



## XLVI.—Notes on a specimen of Sowerby's Whale (Mesoplodon bidens), stranded on the Norfolk Coast

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## PLATE XIV.

- Fig. 4. Diagram of a transverse section passing along a radial canal on the right hand side but not on the left.  
 Fig. 5. A radial section cut a little to one side of the opening of a radial canal into the ring-canal,  $\times 60$ .  
 Fig. 6. A portion of a tentacle, showing the arrangement of thread-cells.  
 Fig. 7. A tangential section through two adjacent marginal sense-organs.  
 Fig. 8. A marginal body seen in longitudinal optical section.

c.c. Circular canal.  
 ect. Ectoderm.  
 e.l. Endoderm lamella.  
 end. Endoderm.  
 gem. Medusa buds.  
 IR. Interradial tentacle.  
 mn. Manubrium.

ms. Mesogloea.  
 m.v. Muscles of velum.  
 R. Radial tentacle.  
 r.c. Radial canal.  
 s. Marginal sense-organ.  
 te. Tentacle.  
 v. Velum.

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XLVI.—Notes on a Specimen of Sowerby's Whale (*Mesoplodon bidens*\*), stranded on the Norfolk Coast. By T. SOUTHWELL, F.Z.S., and SIDNEY F. HARMER, M.A., F.Z.S.

[Plate XV.]

ON the 19th December, 1892, we received intimation that a "large fish" accompanied by a young one had come ashore on the previous day at Overstrand, near Cromer, and on the following day we visited Overstrand together with the expectation of seeing one of the commoner species of Cetacea, but were agreeably surprised to find that the animal which had been stranded was a fine adult female specimen, 16 feet 2 inches in length, of Sowerby's Whale. It had been discovered on the morning of the 18th December left in shallow water by the receding tide, still alive but feeble, and, after being anchored to the shore for security, had been placed on a trolley and carried to the top of the cliff; it died, however, before it was taken from the water. Previously to our arrival on the scene it had been eviscerated, and was lying in a shed on the top of the cliff, a foetus, 5 feet 2 inches long, having been extracted from it.

\* Professor Sir W. Turner, in a recent paper on its occurrence in the Firth of Forth, has adopted the generic name *Micropteron* for this animal, as proposed by A. Wagner in 1846, and used by Eschricht and G. Cuvier; but for the reasons assigned by Professor Sir W. Flower, in a footnote to his paper on the "Recent Ziphioid Whales" (Tr. Z. S. viii. p. 208), we prefer to retain the more familiar term *Mesoplodon*, as applied by M. P. Gervais in 1850.

We are informed that both mother and young are being stuffed and the skeleton of the former mounted for the Hon. Walter Rothschild, for whom they were purchased, being intended for his museum.

Eighteen examples of this species have been previously recorded, all from the North Atlantic, but in only one previous instance has it been met with in England, namely at Spurn Point in 1885\*, and with five exceptions all have been males; nor has any perfect specimen in a fresh condition ever been fully described, unless, indeed, the young female taken at Atlantic City in March 1889 should prove an exception; but of this we have at present received no particulars. We were therefore glad of an opportunity of examining so good a specimen under comparatively favourable, although not altogether satisfactory, circumstances, for the animal was unfortunately lying in such a position that it was impossible to obtain a photograph of it, and one side only could be seen. We regretted this the more as, although several figures of Sowerby's Whale have already been published, most of them are not completely satisfactory in all respects, and we should have been glad to have secured a good photograph; but the accompanying figure (Pl. XV.) has been carefully reconstructed from sketches and measurements made on the spot.

Of the original published figures the best with which we are acquainted is that of Reinhardt †, which is unfortunately contained in a journal not easy of access to English readers; other figures more or less satisfactory have been given by Sowerby ‡, Dumortier §, Andrews ||, &c., and a figure of a head has been recently published by Sir William Turner ¶ from a photograph which differs in several noteworthy particulars from the specimen examined by us, especially in the proportions of the rostrum and lower jaw. The coloration of the body also differs considerably in the various descriptions; but to these we shall have to refer later on, and will proceed to give the results of a careful examination of the specimen under consideration.

