II.—ZOOLOGY.

Art. XIX.—*On the Whales and Dolphins of the New Zealand Seas.*

By James Hector, M.D., F.R.S.

[*Read before the Wellington Philosophical Society, 6th November*, 1872.]

The study of Cetaceans is beset with difficulties not experienced in other groups of the fauna of a country. The huge size of most of the species prevents the preservation of complete specimens, and opportunities occur but rarely when they can be examined in the recent state, prior to the preservation of the skeleton.

Many of the genera and species have for this reason been founded on imperfect and fragmentary skeletons that have not been identified with the living animal, so that their descriptions are necessarily almost as vague and inconclusive as those of the fossil remains of extinct forms. The following notes refer chiefly to specimens in the Colonial Museum, and are only offered in the hope that they may assist in the collection of more accurate information than we at present possess respecting this most interesting section of our fauna.

The most complete work of reference on this subject is Dr. Gray's "Catalogue of Seals and Whales in the British Museum," 1866;* taken along with his amended synopsis published in 1868.† The classification adopted in the latter work has been chiefly followed, except with reference to the Ziphid whales, in which I adopt the groups proposed by Professor Flower in an article contributed to *Nature* in December last.

It should be remembered that in many cases, and especially in the latter group, the classification is that of the anatomist, or rather the osteologist only, while in some other cases in which the external characters of the animal have been obtained, the distinctions are sufficiently minute to satisfy the systematist. On this account there is greater difference of opinion respecting the value of generic and specific characters in this order than in almost any other, and a corresponding confusion and instability in the nomenclature. It is therefore important that no opportunity should be neglected of collecting not only specimens but also of making sketches, however rough, with exact measurements of the larger species, showing the proportions, position of fins, and other

* "Catalogue of Seals and Whales in the British Museum," by J. E. Gray, F.R.S., 1866.

† "Synopsis of the Species of Whales and Dolphins in the Collection of the British Museum," by J. E. Gray, Ph.D., F.R.S., 1868.

characters. As Cetaceans are not unfrequently cast up on the coast of New Zealand, I may state, for the guidance of collectors, that the bones which it is most important to preserve are the skull and ear bones, vertebræ of the neck, shoulder blade, first two or three ribs, and a few of the segments selected from different parts of the vertebral column, but in the smaller species the whole skeleton should be collected if possible.

NEOBALÆNA MARGINATA.

Western Australian Whale.

Balœna marginata, Gray, "Cat. Seals and Whales," p. 90; Hector, *Trans.* N.Z. Inst., II., 26, Pl. 2b. *Caperea antipodarum*, Gray (in part) l.c. 101. *Neobalœna*, Gray, "Ann. and Mag. N.H.," 1870, 154; *Trans.* N.Z. Inst., III., 123.

Ear Bone, Pl. VI., figs. 1a. and b.

This whale has been described only from some plates of baleen in the British Museum, and from the skull and baleen of a small individual, 16 feet long, that was cast ashore on the island of Kawau, and is considered by Dr. Gray to represent in the Southern Seas the great Right Whale of the Arctic Ocean.

The baleen or whalebone is the most flexible, elastic, and toughest of any yet discovered, but is of very small size. It is on account of this character, taken along with the proportional dimensions of the baleen, that Dr. Gray places this whale among the true Balænidæ, but the external characters of the animal have not yet been observed.

The young skull, which is 4 feet 9 inches long, is depressed, and may be recognized from other baleen whales by the great length of the brain cavity, which very nearly equals the beak, and by the feeble articulation of the lower jaw. The baleen is slender, white, with a black outer margin, frayed on the inner edge to a fringe of single fine hairs, and having a highly enamelled surface.

The ear bones (Pl. VI., figs. 1a. and b.) are oblong, rough, the outer margin thick and rounded, the lower edge truncate, and the back convex. The aperture is contracted above but wide below, the wide portion being less than half the length of the bone. It is evidently on the ear bone of this species that Dr. Gray has founded his *Caperea antipodarum*, or New Zealand Right Whale, a species which must therefore be reserved until supported by further observation.

