TABLE I. EXTERNAL DIMENSIONS OF *Phocoena dioptrica*

Measurements taken by Wilkins	*B.M.(N.H.) Reg. No. 1922.11.3.1 Shackleton-Rowett Expedition G. H. Wilkins. coll.* ♀ *(?) juv.* (in.)	(cm.)	(per cent)	*Phocaena dioptrica.* ♀ *adult. Lahille (1912). Quilmes, Rio de la Plata. Type* (cm.)	(per cent)	*P. dioptrica.* ♂ *adult. Bruch (1916). Rio Santiago* (cm.)	(per cent)
1. Total length	53·500	135·8	100·0	186·0	100·0	204·0	100·0
2. Fork of tail to back of dorsal fin	19·000	48·3	35·6	79·0	42·5	83·0	40·7
3. Length of dorsal fin	9·000	22·9	16·9	36·0	19·4	44·5	21·8
4. Front of dorsal fin to nose*	25·500	64·8	47·7	81·0	43·6	—	—
5. Fork of tail to anus	16·500	41·9	30·9	54·5	29·3	59·0	28·9
6. Anus to vagina	1·875	4·7	3·5	6·0	3·2	—	—
7. Fork to back of paddles	40·750	103·5	76·2	—	—	—	—
8. Width of paddle†	2·750	6·9	5·1	7·0	3·8	11·0	5·4
9. Paddle to nose	10·000	25·4	18·7	35·0	18·8	—	—
10. Length of gape	3·000	7·6	5·6	9·5	5·1	—	—
11. Back of eye to nose	5·750	14·6	10·8	—	—	—	—
12. Length of eye	0·750	1·9	1·4	1·7	0·9	—	—
13. Nose to blowhole	6·000	15·3	11·3	21·0	11·3	—	—
14. Length of blowhole	2·000	5·1	3·8	—	—	—	—
15. Depth of end of gape	5·500	14·0	10·3	—	—	—	—
16. Depth at eye	7·125	18·1	13·3	—	—	—	—
17. Depth at front of paddles	9·000	22·9	16·9	—	—	—	—
18. Depth at front of dorsal fin	12·000	30·5	22·5	43·0	23·1	35·0	17·2
19. Depth including dorsal fin	14·500	36·9	27·2	—	—	—	—
20. Depth of dorsal fin	4·000	10·2	7·5	16·0	8·6	25·5	12·5
21. Depth behind dorsal fin	11·000	27·9	20·5	—	—	—	—
22. Depth at base of tail fin	3·750	9·5	7·0	9·3	5·0	—	—
23. Width at nose	3·250	8·3	6·1	—	—	—	—
24. Width at eyes	6·500	16·5	12·2	—	—	—	—
25. Width 6 in. (15·2 cm.) in front of dorsal fin	10·000	25·4	17·4	—	—	—	—
26. Width at dorsal fin	8·000	20·3	14·9	—	—	—	—
27. Width 6 in. (15·2 cm.) behind dorsal fin	6·000	15·3	11·3	—	—	—	—
28. Width at base of tail	2·250	5·7	4·2	—	—	—	—
29. Width of tail fins	12·500	31·8	23·4	—	—	47·0	23·0

* "Nose" *sensu* Wilkins is tip of snout. Lahille's equivalent dimension is the sum of his "dorsal fin—blowhole" and "blowhole—snout tip".
† This is the width at flipper insertion. The equivalent of Lahille's dimension on Wilkins's specimen is 6·2 cm. = 4·6 per cent.

[*face page 51*

NOTES ON A SPECIMEN OF *Phocoena dioptrica* FROM SOUTH GEORGIA

By F. C. FRASER*

ABSTRACT. The external form of a specimen of *Phocoena dioptrica* collected by G. H. (later Sir Hubert) Wilkins during the Shackleton-Rowett Antarctic Expedition is described. The specimen is compared with the type specimen, a female, and a referred male.

THE typescript Mammalogical Report of the Shackleton-Rowett Expedition deposited in the British Museum (Nat. Hist.) refers to a dolphin (or porpoise) collected by G. H. (later Sir Hubert) Wilkins. The provenance of the specimen is, to quote the report: "Porpoise provisionally determined as *Phocaena dioptrica* Lahille. Coll. 1 skeleton, fins and tail. Leith Harbour, South Georgia." The skeleton is in the national collection (Reg. No. 1922.11.3.1). The report includes a drawing in blue crayon (Fig. 1) showing a lateral view of the animal with a list of measurements (Table I) below it, and above—"Geo. H. Wilkins, collector, Shackleton-Rowett Expedition. Mammalogical Spec. No. 7. Sex ♀ juv. ? skeleton preserved. Original drawing made on beach at Sth. Georgia May 2nd 1922." A second drawing sheet (Fig. 2) shows three outlines of the specimen with the dimensions included in the list mentioned above indicated in inches. A third sheet has inserted into it a photographic print showing a lateral-ventral view of the carcase. Marginally, in addition to the heading already quoted, are the following notes:

