

FOURTH CONTRIBUTION TO THE HISTORY OF THE EXISTING CETACEA.

BY E. D. COPE.

Grampus griseus, Cuvier. Pl. III.

A specimen apparently belonging to this species was taken by the United States Commission of Fisheries off the coast of Massachusetts. Its appearance may be learned from the accompanying plate, which is copied from a drawing made on the spot by the artist of the Commission. Its length is five feet five inches; the length of the pectoral fin, measured along its median line, is nine inches.

Globicephalus brachypterus, sp. nov.

Globicephalus? sp. nov., Cope, Proceedings Academy Philadelphia, 1866, p. 8.

A female of this genus was taken by fishermen, in February of the present year, on the east coast of Delaware Bay, at the mouth of Maurice River, and was sent to this city, where it fell under my observation. Its uninjured condition offered an opportunity of making a description of its external proportions and appearance. This had been a desideratum, since the examination of a cranium several years ago had led me to suspect that the black-fish of the middle and southern Atlantic coasts of the United States is a different species from the *Globicephalus melas* of the northern coasts of both continents.

The measurements of this specimen are as follows:—

	Feet.	In.
Total length, measured along the side	12	6.5
Length to base of dorsal fin		37
Length of base of dorsal fin		24
Elevation of the dorsal fin		9
Length of the pectoral fin		25.5
Greatest width of pectoral fin		7
Width of thorax between pectoral fins		18
Depth at middle of dorsal fin		35
Length from vent to end of tail (on convexity)		52
Depth of caudal peduncle half way between anus and end of tail		22
Expanse of flukes		43

The color is a uniform black, without any markings whatever.

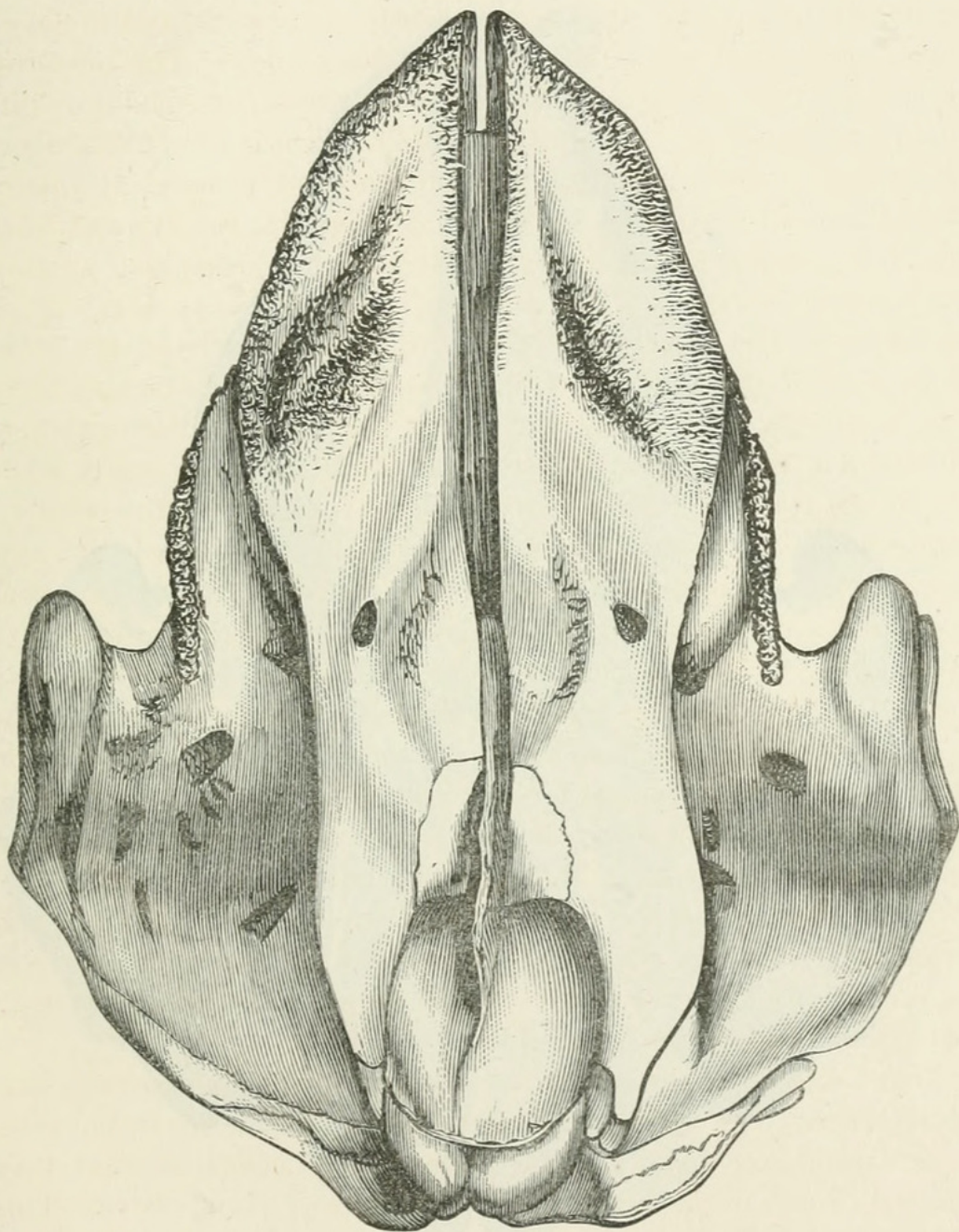
