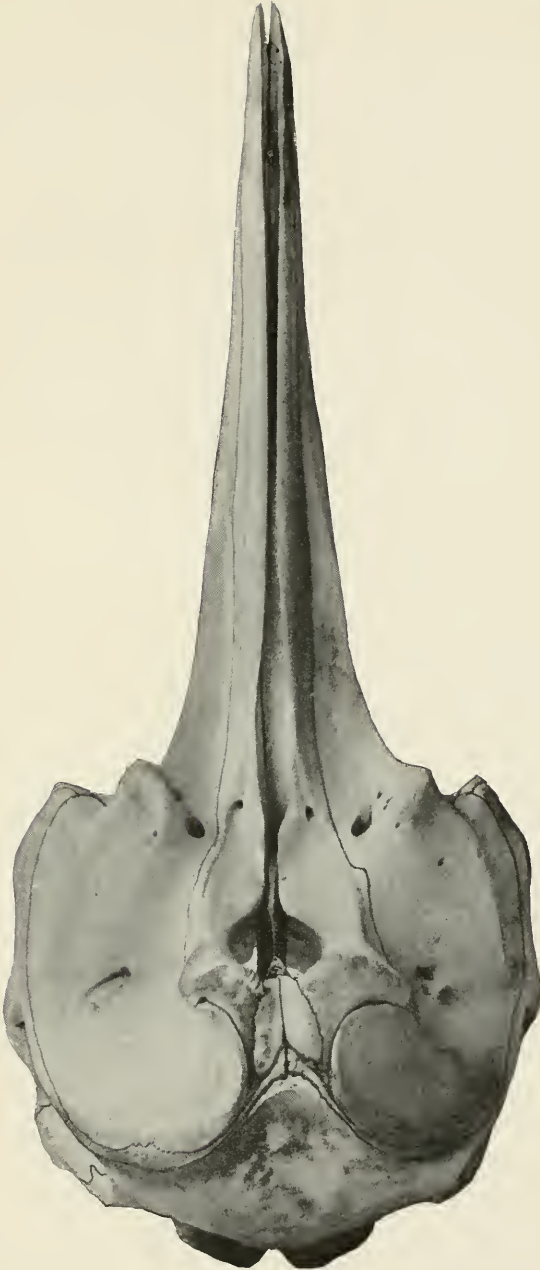


FIG. 3.

VIEWS OF HEAD OF BEAKED WHALE.

FOR EXPLANATION OF PLATE SEE PAGE 657.





SUPERIOR VIEW OF SKULL OF BEAKED WHALE.

FOR EXPLANATION OF PLATE SEE PAGE 657.





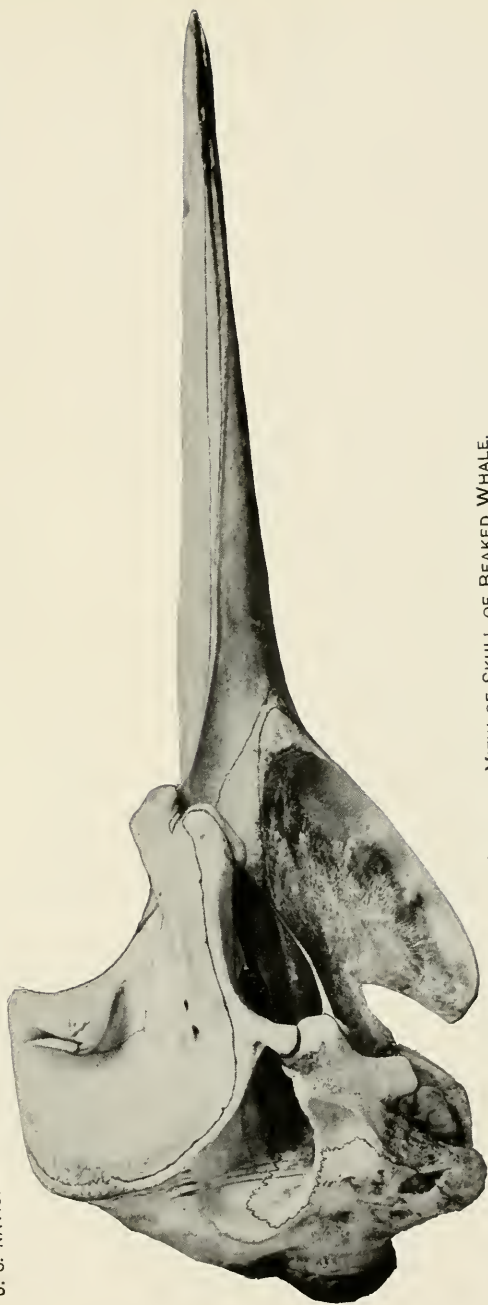
INFERIOR VIEW OF SKULL OF BEAKED WHALE.

FOR EXPLANATION OF PLATE SEE PAGE 657.





U. S. NATIONAL MUSEUM



LATERAL VIEW OF SKULL OF BEAKED WHALE.

FOR EXPLANATION OF PLATE SEE PAGE 657.



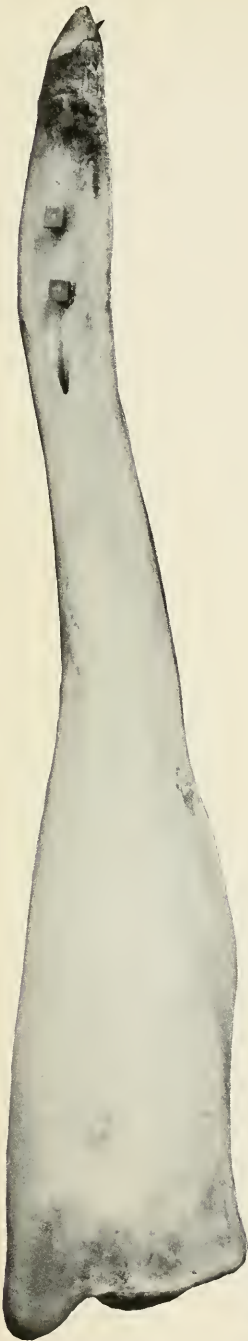


FIG. 1.



FIG. 2.

VIEWS OF MANDIBLE OF BEAKED WHALE.

FOR EXPLANATION OF PLATE SEE PAGE 657.