> "Coloration—dark blue black and dirty yellow white (the dark blue photographs much lighter than the object in real life). Flipper almost the same colour as back, on its upper surface. Lighter on the under side and forward edges. Reported to have come ashore alive at a whaling station. It was killed by the cook and cut open before I saw it. Several whaling captains gave information that this type is often seen in 'schools' about 10 miles [16 km.] off shore. They sometimes shoot them with rifles for food. None other has been known to have come ashore alive."

It is regrettable that the photographic print is not clear enough to be reproduced but it is useful in corroboration of Wilkins's sketch.

Knowledge of the spectacled porpoise, *Phocoena dioptrica* is extremely limited. Lahille (1912) described the species from a female with foetus, taken in the Rio de la Plata. Bruch (1916) reported briefly on two specimens, male and female, taken in Rio Santiago. Wilkins's report and drawings were available to Hamilton (1941) who made use of what he required in connection with a report on a specimen acquired by him in the Falkland Islands. It was not necessary for Hamilton to reproduce Wilkins's figures or the entirety of his measurements. Considering the rarity of this porpoise, it seems desirable to do this and at the same time to draw attention to Bruch's paper, particularly to the male specimen, the distinctive shape of the dorsal fin of which seems to have escaped special notice in subsequent publications.

GENERAL SHAPE

Wilkins's specimen corresponds in general shape with the female depicted by Lahille; it differs only in detail. Thus, the dorsal profile of the head shows a concavity anterior to the level of the eye, whereas in Lahille's specimen it is above the eye, presumably in the neighbourhood of the blowhole. The base of the dorsal fin is shorter in Wilkins's specimen and its height less. It is difficult to make comparison of the flippers, either from the figures or the measurements. A tracing of the outline of a flipper cast, from Wilkins's specimen, is given for record purposes in Fig. 3.

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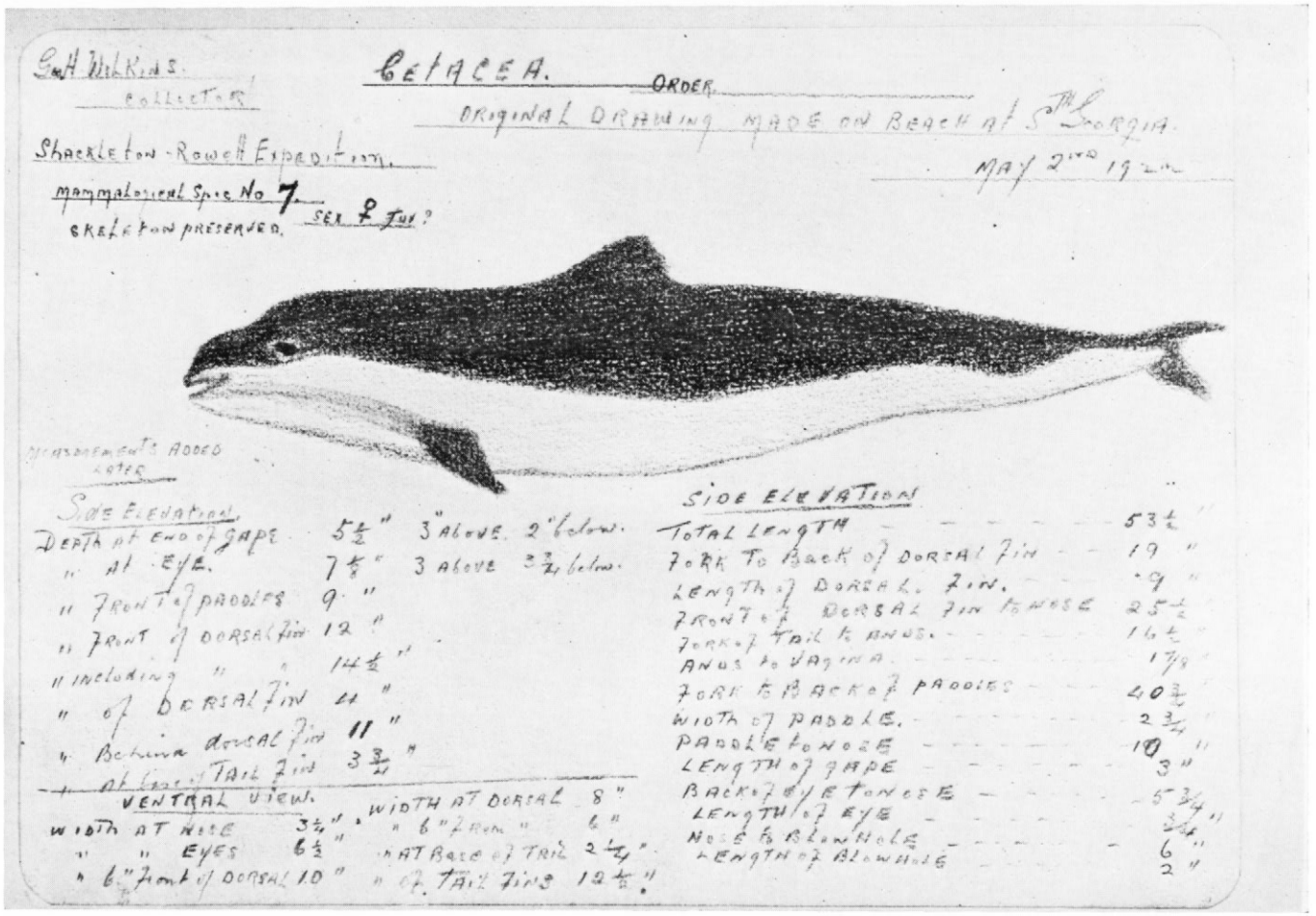