EUBALÆNA AUSTRALIS.

The Black Whale—Tohora.

E. australis, Gray, l.c. 91. *Balœna (Caperea) antipodarum*, Gray, (in part) l.c. p. 101; Dieffenbach's N.Z., II., Tab. 1.

Ear bone, Pl. VI., f. 2.

These two species are for the present placed together because whalers do not recognize two kinds of Black Whale, and the only portion of the second species which is described by Dr. Gray is an ear bone sent to the British Museum from Otago by Mr. Stuart, but which, as already stated, I find to agree with that of his *Neobalœna marginata*. The skeleton of *Caperea antipodarum* in the Paris Museum (Gray, l.c. 371), taken on the coast of New Zealand, is however considered by Professor Flower to differ from that of *B. australis* in having square nasal bones and a simple (not forked) first rib.

The Black Whale is the largest and best known of all the whales on the New Zealand coast, reaching a length of 60 feet. Its huge bones may be seen strewn on the beach in great profusion at any of the whaling stations, but generally in a bad state of preservation. The skull is triangular, convex, with the beak bent down rather suddenly, and the posterior part depressed, the brain cavity being only one-third the length of the beak. The vertebræ of the neck are united into a compact mass, the spinous processes forming a solid crest. The ear bone (Pl. VI., fig. 2) is rhombic, with a large oblong aperture. The baleen is thick, rather brittle, with thin enamel, and margined with a thick fringe. The blades are from 2 to 9 feet in length.

The females visit the bays and inlets round the coast to calve during the winter months from May to August, where they are captured by the shore whalers. The males are seldom caught, as they rarely approach the land and are more shy and wild than the females. From October to May the Black Whales are only captured by cruisers on the whaling ground which extends from the Chatham Islands to Norfolk Island.

Several vertebræ, and two imperfect tympanic bones of this whale are in the Museum.*

MEGAPTERA NOVÆ ZEALANDIÆ.

New Zealand Humpback.

M. novæ-zealandiæ, Gray, l.c. 128.

Ear bone, Pl. VI., figs. 3a. and b.

This species is also founded by Dr. Gray on the ear bone alone, and has not been clearly identified. A whale that was captured in Wellington

* A very perfect tympanic and periotic bone has been obtained in Preservation Inlet, on the West Coast of Otago, since the above was written, and agrees with the figure of the Ear Bones of the adult *Balœna australis* given in Huxley's "Comp. Anatomy," p. 397.

Harbour in 1869 appears to have been of this species from the character of the ear bone, which unfortunately was the only part preserved of the animal, which measured 34 feet in length.

The Humpback whales are well known to whalers, but are seldom molested. According to Bennett they roam about the ocean in small herds, seldom at any great distance from land. They are to be recognized by their having a short robust form, broad flat-topped head, a low broad dorsal fin or lump behind the middle of the body, very long pectoral fins, and the skin of the throat and chest deeply plaited with longitudinal folds.

The baleen is short, broad, and triangular, but much longer than the breadth at the base, edged with bristles that are thick and ridged near the tip. (Gray.)

There are in the Museum three ear bones (Pl. VI., figs. 3a. and b.) which I refer to this species, one of them being from the skull of the individual referred to as having been caught in Wellington Harbour.

PHYSALUS AUSTRALIS.

Southern Finner, or Razorback.

P. australis, Gray, l.c. 161. *P. antarcticus*, Gray, l.c. 164.

The only reason suggested by Dr. Gray for distinguishing the second of the above species is that a quantity of Finner's baleen has been imported from New Zealand that is yellowish-white, the baleen of the Northern Finner or Great Rorqual (*Physalus antiquorum*) being slate grey, but the colour of the baleen of his *Physalus australis* is not mentioned so that the above distinction requires to be verified. The Finners are the longest of the whale species, and are distinctly referred to by some authors as occurring in the New Zealand seas. They are, however, rarely caught, as their great size and activity render them formidable antagonists, while the quantity of oil they give is small and their baleen has no commercial value. Like the Humpbacks they have the throat and belly longitudinally plaited, but differ in having a high falcate dorsal fin and pectorals of moderate length. The bones of the neck are not united.