The profile of the head has the protuberant convexity of the other *Globicephali*, with a very narrow projecting lip. The general form of the body is elongate, more so than in the *G. melas*; and the dorsal fin has a more anterior position. Instead of standing near the middle of the length, it rises at the end of the anterior fourth of the length. Its base is unusually long, and its elevation not great. Its superior border is convex, and the apex decurved behind so as to be slightly descending. The posterior or caudal part of the body is much compressed, and maintains its depth with a very gradual diminution until near the flukes, where it contracts more rapidly. The blow-hole is situated at a point less than half way between the points opposite the eye and front base of pectoral fin; it forms a fissure, which presents a shallow concavity forwards. The anterior base of the pectoral fin is situated at the anterior third of the distance between the blow-hole and the front border of the dorsal fin. It is characterized by its relatively small size, and offers one of the distinguishing features of the species. It enters the total length six times, while in the *G. melas*, according to Van Beneden, it enters the total 4.5 times in a fully grown fœtus, and the length increases with age, according to Flower, so that its proper length would be about one-fourth of the total. This measurement nearly agrees with that given by Dr. Jackson, as obtained by him from a specimen from the New England coast, which I suppose to belong to the *G. melas*. In a specimen taken by the U. S. Fish Commission, the length of the pectoral fin is nearly as in the *G. brachypterus*. This probably represents the *G. intermedius*, Harl., and has a white abdominal band, and light gular areas.