The two remarkable mandibular teeth so characteristic of the adult male of this species were not visible in our specimen,

\* Southwell and Eagle Clarke, *Ann. & Mag. Nat. Hist.*, Jan. 1886, p. 53.

† Oversigt over d. Kong. Danske Vid. Selskabs, Copenhagen, 1880.

‡ J. Sowerby, 'The British Miscellany,' 1804-1806, vol. i. pl. i.

§ B. C. Dumortier, "Mém. sur le *Delphinorhynque microptère*," *Nouv. Mém. de l'Acad. Roy. de Bruxelles*, xii., 1839.

|| W. Andrews, "On *Ziphius Sowerbyi*," *Trans. Roy. Irish Acad.* xxiv. 1871, pl. xxv.

¶ *Proc. Roy. Phys. Soc. Edinburgh*, x., 1888-89.

which was a female. The jaws were apparently completely edentulous, and although it was possible to feel through the gums a slight prominence on either side in the position of the teeth of the male, we could not by this means definitely satisfy ourselves with respect to this point, nor were we able to ascertain the presence of any other rudimentary teeth in either jaw. The evidence which exists on this subject is favourable to the view that the female of this species is not provided with any teeth which are large enough to pierce the gums. Both the rostrum and the lower jaw were distinctly longer and more slender than in Sir William Turner's specimen, in our comparisons with which the difference in sex and age must be borne in mind. The rostrum and lower jaw together were nearly cylindrical when the mouth was closely shut and both were evenly rounded at the tip, the lower jaw projecting about half an inch beyond the rostrum. The contour of the mouth also differed considerably from that of the specimen figured by Sir W. Turner—the mandible passed backwards in a nearly straight line for a considerable distance, the lower edge of the mouth then curving upwards and again downwards. The gape was small, the angle of the mouth being nearly 4 inches in front of the point of junction of the upper and lower lips, which, behind the angle of the mouth, bounded a groove continuing the direction of the mouth. Beneath the lower jaw were the two singular gular sulci characteristic of the members of the subfamily Ziphiinæ; these were expansible straight grooves in the skin  $11\frac{3}{4}$  inches long, converging at their anterior ends, which were only half an inch apart, and diverging to their posterior ends, which were separated by an interval of  $9\frac{1}{2}$  inches.

The eye was contained in a horizontal slit  $1\frac{1}{4}$  inch long, the iris being brown; the pupil, a long oval with its major axis horizontal, appeared to be black. It was situated at a distance of  $7\frac{1}{2}$  inches from the termination of the furrow formed by the mouth-slit and  $11\frac{1}{4}$  inches behind the actual angle of the mouth.

The aperture of the ear was very minute and not easy to discover in the adult specimen; a comparison with the fœtus, however, enabled us to convince ourselves that a minute aperture situated about 3 inches behind the eye in the adult specimen, and into which we were able to pass a fine bristle, was really the external auditory meatus. This aperture was distinctly below the level of the eye, as shown in Reinhardt's figure, and not in a line with it as in Sir W. Turner's \* figure.

\* *Loc. cit.*

The blow-hole was slightly in advance of the eye and was crescentic in shape, the horns of the crescent pointing forward. The major portion of the blow-hole was situated to the left of the medial line of the head, but we could not detect any other asymmetry in the arrangement of this aperture. In Sir W. Turner's specimen the right limb of the crescent was slightly in front of the left.

The head was very prominent dorsally for a short distance in front of the blow-hole.

The pectoral limb was relatively small and was situated at a low level on the animal, convex on both its borders and somewhat sharply pointed. A cutaneous groove passed forwards from its anterior end, continuing the line of its lower margin \*, the length of the lower border, measured along the curve from the anterior end of this groove, being 1 foot 9½ inches, whereas the length of the upper border (also measured along the curve) was 1 foot 5½ inches.