This whale is not represented as yet in the Colonial Museum.

CATODON MACROCEPHALUS.

Sperm Whale.

C. macrocephalus, Lacép, Gray, l.c. 202.

The Spermaceti Whale is not uncommon in the north latitudes of New Zealand, eastwards to the Chatham Islands, and occasionally as far south even as Stewart Island. According to Dieffenbach, they often fall a prey to the

whaling ships which cruise in the open sea, but rarely approach the coast like the Black Whale. Several teeth of Sperm Whales are in the Museum, and also other varieties of smaller sized teeth of several forms, chiefly found on the east coast of Wellington, which have not yet been referred to any species. Dieffenbach mentions a Sperm as having been brought ashore in Tory Channel, respecting which Mr. Wilson, an old whaler now living at Waikanae, informs me he was one of the party that secured this very whale, and that it was a dead animal, in such an advanced state of decomposition that nearly all the bones had dropped out of the flesh. He states that such boneless bodies of whales are not uncommonly met with drifting about in the ocean. The head of a large Sperm Whale used to lie in the sand-hills south of Waikanae, but was broken up by the natives some years ago for the sake of the teeth.

DELPHINUS FORSTERI.

Forster's Dolphin.

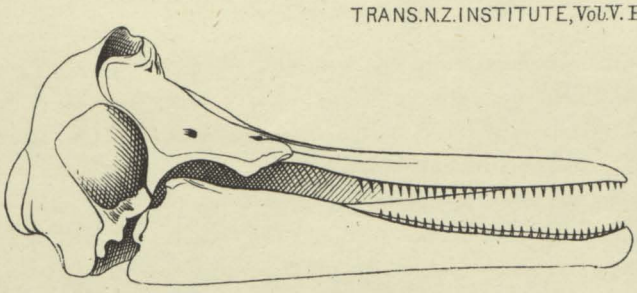
D. forsteri, Gray, l.c. 248.

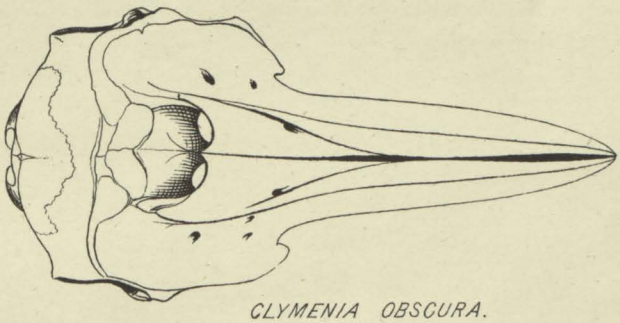
Pl. II. and III.

The skull of this species, which was founded on a drawing by Forster, has not been described, but I provisionally refer to it two skulls obtained on the west coast of this province, which do not agree with any described species, though resembling most nearly the Cape Dolphin (*D. longirostris*, Gray, l.c. 241), but differing from it in having a much shorter beak and fewer teeth.

Skull rounded behind; beak rather linear, depressed on the sides, three-fifths the total length, and three times the width at the notch; intermaxillaries narrow, forming a prominent hard ridge, and united for a third of their length to form a bony tube; maxillaries with a third ridge in front of the notch; hinder wing with a flat area over the orbit, and bent up posteriorly; supra-occipital crest prominent; forehead sloping; blowers small, equal to middle width of beak; nasal processes prominent; triangle rough, without defined margins, not extending to the teeth; symphysis of lower jaw equal to half the width of beak at the notch; *Palate with a groove on each side*, deep behind and shallow in front.