Fig. 1. Wilkins's drawing and dimensions of *Phocoena dioptrica*.

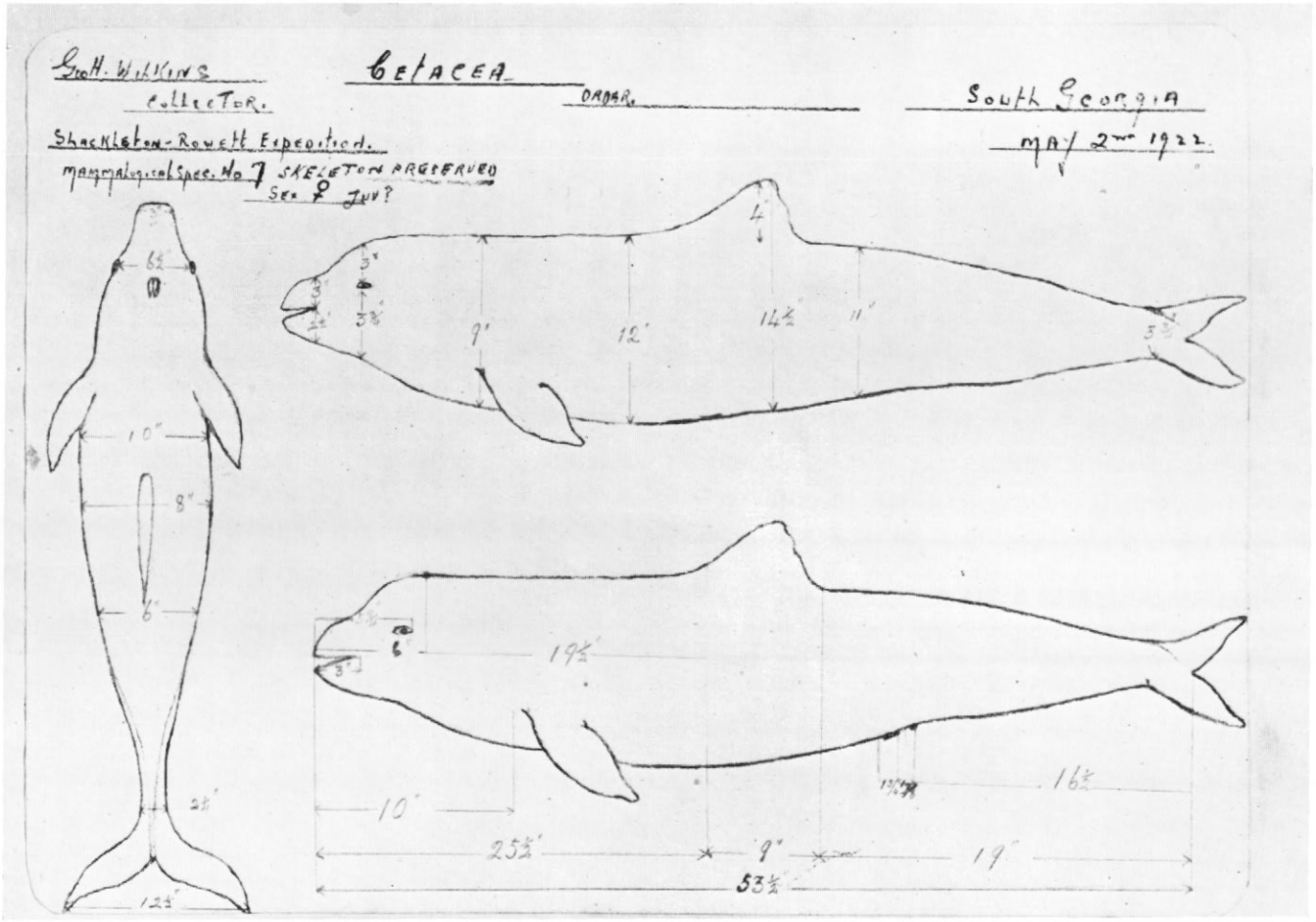

Fig. 2. Wilkins's drawings of the measurements taken by him.

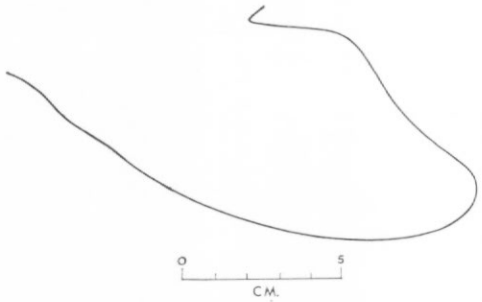

Fig. 3. Outline of flipper cast of Wilkins's specimen.

Pigmentation

The general distribution of pigmentation is much alike in all the specimens but again with differences in detail. Wilkins's crayon drawing shows the spectacled eye entirely within the border of the pigmented region of the head. Lahille's specimen (Fig. 4) shows the lower half of the spectacle projecting below the margin of the head pigmentation with a clear semi-circle of white separating the upper half from the adjacent pigmented region. In Bruch's male the position of the eye circle is indicated by an arcuate projection downwards of the pigmented margin (Fig. 5). On the snout of Wilkins's specimen the pigmented margin approximates to the upper lip to a greater extent than in either Lahille's or Bruch's specimens. Wilkins does not show the lips deeply black-bordered as they are in Lahille's and Bruch's animals, but there is indication, in pencil shading, that pigmentation was present. A band of shading extends from the lower lip of Wilkins's specimen to the anterior end of the flipper insertion.

Fig. 4. *P. dioptrica*, type specimen, a female. (From Lahille, 1912; a drawing by Mr. Arthur Smith.)

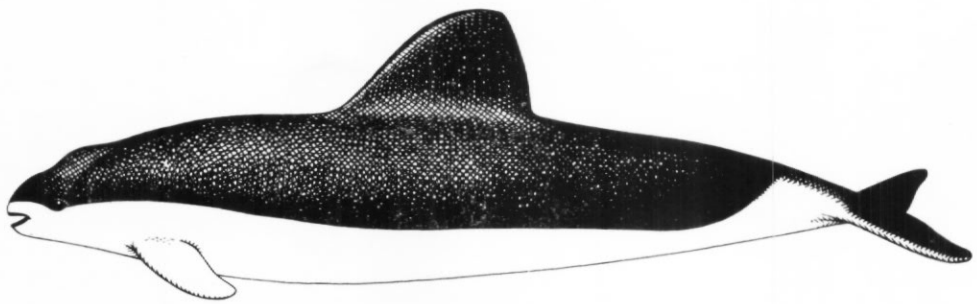

Fig. 5. *P. dioptrica*, male. (After Bruch, 1916; a drawing by Mr. Arthur Smith.)

This band is also clearly visible in the photograph. Lahille stated that the female adult had almost imperceptible grey lines extending from the angle of the mouth to the pectoral insertion. They do not show either in Lahille's figure of the adult or in Bruch's of the male but the band is quite distinct in Lahille's figure of the foetus.

The flipper of Wilkins's specimen was black on the upper surface, lighter on the under side and forward edge. Lahille's adult female had flippers with white upper surface and edges very pale grey. Bruch's male also had mainly white flippers so far as can be seen from the photograph. The photograph of the foetus indicates that the outer surface of the flipper was dark distally, white proximally, with white lines extending into the pigmented area in correspondence, it would seem, with the phalangeal orientation. The main dorsal pigmentation extends on to the caudal peduncle and dorsal aspect of the flukes of Wilkins's animal. The photograph confirms that the ventral surface of the flukes was also darkly pigmented, as shown in the crayon drawing. Lahille's description of the adult female indicates that the margin of the dorsal pigmented area sweeps up to the dorsal profile so that there is an unpigmented gap between the dorsal dark area and the pigmented dorsal surface of the flukes:

> "A little in front of the caudal neck the same colour [i.e. black] appears, which extends over the whole dorsal surface of the flukes. Below, it [i.e. the tail] is white with grey edges."