The dorsal fin was situated considerably behind the middle of the animal (not quite two thirds) and was strongly falcate behind; its base measured 1 foot 1¼ inches and its height was 7½ inches. The commencement of the fin was 10 feet 2 inches from the tip of the rostrum, and the posterior end of its base was 5 feet 11 inches from the middle of the border of the dorsal fin, both measurements following the curve of the back.

The greatest dorso-ventral diameter (3 feet 5 inches) was about midway between the pectoral and dorsal fins. The large size of the middle of the body, which tapered to much smaller dimensions at either end, was one of the most obvious of the external features of this specimen, and in this it agreed closely with the published accounts of other individuals; it must not, however, be forgotten that the Overstrand specimen was in a pregnant condition when captured.

The body became laterally compressed near the tail, and both the dorsal and ventral edge formed a conspicuous ridge or medial keel passing a short distance along either surface of the tail, which was entire on its posterior border, the place of the medial notch, as in *Hyperoodon*, being taken by a slight convexity, which in this specimen had, however, been somewhat abraded by the rope used in its capture. The flukes of the tail measured 3 feet 8 inches from tip to tip.

\* This could not be shown in fig. 1, in which what is apparently the insertion of the limb is really the termination of the cutaneous groove mentioned above.

*Coloration.*

Previous observers have described this animal as being lighter beneath than above. This was distinctly not the case in the specimen under consideration, which was of a uniform black colour (with the slight exceptions shortly to be mentioned), the skin being very smooth and polished, as has been described in other instances; and the fishermen in charge who had assisted in its capture informed us that at first there was a perceptible bluish tint on the skin in a good light. But the most remarkable feature was the presence of a number of curiously shaped marks sparsely distributed over the body, but most numerous on the side and ventral surface. These spots were most irregular in size and figure, some being annular, others mere blotches, others again having the appearance of splashes or smears varying in size up to that of a man's hand. One peculiar mark in the dorsal region consisted of several horizontal lines crossed by two others in a nearly vertical direction. These curious markings, which seem somewhat to resemble the markings on *Grampus griseus*, have been frequently referred to, and seem to differ considerably in different individuals; but certainly in this instance there was very little resemblance to the "vermicular streaks" described and figured by Sowerby \*, and with which he stated the sides of his specimen were "completely covered." We have not attempted to reproduce these markings in the accompanying figure.

The colour was not appreciably lighter on the belly than on the back; the anterior edges of the tail-flukes were grey, that colour shading off gradually into the general black hue of the rest of the tail. The lower jaw was grey in front, but became distinctly white near the posterior end of the slender part of the jaw, the white colour extending some distance backwards along the edge of the mouth; the upper jaw was greyish, its edges being white, the inside of the mouth black, and the small tongue, which was only free at the point, flesh-coloured.

The foetus (Pl. XV. fig. 2) had been removed from its membranes and the umbilical cord severed close to the body; it resembled the adult in its general characters, but of course was much less robust in appearance; the grooves of the throat were well developed and the fins were identical in position and form with those of the parent, the most noteworthy point of difference being the

\* Sowerby, 'British Miscellany,' pl. i.

relative shortness of the jaws as compared with the adult. The Ziphoid elongation of the beak had not yet been acquired, and no trace of teeth could be detected in either jaw.

The colour of the fœtus was black above and red below, the latter colour being due to the effusion of blood into the skin, which was doubtless white when the fœtus was removed from the uterus. Parts of the head, including a horizontal streak passing through the eye, were bluish grey, and the first two inches of both the upper and lower jaws were black.

