SECOND RECORD OF SPECTACLED PORPOISE FROM SUBANTARCTIC SOUTHWEST PACIFIC

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ABSTRACT

An incomplete skull of unknown sex of a sub-adult spectacled porpoise (*Phocoena dioptrica* Lahille, 1912) was collected at Macquarie Island (54°30′S, 159°00′E) in July 1957. Cranial measurements are given, and the specimen is compared with other phocoenids. This is the second specimen of *P. dioptrica* reported from the subantarctic southwest Pacific, and this record adds support to the suggestion that the species may have a circumpolar distribution in subantarctic latitudes.

INTRODUCTION

The spectacled porpoise (*Phocoena dioptrica* Lahille, 1912) is a little-studied austral species of the Family Phocoenidae. It is known primarily on the basis of specimens from the southwest Atlantic Ocean (Brownell, 1975), particularly Tierra del Fuego (Goodall, 1978; Goodall and Cameron, 1979). Hitherto, the only specimen collected outside South American waters was National Museum of New Zealand (NMNZ) Ma1670, from Auckland Islands, southwest Pacific (Baker, 1977). The species apparently has been sighted alive near New Zealand (Cawthorn, 1977), and possibly Kerguelen (Frost and Best, 1976). Here we report details of a second specimen of *P. dioptrica* from the subantarctic southwest Pacific.

DESCRIPTION OF SPECIMEN

The specimen is an incomplete skull (Plates I and II, Figs 1–4) of unknown sex, collection number C10323, in the National Museum of Victoria (NMV), Melbourne, Victoria, Australia. It was collected at Aerial Cove, Cataline Point, Macquarie Island (latitude 54°30′S, longitude 159°00′E) by S. Csordas (Australian National Antarctic Research Expedition) on 24 July 1957. The skull is damaged, and lacks

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TABLE 1. CRANIAL MEASUREMENTS OF *PHOCOENA DIOPTRICA*, NMV C10323, TO NEAREST MILLIMETRE

Measurement	Millimetres
Condylobasal length	283
Length of rostrum	111
Width of rostrum at base	81
Width of rostrum at mid-length	54
Width of premaxillae at mid-length	28
Width of rostrum at 60 mm anterior to rostrum base	52
Width of rostrum at three-quarters length, measured from posterior end	43
Distance from tip of rostrum to external nares	153
Distance from tip of rostrum to broken anterior border of right internal naris	154
Preorbital width at level of most ventrally-produced portion of frontal	127
Supraorbital width, level with anterior border of right external naris	136
Greatest postorbital width	159
Greatest width of external nares (immediately posterior to broken tips of premaxillae)	34
Greatest width of premaxillae (level with anterior edge of right external naris)	46
Greatest parietal width (at parietal-squamosal-exoccipital suture)	138
Vertical external height of braincase from mid-line of basisphenoid to summit of supraoccipital	107
Internal length of braincase from hindmost limit of condyles to foremost limit of cranial cavity along mid-line	107
Greatest length of left temporal fossa	>59
Minor diameter of left temporal fossa	30
Projection of premaxillae beyond maxillae at tip of rostrum	3
Distance from foremost end of junction between nasals to estimated hindmost point of margin of supraoccipital crest	41
Length of right orbit, from most ventrally produced preorbital portion of frontal to broken anterior edge of postorbital process	45
Length of antorbital process of right lacrimal	32
Greatest width of internal nares estimated (width of right internal naris, 28)	56
Length of upper right alveolar groove	89
Deviation of skull from symmetry in dorsal view	ca. 4 degrees

teeth, posterior ends of the premaxillae, part of the left supraorbital process of the frontal, the apices of both postorbital processes, lateral portions of the supraoccipital, both squamosals, all but a fragment of left pterygoid, the hamulus and outer lamina of right pterygoid, and the left and partial right paroccipital processes. The vertex and the apices of the rostrum and right supraorbital process are abraded. The specimen exhibits no noteworthy differences from previously described individuals of *P. dioptrica*.