The teeth in the specimen from Maurice River are small, and number five in the upper jaw and six in the lower. There is a mammary fissure on one side of the vulva, and a fissure with an additional fold on the other side.

The skeleton of this specimen presents several interesting characteristics. The cranium differs from that of *G. melas* in the anterior lateral expansion of the premaxillary bones, so that they entirely conceal the maxillaries when viewed from above. This character is not seen in numerous specimens of the *G. melas* from Cape Cod. The front teeth are less firmly implanted in alveoli than those of the *G. melas*; thus on one side of the maxillary bone, four alveoli are filled with osseous deposit; and on the

other side, one. The cervical vertebræ are all coössified, and they present no parapophyses, and but one diapophysis on each side (the seventh). Three segments of the sternum are preserved, which are longer than broad, the anterior two coössified. The first

Fig. 1.

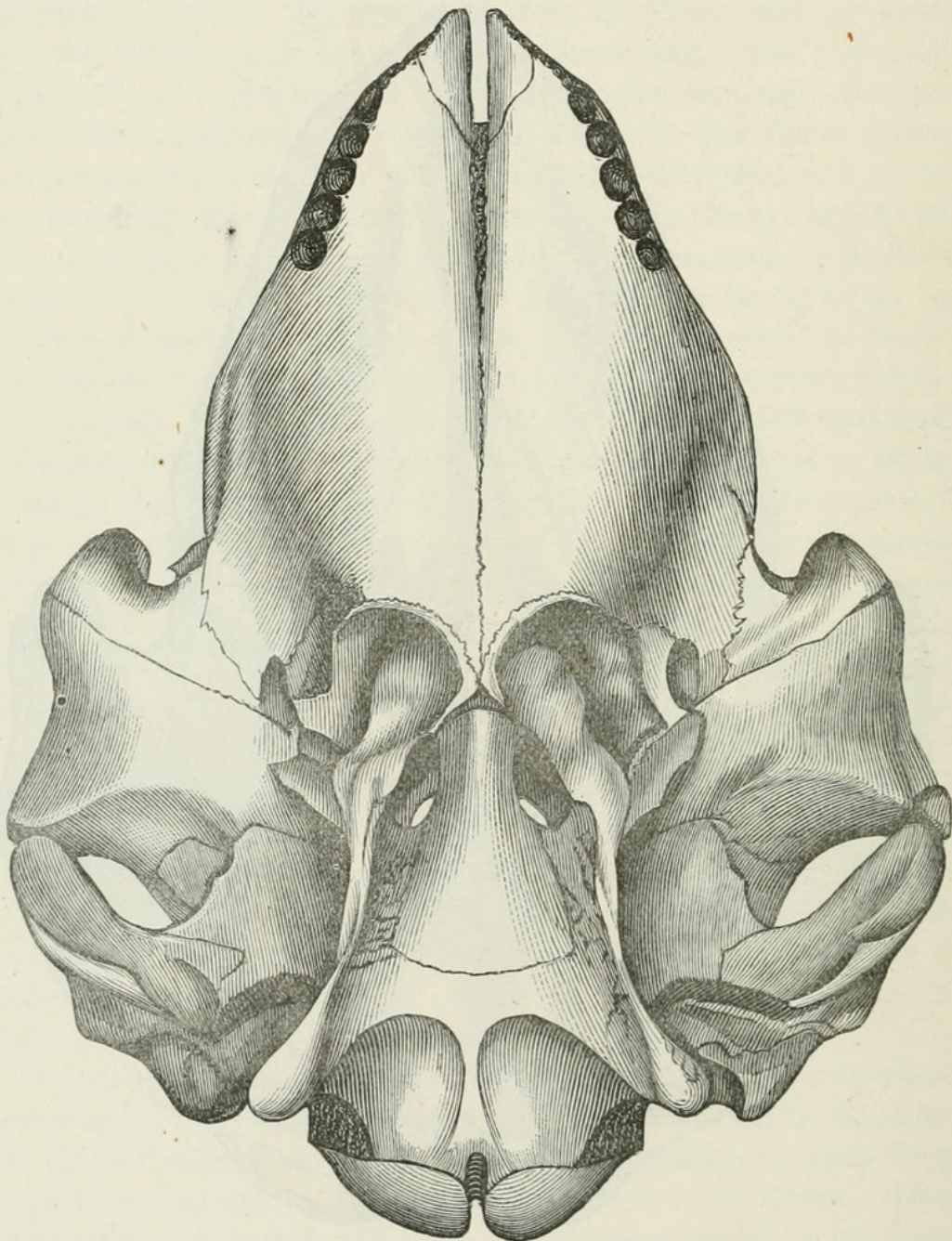


one is furnished with recurved antero-lateral processes, and is divided in front by an oval foramen. The scapula is as wide as high; it presents a rather long, truncate, coracoid process, and a

prominence of the proximal part of the spine, which represents the acromion.

The cranium which I formerly described (Proceedings Academy Philada., 1866, p. 8) is that of an adult of full size. I remarked