*Table of Measurements.*

	ADULT.		FŒTUS.	
	feet.	in.	feet.	in.
Extreme length in straight line from tip of rostrum to middle of tail . . . . .	16	2	5	2
Girth of head round eminence in front of blow-hole . . . . .	2	8 $\frac{3}{4}$		
Girth in plane of blow-hole . . . . .	3	4		
Girth in plane 4 $\frac{1}{2}$ inches behind eye . . . .	4	5		
Transverse diameter of blow-hole . . . . .		4		
From tip of lower jaw to angle of mouth.	1	5 $\frac{1}{2}$	5 $\frac{1}{4}$	
"    "    "    "    posterior end of the groove running back from the angle of the mouth . . . . .	1	9 $\frac{1}{4}$	7	
From tip of upper jaw to angle of mouth.	1	5	5	
From eye-slit to angle of mouth . . . . .		11 $\frac{1}{4}$		
Antero-posterior diameter of eye-slit . . . .		1 $\frac{1}{4}$		
From eye-slit to vertical line passing through external auditory meatus . .		3		
From horizontal line produced back from eye-slit to external auditory meatus		2		
Greatest dorso-ventral diameter of the part of the head in front of the blow-hole . . . . .	1	3 $\frac{3}{4}$		
Length by which mandible projects beyond rostrum . . . . .		$\frac{1}{2}$		
Height of dorsal fin . . . . .		7 $\frac{1}{2}$	3 $\frac{1}{4}$	
Length of base of dorsal fin . . . . .	1	1 $\frac{3}{4}$	4 $\frac{1}{2}$	
From tip of upper jaw to front end of base of dorsal fin (measured along curve of back) . . . . .	10	2	3	3
From posterior end of base of dorsal fin to middle line of tail (measured along curve of back) . . . . .	5	11	1	8 $\frac{1}{2}$
From tip to tip of flukes (measured in a straight line) . . . . .	3	8		
Length of slits for mammæ . . . . .		2 $\frac{3}{4}$		
Length of lower border of pectoral fin (measured along curve from front end of groove extending forwards from base of fin) . . . . .	1	9 $\frac{1}{2}$	9	

	ADULT.		FŒTUS.
	feet.	in.	feet. in.
Length of upper border of pectoral fin (measured along curve).....	1	5½	8
Length of grooves beneath lower jaw ..		11¾	
Distance between front ends of the above grooves .....		½	
Distance between hind ends of the above grooves .....		9½	
Greatest dorso-ventral diameter (2 feet 8 inches in front of dorsal fin).....	3	5	

Of the general history of the Ziphioid whales Sir W. H. Flower has given an admirable summary in his paper "On the Recent Ziphioid Whales," which will be found published in the 'Transactions of the Zoological Society of London,' vol. viii. p. 203 (1871), and "A Further Contribution to the Knowledge of the existing Ziphioid Whales: Genus *Mesoplodon*," which appeared in the same publication, vol. x. p. 415, in 1877: and of the anatomy and, to some extent, of the external appearance Sir William Turner has contributed most valuable papers, which have appeared from time to time in the 'Journal of Anatomy and Physiology;' but unfortunately the specimens which came under the notice of this excellent anatomist have never been in such a condition as to enable him to give the exhaustive description of the exterior appearance of the animal which we should certainly have received had the material been at his disposal.

The same may be said to a greater or less degree of the continental naturalists, and Sowerby's type specimen described by him at second hand; the two Bandon specimens also were so mutilated as to be of little service to science. It thus happens that the skeleton and soft parts of this species are better known than its external appearance. This deficiency we have endeavoured, so far as the Overstrand example is concerned, to supply; but, as so many discrepancies are noticeable between our observations and those which have previously appeared, we venture to append some observations on the published descriptions and original figures of this singular animal. How far these discrepancies may be due to differences of age and sex we have not sufficient evidence to venture an opinion.

SOWERBY, JAMES. 'The British Miscellany,' 1804-1806, vol. i. pl. i. *Physeter bidens* ♂, Elginshire.—The figure in outline closely resembles the Overstrand specimen, the general shape of the body being almost identical, but the head is relatively shorter

and the lower jaw more massive, with of course two teeth, indicative of the male sex; the tail is shown with a mesial notch, and the conspicuous keels, both on the upper and lower surfaces of the termination of the body, are absent; the dorsal fin is much less falcate and the pectoral limbs longer, narrower, and less pointed than in the Overstrand specimen. The coloration, "black above, nearly white below," and the sides "completely covered with white vermicular streaks in every direction," differs materially from the specimen we had the opportunity of examining.