The absolute age of the specimen cannot be determined, as teeth, which might exhibit incremental growth lines, are absent. Other cranial features suggest that the animal is sub-adult. Traces of the frontoparietal suture remain, and the basisphenoid-presphenoid suture was not fused, which suggest immaturity, but the fusion of interparietal and parietal indicates that the specimen is at least older than the equivalent of age-class III of *Stenella attenuata* as defined by Perrin (1975).

Measurements of NMV C10323 (after Perrin, 1975: Table 2) to the nearest 1 mm are given in Table 1.

DISCUSSION

Extant species of phocoenid are generally differentiated on the basis of external morphology, and the only comparative description of the skulls of species of *Phocoena* that we are aware of is that of Norris and McFarland (1958). Only two phocoenid skulls (*P. phocoena*, NMV C24749; *P. dioptrica*, NMNZ Ma1670) were available to us for comparison with the Macquarie Island specimen. Thus, we base our identification of NMV C10323 primarily on descriptions and/or illustrations of phocoenid skulls given by Norris and McFarland (1958), and other authors, as follows: *Phocoena phocoena*, Hamilton (1941), Norris and McFarland (1958), Van Bree *et al.* (1977); *P. dioptrica*, Marelli (1922), Hamilton (1941), Praderi (1971), Brownell (1975), Baker (1977), Goodall (1978), Goodall and Cameron (1979); *P. sinus*, Norris and McFarland (1958); *P. spinipinnis*, Allen (1925), Praderi (1971), Goodall (1978); *Phocoenoides dalli*, True (1885), Andrews (1911), Miller (1930); and *Neophocaena phocaenoides*, Allen (1923), Shaw (1938), Pilleri and Gihr (1975).

On the basis of information provided in the above literature, it appears that adult specimens of *P. dioptrica* differ from those of *P. phocoena*, *P. sinus*, and *P. spinipinnis* in that the dorsal surfaces of the rostrum and supraoccipital are in the same plane, the dorsal surface of the rostrum is more flattened, the premaxillae are elevated less above the maxillae, the dorsal and ventral surfaces of the rostrum are more nearly parallel, the apex of the rostrum is attenuated more abruptly (dorsal and lateral views), the face slopes more steeply from the vertex to the external nares (note vertex wear in C10323), and particularly from the vertex to the nasal tubercules, the nasals are placed more ventrally, the vertex is longer, the postorbital portion of the cranium and temporal fossa are shorter and deeper, the postorbital process of the frontal is more robust and has an elongate base, the zygomatic processes are exposed less in dorsal view, and the teeth are smaller, and more loosely inserted in less prominent alveolar grooves. *P. dioptrica* differs also from *P. phocoena* in its longer, broader skull, and convex maxillary portion of the palate, and from *P. sinus* in the larger skull, posterior margin of palate with broad W shape indentation, convex maxillary portion of the palate, and relatively less exposure of frontal on the dorsolateral portion of braincase.

Phocoena dioptrica appears to differ from *Neophocaena phocaenoides* in all cranial features listed above except possibly the structure of the postorbital and zygomatic process. Also, the skull of *P. dioptrica* is relatively larger, the rostrum is relatively longer, and the rostrum is bent less relative to the basicranial axis. Cranial differences between *Phocoena dioptrica* and *Phocoenoides dalli* are not clear from a perusal of literature, and these species appear to be similar in that, for example, the dorsal surfaces of the rostrum and flat-topped supraoccipital are in the same plane, the dorsal surface of the rostrum is relatively flat, the face slopes steeply from the vertex to the external nares (noted by Brownell, 1975; although in the specimen of *Phocoenoides dalli* figured by Miller 1930, this appears more shallow), the nasals are placed relatively ventrally, the postorbital process is robust with a relatively long base, the zygomatic process is poorly exposed to dorsal view, and the teeth are

relatively small, and inserted in a poorly developed alveolar groove. The main cranial differences between these species (discerned from published figures) appear to be that the postorbital part of the cranium and the temporal fossae are relatively shorter and deeper in *P. dioptrica*. The postcranial skeletons of *Phocoena dioptrica* and *Phocoenoides dalli* are, however, very different (compare Brownell, 1975: fig. 1 and Goodall and Cameron, 1979: fig. 5, with Miller, 1930: plate 1). *Phocoena dioptrica* is similar to other species of *Phocoena* while *Phocoenoides dalli* possesses very tall, anteroposteriorly narrow neural spines with reduced zygapophyses and anteroposteriorly narrow centra.