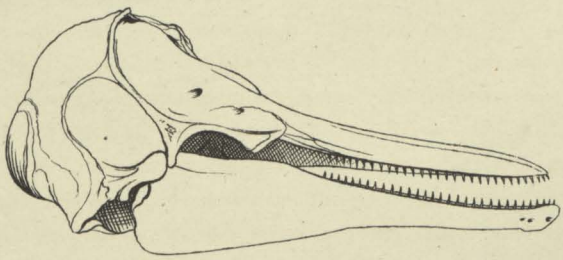
A.—Skull, Waikanae beach. B.—Skull, Wanganui beach, from Rev. R. Taylor, F.G.S. C.—The skull of a porpoise, captured in the South Atlantic in June, 1872, during the voyage of the "Electra" from London to New Zealand, agrees with the above in every respect, except in the teeth which are fewer in number. The teeth are quite perfect, and are small and incurved. This specimen has been taken to England by James Brogden, Esq.

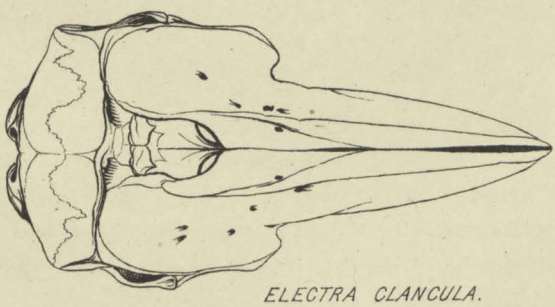




CLYMENIA OBSCURA.

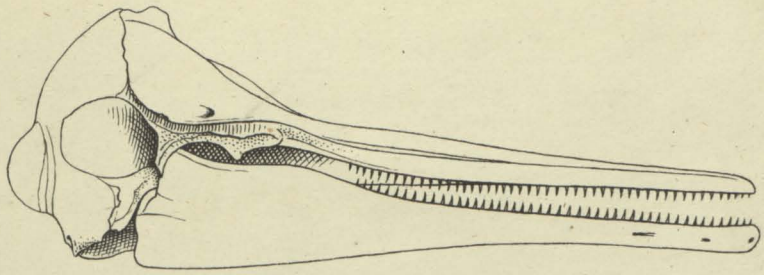
1/5 Nat. size.

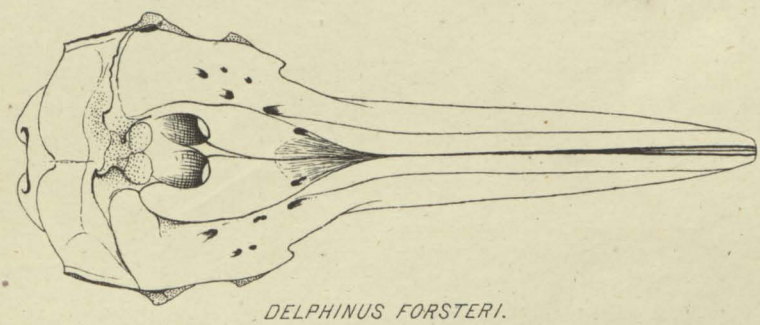




ELECTRA CLANCULA.

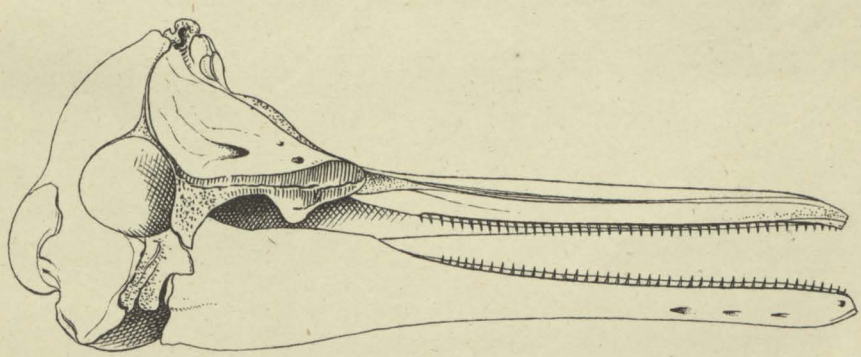
1/5 Nat. size.