REINHARDT, J. "*Mesoplodon bidens*, en Tilvæxt til den danske Havfauna," Oversigt over d. K. D. Vid. Selskabs, 1880 (Kjöbenhavn), p. 63, tab. ii. (adult female, side view, and dorsal view of head and part of the body).—This appears to be a very good figure; the external auditory meatus is shown in much the same position as in the Overstrand specimen, but the contour of the head differs in having a deep depression at the base of the skull and in the body being less fusiform. The animal had been dead for over a month when Reinhardt examined it\*, and, except in a few places, nearly all the cuticle was removed, which may account for the auditory meatus being so conspicuous, probably also for the occipital depression already mentioned. The only reference to colour is the statement that the remains of the epidermis and the interior of the mouth were blackish. On the shrinking of the integuments two small functionless teeth about the size of a pin's head were seen on each side of the upper jaw, so loosely lodged that they were freely movable; a third could be felt on cutting into the skin, and, more posteriorly, apparently a fourth, but no trace of teeth could be found in the mandible, though the author suggests that they also were probably present in this specimen.

ANDREWS, W. "On *Ziphius Sowerbyi* (*Mesoplodon Sowerbiensis*, Van Beneden)," Trans. Roy. Irish Acad. xxiv., 1871 [read 8th April, 1867], p. 429, pl. xxv. figs. 1, 2, 3: 1, side view of frontal portion of head; 2, upper portion of head; 3, under portion, showing the throat-furrows; all from photographs. ♂.—Teeth very conspicuous and throat-furrows figured as uniting in front; irides said to have been blue.

DUMORTIER, B. C. "Mémoire sur le *Delphinorhynque microptère* échoué à Ostende," Nouv. Mém. de l'Acad. Roy. de Bruxelles," tome xii., 1839, pl. i., *Mesoplodon bidens* ♀, stranded at Ostend, Aug. 21, 1835.—The figure is on the whole good, but the following criticisms may be made. The shape is much the same as that of the Overstrand specimen, but the attachment of the caudal fin is not accurately drawn, and both the dorsal

\* We are indebted to Sir William Turner's paper in the 'Journal of Anatomy and Physiology,' 1882, p. 459, for a translation of the substance of Reinhardt's remarks.

and pectoral fins appear to be too large. The mouth is widely open, but no groove running backwards from its angle is shown. The length is stated to have been 3 metres 45 centim. (= 11 feet 4 inches), and the animal was kept alive out of the water for two days; it made a noise like a cow. The colour was "brunâtre plombée," except the ventral surface, which was "blanchâtre et cendré." Plate ii. shows skeleton, plate iii. hyoid and other details.

The first known example of this species was met with in the year 1800; after twenty-five years two others were procured in France; an interval of ten years elapsed (1835) before the next specimen was obtained on the Belgian coast at Ostend; nothing more was heard of the species till 1864, in which year, also in each of the years 1866, 1867, 1869, 1870, and 1872, a single individual was procured; the next example was obtained in 1880; 1881 produced two, 1885 three, 1888 one, 1889 one, and 1892 one—nineteen examples in all. Of seventeen instances in which the sex was known or believed to be known eleven were males and six females; we mention this preponderance of males as being the reverse of what occurs with regard to the nearly allied *Hyperoodon*, the adult male of which has never been met with on our coast, although large numbers of both sexes congregate in summer in the seas between Iceland and Jan Mayen and the females are regular spring and autumn visitors in the North Sea on their way to and from their summer habitat; but the line of migration of the males appears to be different to that followed by the females.

Again, with regard to the seasons at which it has been met with, Sowerby's Whale displays none of the regularity which marks the movements of the *Hyperoodon*; an analysis of the dates shows that it has been met with in February once, March twice, April once, May twice, June once, "summer" once, August twice, September twice, October twice, and December once, the bulk having been stranded on the shores of the North Sea and of the English Channel, and on the southwest coast of Ireland; *i. e.* from the Shetland Isles to the north of France. It may be that the February and December examples were belated wanderers which had lost their way; but the occurrence of so many examples between the months of March and October would seem to indicate that the waters of the North Sea represent the extreme northern boundary of the wanderings of this species; their southern habitat is quite unknown, except that two have been met with on the western side of the North Atlantic, at Nantucket Island

and Atlantic City, the latter in the month of March. Judging from the hopeless way in which it becomes entangled in the sandbanks and shoals of a shallow coast, it would seem to be unaccustomed to such impediments, and is probably a deep-water species. It is also worthy of note that the Overstrand *Mesoplodon* was within a short time of giving birth to a young one, whereas the young of the *Hyperoodon* are produced in the months of May and June.