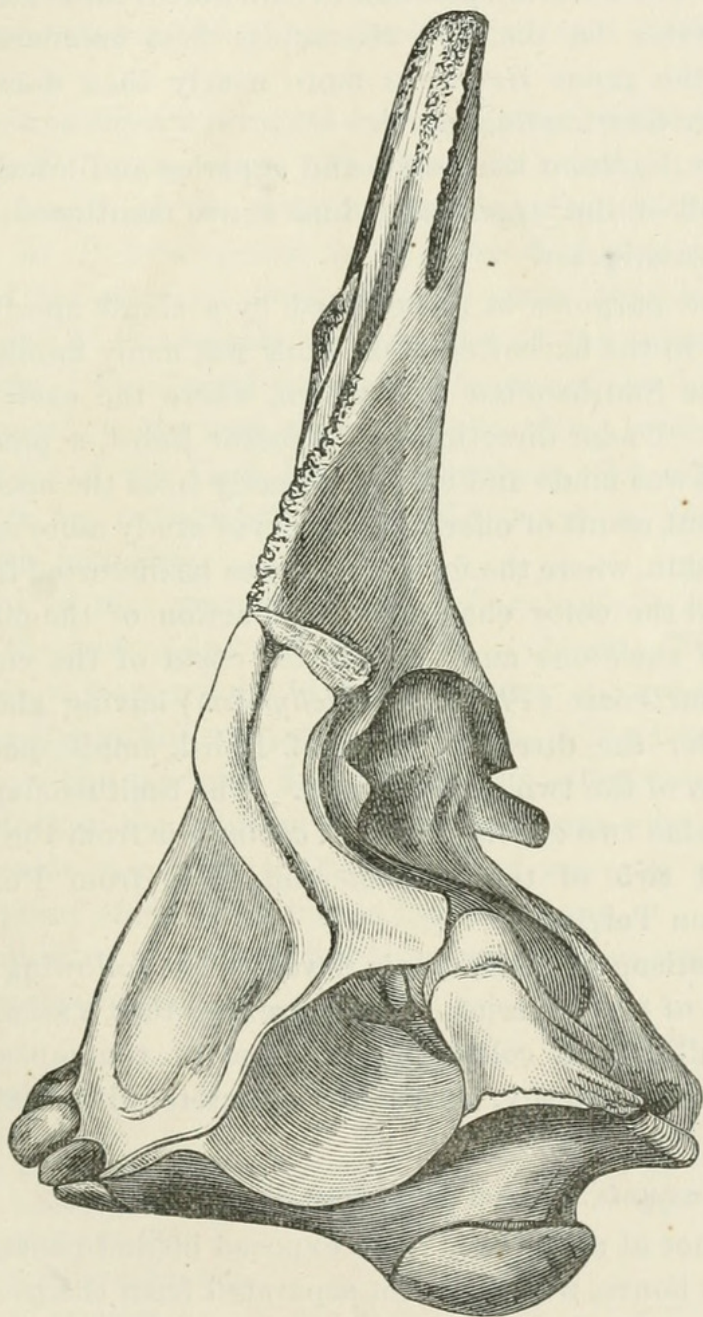
Fig. 2.



at that time that it differed from the crania of the *G. melas* from the European and New England coasts in the greater width of the premaxillary bones, which extend to the lateral borders of

the basal two-fifths of the maxillaries; and also in the small number of maxillary teeth, there being only five alveoli in the upper jaw. The existence of the same number of teeth in the

Fig. 3.



specimen now described proves that this small number in the adult is not due to shedding, or connected with age, and it is probably a constant character of this species. In the *G. melas*

there are ten teeth in the maxillary bone, as I have observed on numerous specimens from the New England coast.

In review, the *Globicephalus brachypterus* is characterized by the short pectoral fins, the few teeth, the wide premaxillary bones, and the absence of white band along the median line of the lower surfaces. The anterior position of the dorsal fin is also probably characteristic. In the two characters first enumerated, it approaches the genus *Grampus* more nearly than does any other well-known *Globicephalus*.

The cuts represent the profile and superior and inferior surfaces of the skull of the larger individual above mentioned.

Phocæna lineata, sp. nov.

This new porpoise is represented by a single specimen, which was taken in the harbor of New York not many months ago, and sent to the Smithsonian Institution, where the skeleton is now preserved. Under direction of Professor Baird, a plaster cast of the animal was made and colored directly from the specimen, with the excellent result of offering a means of study more reliable than the dried skin, where the form is likely to be distorted from various causes, and the color changed by the action of the oil. A large number of skeletons and two plaster casts of the common porpoise of our coast (*Phocæna brachycium*) having also been prepared under the direction of Prof. Baird, ample means for the comparison of the two species exist. The Smithsonian collection embraces also two crania of the *P. communis* from the Norwegian coast, and two of the *P. vomerina*, Gill, from Puget Sound, Washington Territory.

A comparison of these crania develops the following distinctive characters of three species. I may premise that a second cranium in the Smithsonian collection, and one in the museum of the Philadelphia Academy, agree in characters with that of the *P. lineata*.

Phocæna communis, Brookes (Nos. 3507-8).

Vomer not at all or very little exposed behind posterior border of palatine bones, which are not separated from the pterygoids by deep entrant notches.