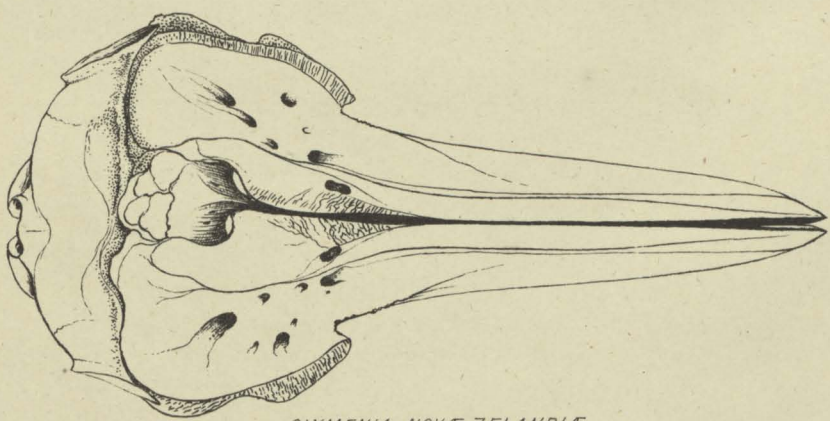




DELPHINUS FORSTERI.

1/5 Nat: size.





CLYMENIA NOVÆ ZELANDIÆ.

1/5 Nat: size.

MEASUREMENT OF SKULLS IN INCHES.

	A.	B.	C.
Total length	18	17	17·5
Length of beak	12	11	10·5
Width at notch	3·6	3·5	3·5
Width at middle of beak	2	2	2
Teeth	$\frac{45}{47}$	$\frac{46}{48}$	$\frac{44}{42}$

The following is abridged from Forster's description of the Porpoise, to which I attribute these skulls :—

Teeth $\frac{44}{44}$ Body straight, round, thickest behind; head rounded, shelving in front; beak, pointed, straight, attenuated; lower jaw longest; dorsal fin in middle of back, triangular falcate; tail-lobes sub-falcate; tail attenuated, keeled above and below; pectoral lanceolate, scarcely as long as the beak.

Greenish brown or rust colour above, white beneath, a white spot on the dorsal and pectorals. Length, 6 feet. (Gray, l.c., 248.)

I have frequently seen a porpoise answering to this description, as far as could be judged from a boat, in Queen Charlotte Sound and Blind Bay.

CLYMENIA NOVÆ ZEALANDIÆ.

Cow-fish.

Delphinus novæ-zealandiæ, Q. and G. Gray, l.c. 246.

Pl. II.

The skull of a large porpoise cast ashore at Waikanae appears to belong to this species, but having a flat palate it must be removed from the genus *Delphinus* to *Clymenia*. It resembles *C. euphrosyne*, but has a more slender beak and a larger number of teeth in the lower jaw.

Skull rounded behind, forehead sloping rather abruptly; crests and nasal bones prominent and rough; maxillaries spongy, expanded, posterior wing with horizontal and ascending areas; intermaxillaries elevated, callous, a little expanded in the middle of the beak, not united, and wide apart in front.

Triangle bounded by a callous ridge, very rough, extends beyond the hinder teeth; blower small, equal to half the width at notch; *palate flat*; length of symphysis of lower jaw equals one-third the width at the notch.

Length	19 inches.
Beak	11·5 ,,
Width at notch	4·5 ,,
Width in middle	3 ,,
Teeth	$\frac{44}{47}$

The description of *D. novæ-zealandiæ*, to which I suppose the skull to belong, is as follows, and applies with deviations in colouring to a very large species of porpoise that frequents the West Coast Sounds and is known as the Cow-fish :—

Teeth $\frac{43}{47}$; body elongate, rounded in front; beak cylindrical, flattened, and pointed; lower jaw longest; forehead rounded and prominent; dorsal fin large, triangular, rounded at tip; tail-lobes flattened, with a compressed keel between the base and the dorsal fin; caudal small, nicked, cordate; pectorals moderate, falciform.

Above black-brown, edge of upper jaw and beneath dull white, with a yellow band from the edge along the side to beneath the dorsal; tail slate colour; pectoral and dorsal dull white, the latter with a dark edge. The lower jaw with small pores, and the body with small plates of regularly twisted white striæ.

Length 5 feet 10 inches, (Gray, l.c., 246.); but the Cow-fish reaches to at least 8 feet in length.