We identify NMV C10323 as *Phocoena dioptrica* because it exhibits features which can be used to separate positively-identified specimens of *P. dioptrica* from other species of phocoenid. However, limited information on the comparative cranial osteology of phocoenids, as well as our limited access to specimens, makes the above comparisons provisional and the former indicates the need for a general review of phocoenid osteology.

The Macquarie Island record, which is only the second positive occurrence outside southern South American waters, certainly indicates that *P. dioptrica* has a wider distribution than was known only a few years ago (e.g. Brownell, 1975). This record, and sightings apparently of *P. dioptrica* near New Zealand (Cawthorn, 1977) and Kerguelen (Frost and Best, 1976), support Barker's (1977) suggestion that the species may have a circumpolar distribution in subantarctic latitudes. Undoubtedly, much new information on the species will result from the recent work of Goodall (1978; Goodall and Cameron, 1979) in Tierra del Fuego. Whereas Brownell (1975) observed that only ten occurrences then were known of *P. dioptrica*, Goodall (1978) listed 112 specimens, and mentioned another 29, from Tierra del Fuego alone. These beach collections suggest that the spectacled porpoise is the most common small cetacean in inshore waters around Tierra del Fuego, but the absence of sightings of live animals even in areas of high stranding densities attests to the cryptic behaviour of the species. It is likely that strandings, rather than sightings of live animals, will constitute further records of the species from the subantarctic southwest Pacific and, in view of the northward distribution of the porpoise into temperate South American waters (Brownell, 1975), strandings might be expected in New Zealand.

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EXPLANATION OF PLATES

PLATES I AND II

Skull of *Phocoena dioptrica*, NMV C10323. Skull length 283 mm.

Fig. 1. Dorsal view.
Fig. 2. Left lateral view.
Fig. 3. Anterior view.
Fig. 4. Ventral view.

Fig. 1.

Fig. 2.

Fig. 3.

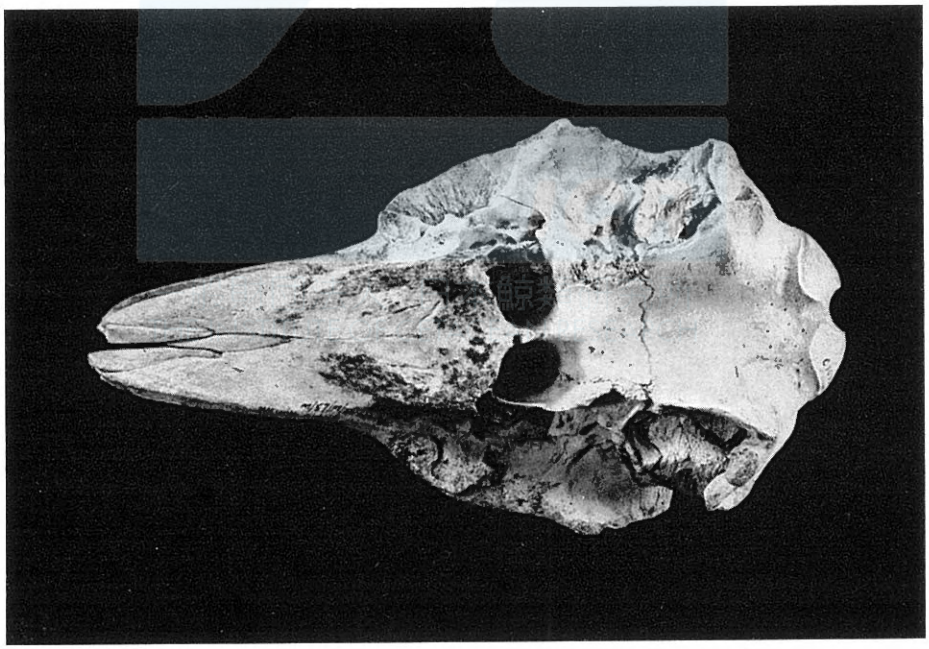

Fig. 4.