Phocæna brachycium, Cope (*P. americana*, Agass., fide Verrill; not described), Proceed. Acad. Philada., 1865, p. 279.

Vomer with a narrow transverse protuberance behind the palatines, which are separated from the pterygoids by a deep notch.

Phocæna lineata, Cope, sp. nov.

Vomer with an extensive development behind the posterior margin of the palatine bones, forming an inverted table; the pterygo-vomerine outline forming an M.

The skull of the *P. vomerina*, Gill, differs in no appreciable degree from that of *P. brachycium*, and it remains to ascertain in what respect other parts of its structure present distinctive characters.

The *Phocæna lineata* presents various features which distinguish it from the *P. brachycium*. The body is relatively larger and longer, the length of the cranium entering the total six times; while that of *P. brachycium* is only one-fifth the total length. The base of the pectoral fin is situated more than half way between the end of the muzzle and the line of the anterior base of the dorsal fin. The dorsal region and border of the dorsal fin are entirely smooth, in the cast as in life, according to my friend, G. Brown Goode, of the U. S. Fish Commission, who examined the skin. There are twenty-four teeth of the typical form in each ramus of the mandible.

The color of this porpoise is quite characteristic. The upper surface to the middle line of each side is black. This color is bounded below from a point behind and below the eye to a foot in front of the end of the tail by a rosy-brown. The lower surfaces are whitish. The pectoral fin is black, the color being isolated from the black of the sides by the white and rosy colors described. Its black color is continued forwards and upwards as a narrow band to a point about three inches below the eye.

In the following measurements some comparisons are made with the *P. brachycium*.

	Inches <i>P. brachycium.</i>	Inches. <i>P. lineata.</i>
Total length	47	68
Length of skull	9.3	11
Length to base of dorsal fin	21	30
Length to posterior base pectoral	12	17
Width of skull at notch		3
Width of skull above orbits		5.6
Elevation of cranium		5
Length of head to below blow-hole		6
Length of head to eye (inclusive)		7.6
Length of posterior edge of pectoral fin		6.6
Elevation of dorsal fin		4

In further comparison with the *P. brachycium* I may add, that the casts preserved in the Smithsonian collection show that the colors of that species are widely different from those of *P. lineata*. They are black above, and the belly has a narrow yellow longitudinal band, which fades into a lead-color on the sides which commences at the axilla, and is marked with numerous brown spots. The sides of the throat are black, and this color continues posteriorly and involves the entire pectoral fin and parts immediately above it on the side. This specimen with numerous crania is from Eastport, Maine.

This, or a nearly allied species, is stated by F. Cuvier (Cetacea, p. 171) to be found on the European coast. The relative length of the head to the body is as in *Phocæna lineata*, and his fig. 1, pl. xii., represents a coloration nearly similar to the individual from New York Harbor. He does not distinguish it from the *P. communis*, although it differs entirely from the descriptions of that species.

Lagenorhynchus perspicillatus, sp. nov.

This species is represented in the collections of the Smithsonian Institution by numerous crania, some skeletons and a colored cast of the natural size, taken by the United States Commission of Fisheries, near Portland, Maine. Professor Baird, Chief of the Commission, states, that it is an abundant cetacean, and the fact that it has been hitherto unrecorded is doubtless due to the absence of facilities for obtaining these creatures, within reach of naturalists.

The species belongs to the *Delphinidæ* without palatal grooves (*Lagenorhynchus*, Gray), and to the section with flat muzzle of the cranium, and short beak of the integuments of the head.

The muzzle is longer than the brain case, measured internally, and a little longer than the cranium posterior to the maxillary notch. The occiput is convex, and the basal premaxillary triangle is an oblique plane a little elevated above the maxillaries at the sides. The anterior part of the triangle is rugose, and extends to the end of the basal fifth of the muzzle, measuring from the notch. In this portion the muzzle is flat with slightly recurved edges; in the remaining part, the section is depressed roof-shaped. Teeth $\frac{30}{30}$ acute, curved, directed outwards, and of medium size. The palate between the pterygoid bones is concave. The last tooth reaches to within an inch of the fundus of maxillary notch, and at

that point the sides of the palate slope obliquely upwards and outwards. The measurements of the cranium are as follows:—

	Inches.	Lines.
Total length	16	
Length of brain case (internal)	4	6
Length of muzzle to notch	8	9
Length to blow-hole	11	
Width of muzzle at notch	4	6
Width of cranium above orbits	8	2
Width of muzzle at distal fourth	2	3
Length of a tooth beyond alveolus		5

The general outline of this species is fusiform. The beak is well marked, and separated from the front by a groove. The front does not rise abruptly, but slopes gently backwards in continuation of the dorsal line. The dorsal fin is higher than long, and its apex is not decurved. The caudal peduncle is compressed and descends rather abruptly to the flukes. The typical specimen is about six feet in length.