CLYMENIA OBSCURA.

Tursio obscurus, Gray, l.c. 264.

Pl. I.

Skull much rounded behind; crests feeble but sharp; forehead slightly concave in outline; maxillaries sloping on side of beak, constricted and rough before the notch, and with a slightly concave hinder wing; intermaxillaries not elevated, tapering, callous, with a marked ridge bounding the triangle which extends to opposite the twelfth tooth from the back; blowers very wide, equal to two-thirds the width at the notch; symphysis of lower jaw short, equals one-fourth of jaw; *palate flat*; teeth $\frac{34}{28}$.

This skull, obtained on the Wanganui beach by the Rev. R. Taylor, agrees with the figure and description of the above species.

The body is described as black, with diverging streaks on the side, and whitish beneath. It has a distinct dorsal fin situated two-fifths from the snout; the entire length being about 5 feet.

ELECTRA CLANCULA.

New Zealand Bottle-nose.

Lagenorhyncus clanculus, Gray, l.c. 271. Hector, "Ann. and Mag. N. H.," 1872, 436.

Pl. I. and III.

Teeth $\frac{32}{32}$; head convex; snout conical; lower jaw longest; body fusiform; greatest height one-fifth total length; pectoral narrow, falcate, equal in length

to base of dorsal; a single dorsal, low and rounded, commences at middle of back and over the umbilicus. Tail-lobes narrow, falcate, each one-third longer than the pectoral.

Nose and forehead pure white, bounded by a crescent of black behind the blow-hole, sharply defined in front, but shading off behind to light grey, which is the uniform colour of the upper surface of the body. Fins are all darker than the trunk; there is also pure black round the blow-hole, cloaca, and vent. The white of the snout extends behind the eye, but the dusky colour extends forward beneath the angle of the mouth. The lower aspect is white as far back as the vent, but is crossed by an isthmus of dark grey beneath the pectorals. The white band is continued by two lateral stripes that ascend on the flanks. The colouring, as far as I have been able to judge by casual inspection is very uniform in all the individuals.

This dolphin differs in external characters from the genus *Lagenorhynchus* (as described in the "Catalogue of Seals and Whales," p. 267) in the forward position of the dorsal, and the absence of a second fin-lobe on the back.

Common in Cook Strait, and on the West Coast as far south as Jackson Bay, travelling in large schools.

A Bottle-nose shot in 1871 had a total length of 51 inches, girth 32 inches, and weight 78 lbs.

DIMENSIONS.

	Inches.
Snout to anterior margin of pectoral	12
„ angle of mouth	6
„ blow-hole	8
„ commencement of dorsal	24
„ umbilicus	24
„ vent	36
Length of base of dorsal	8
Spread of tail	15
Length of anterior margin of tail-lobe	12

There is a complete skeleton and several skulls and lower jaws in the Colonial Museum, this being the most commonly cast up of any of the dolphins round the coast.

The skull is flask-shaped, the beak being wide at the base, rapidly tapering to an acute point in front, with the edges bevelled in a regular manner. The teeth are small, cylindrical, curved, and pointed. *Palate slightly concave.*

The length of the adult skull is 14 inches, the beak forming half the length, and being three times the width of its middle part; height of the occiput 5·7 inches. The cervical vertebræ are anchylosed into a solid mass 1·3 inch in length.

The dentition of the various specimens in the Museum is as follows, and shows that this character is a reliable one for the determination of species.

	Length of lower jaw.	Teeth.
1. Skull of complete skeleton	11·	$\frac{32}{31} - \frac{31}{31}$
2. „ „ „	9·	$\frac{31}{31} - \frac{31}{31}$
3. Skull	10·	$\frac{32}{31} - \frac{31}{31}$
4. Lower jaw	12·5	$\frac{}{31} - \frac{}{32}$
5. „ „	12·	$\frac{}{31} - \frac{}{31}$
6. „ „	12·	$\frac{}{31} - \frac{}{31}$
7. „ „	11·	$\frac{}{31} - \frac{}{32}$

In every case three or four of the front teeth are feeble and irregularly developed, the variation in the numbers observed depending on the condition of this part of the jaw.