Notwithstanding the very great advance which has been made in our knowledge of the Cetacea of late years, we are still very ignorant with regard to the habits and distribution of many species, and it is most desirable to place on record every circumstance which may tend, even indirectly, to throw light on a subject of so much interest.

#### EXPLANATION OF PLATE XV.

Fig. 1. *Mesoplodon bidens*, ♀, seen from the left side. Scale 1 : 40. The arrow *a* indicates the position of the blow-hole; *b*, gular sulcus; *c*, eye; *d*, external auditory meatus.

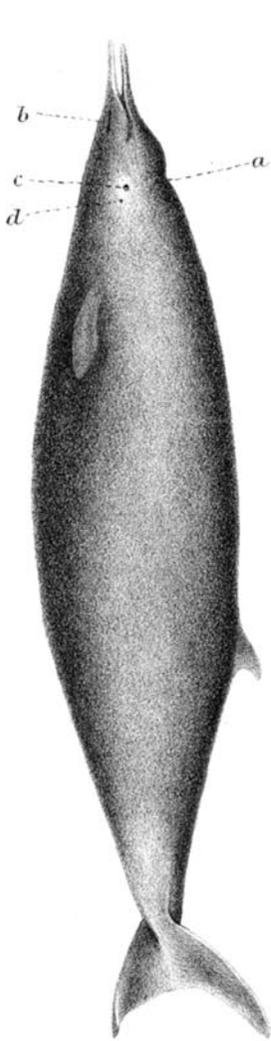
Fig. 2. Fœtus which belonged to the above specimen, seen from the left and slightly from the ventral side. From a photograph taken by Mr. W. D. Harmer. Scale 1 : 12. *b* and *c* as above; *e*, right pectoral limb.

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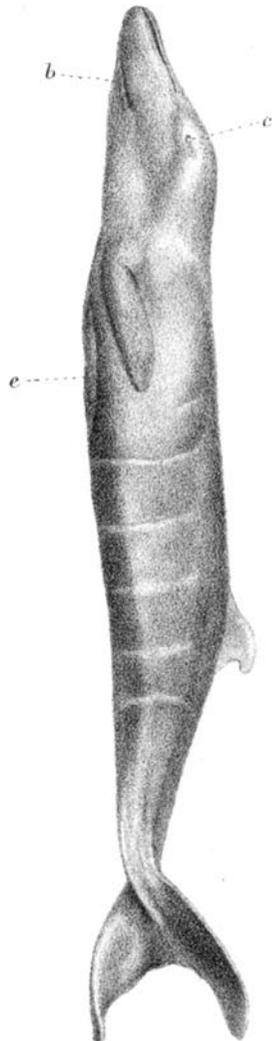
#### XLVII.—Note on the Genera *Geothauma* and *Gyrostropha*. By EDGAR A. SMITH.

THE genus *Geothauma* has recently been proposed by M. Crosse\* for the reception of that most wonderful little shell described by Lieut.-Col. Godwin-Austen under the name of *Opisthostoma grandispinosum*. M. Crosse considers the trochoid form, the spinous ornamentation, and the manner in which the last whorl is produced upward to the top of the spire of sufficient importance to distinguish it generically from the typical species of *Opisthostoma* from India. Many of the characters given in the diagnosis of the genus are specific rather than generic. This may have arisen from the fact that M. Crosse appears to have had but a single species in view at the time. At all events, it is unsatisfactory that he has not expressed his views regarding the other known species of *Opisthostoma* from Borneo, namely *O. de Crespigny*, H. Adams, *O. Wallacei*, Ancey, and *O. pulchellum* and

\* Journ. de Conch. 1892, p. 282.



1.



2.