The foetus, in its caudal pigmentation, approximates more nearly to Wilkins's specimen than it does to its own parent. The picture of Bruch's male animal suggests that it too had continuity of pigmentation above the dorsal ridge of the tail-stock on to the dorsal surface of the flukes. I agree with Hamilton's (1941) assertion that, in this species, pale or uncoloured areas become more extensive with age. That changes of this kind can occur is demonstrated most clearly in the white whale or beluga (*Delphinapterus leucas*) which, when very young, is very dark grey but, as an adult, it is almost completely unpigmented.

Dimensions

Lahille (1912) gave an extensive list of external measurements of the type specimen. Wilkins's list is shorter and only those of Lahille's that correspond with Wilkins's are inserted in Table I. Bruch restricted his list of measurements to those of Lahille showing a difference in proportion in the male animal. The dimensions of the female given by Bruch correspond so nearly identically with those of Lahille's type that they are not quoted.

Apart from the dimensions of the dorsal fin about which comment is made below, the others are fairly comparable in their proportion to total length. The difference in depth of body anterior to the dorsal fin may be noted, the male being more slender than either of the females. Pregnancy might be the cause of the greater depth in the adult female but its dimensions are so slightly different from Wilkins's (?) juvenile that another explanation seems necessary. It may just be that the female of this species is naturally stouter than the male.

As the description of only one male specimen is available, the comparative comment possible must be limited, but the difference in shape of the dorsal fin of male and female is of an order not encountered elsewhere in the Phocoenae even although, within the sub-family, the diversity ranges from no dorsal fin in the Indian black porpoise to a well-formed sub-triangular fin in the common porpoise and in Dall's porpoise. The difference seen in the dorsal fin of the male and female spectacled porpoise is of an order, but not of similarity of shape, more nearly comparable with that found in the killer whale, where the dorsal fin of the female irrespective of age and of juveniles of both sexes is a relatively low, falcate appendage, whilst in adult male animals it forms a slender isosceles triangle up to 6 ft. (1·8 m.) long. It does not seem probable that the proportional increase in height from 7·5 per cent, in a doubtfully juvenile female *P. dioptrica* of 135 cm. total length, to 8·6 per cent, in an adult female of 186 cm. total length, would increase again to 12·5 per cent were the total length of the female to extend to 204 cm. It seems more likely that the dorsal fin of the male grows heterogonically at a rate in excess of that of the female to produce in the adult male a notable expression of sexual dimorphism.

In connection with the relationship of *P. dioptrica* to *P. obtusata* Philippi 1893, True (1903) referred to the latter as a remarkable species " . . . quite unlike any porpoise with which I am acquainted especially as regards coloration". Allen (1925) said "Philippi's *P. obtusata* is almost certainly a female of this last [i.e. *P. dioptrica* Lahille] and his name should, with little doubt replace *dioptrica*. His figure shows a similar form with the same enormous dorsal fin, and the sharply defined white belly." It was Bruch (1916) who, figuring two specimens of *P. dioptrica*, depicted the male with an enormous dorsal fin; the other, a female, like the female figured by Lahille, having a dorsal fin of relatively normal phocoenid proportion. True suggested an explanation for the vertical bars of white shown in the figure of *P. obtusata* as being due to the folding of the skin in packing, and then went on to say that the black pectoral fin is the only important discrepancy between this species and *P. dioptrica*, in which the flippers of the original specimen were white. It has been indicated above that the foetus figured by Lahille had partially black flippers and that those of Wilkins's specimen were black, so that True's suggestion that the pigmented flippers of *P. obtusata* might be an expression of individual variation is possibly nearer the mark than that the blackness was due to poor preservation. Nevertheless, although the apparent discrepancy may have been accounted for, the general colour pattern of *P. obtusata* is so trenchantly different from that of *P. dioptrica* that it would be inadvisable, until further evidence is forthcoming, to give priority to Philippi's specific name and to relegate *P. dioptrica* to the synonymy.

The present note is concerned with the external features of *P. dioptrica*, so that no more reference need be made to *P. stornii* Marelli 1922, based on a skull from Tierra del Fuego, than to say that its place in the synonymy of *P. dioptrica* appears to be justified.

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