The dorsal region is black to a line which begins in front of the eye, extends along the sides above their middle, and descending includes the entire caudal fluke. From the latter it sends forwards a narrow horizontal bar to a point half way to the dorsal fin, and which does not reach the abdomen. In front the black includes the entire upper lip, and sends posteriorly a short bar which includes the eye. The edge of the lower lip and the pectoral fin, with a line from the latter nearly to the former, are also black. The sides are a lead color as far as a line which leaves the lower-lip border at the middle, extends above the pectoral fin, descending by a Z-shaped border below the posterior edge of the dorsal fin, and extends to the black longitudinal bar of the caudal peduncle. Below this the surface is white.

The typical specimen is six feet in length.

This dolphin is, according to the descriptions, allied to the *L. acutus* of Gray (*D. eschrichtii*, Schleg.), especially in the characters of the cranium. The descriptions of the coloration of that species are quite different from that of the *L. perspicillatus*. A figure given by M. Poelman (Bulletin Acad. Royal Belgique, xvii. p. 608) represents the black longitudinal band of the caudal peduncle of *L. perspicillatus* to be extended forwards so as to unite with the black of the dorsal region on the side, thus inclosing above it a longitudinal white and pink area. The black

of the upper surfaces also involves the eye, which is, therefore, not surrounded by the spectacle-like mark of the *L. perspicillatus*. Other material differences in the coloration are also apparent. The colors of the *L. leucopleurus* are more like those of the present animal; but here also the black line of the side extends far forwards, and there is a short black line through the eye instead of the spectacle-like figure. The measurements of the skull differ from those of this species, and agree with those of the *L. acutus*, as given by Dr. Gray. (See Annals and Magaz. Nat. Hist., 1864, 133, pl. 3.)

Lagenorhynchus gubernator, sp. nov. Pl. IV.

This delphinoid was taken by the U. S. Fish Commission at near the same locality as the last. Two plaster casts were made and colored from the fresh specimens. These display differences from those of the *L. perspicillatus*, which are doubtless specific, although the two are nearly allied.

The typical specimens are about half the bulk of those of *L. perspicillatus*, measuring forty-seven inches in length. The muzzle is neither elongate nor very short, and is well marked off from the front, which rises more abruptly and is more convex than in the larger animal. The dorsal fin is longer than high, and the anterior border becomes horizontal above, so that the apex is directed posteriorly. The post-dorsal region is strongly compressed, and maintains its width more nearly to the base of the flukes, making a more abrupt contraction than in *L. perspicillatus*.

The description of the coloration of the *L. perspicillatus* applies to that of *L. bombifrons* with the following important exceptions: The white of the belly extends upwards to the dorsal coloration, entirely excluding the lead color so prominent in the *L. perspicillatus*. The black bar, which extends forwards from the flukes, reaches to below the posterior base of the dorsal fin, and extends also to the belly at its base, neither of which characters is observed in *L. perspicillatus*.

The measurements of this species are as follows:—

	Inches.
Total length	47
Length to the eye	6
Length to posterior basis of pectoral fin	11
Length to anterior basis of dorsal fin	18
Depth of caudal peduncle just anterior to the contraction	5

It is not necessary to compare this species with the *L. acutus* and *L. leucopleurus*, since, in those respects in which it differs from *L. perspicillatus*, it is the more widely distinct from them.

EXPLANATION OF PLATES.

Plate III. Fig. I. *Grampus griseus*.

Figs. 2 and 3. Heads of two individuals.

Plate IV. *Lagenorhynchus perspicillatus*.



Cope, E. D. 1876. "Fourth Contribution to the History of the Existing Cetacea." *Proceedings of the Academy of Natural Sciences of Philadelphia* 28, 129–139.

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