The other teeth are cylindrical and acutely incurved, the middle ones being the best developed.

TURSIO METIS.

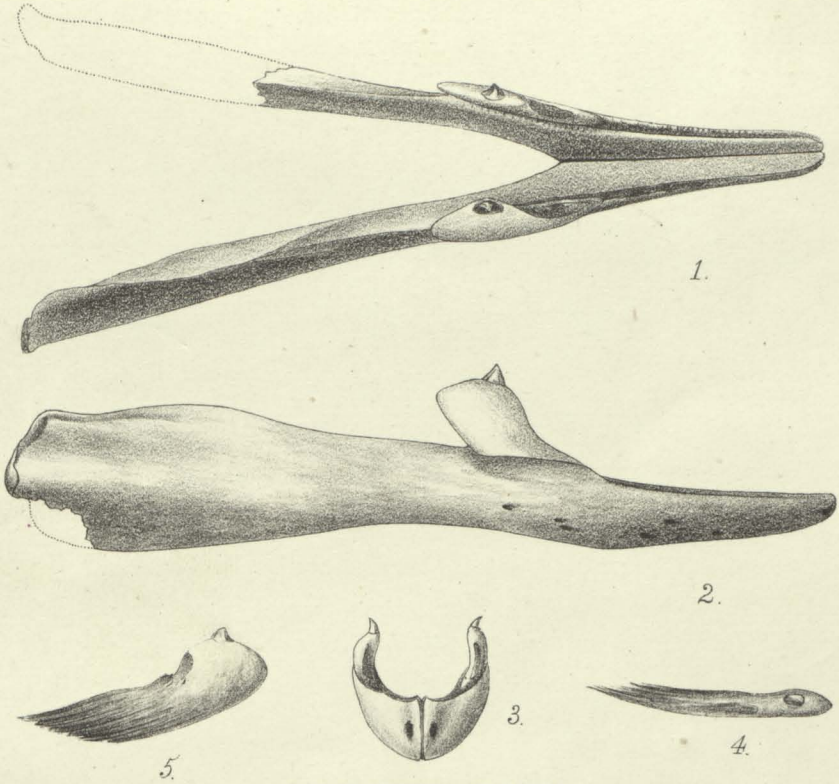
T. metis, Gray, l.c. 256.

Animal unknown. Skull globular; back of blower tubercular; rostrum thick, conical, tapering, longer than head, and more than twice as long as width at notch; intermaxillaries convex and more than half the width of the beak; triangle extends to the commencement of the tooth series; *teeth large,* the sockets being half an inch from centre to centre, $\frac{22}{21} - \frac{22}{21}$.

To this species, which is founded on a single skull in the British Museum, the habitat of which is unknown, I refer a skull obtained by Mr. T. H. Potts at Dusky Bay, which has the following measurements :—

	Inches.
Length	21·
Width at orbits	10·
„ notch	5·3
„ middle of beak	3·
Length of beak	11·5
„ lower jaw	17·5
„ dental groove	10·

The teeth are wanting, but the lower jaw appears to have had a slightly larger terminal tooth on each side directed obliquely forwards. The tooth sockets are very large, and nearly an inch in depth. The lower jaw is very stout.



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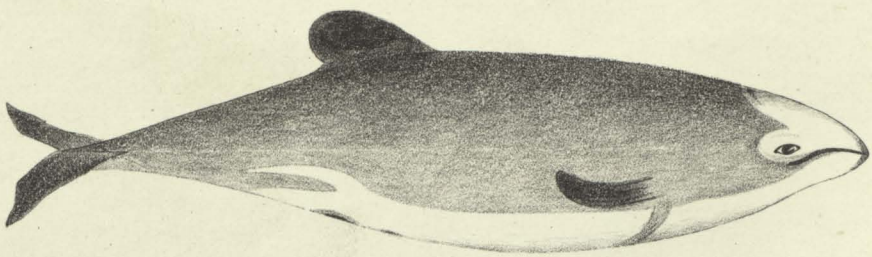
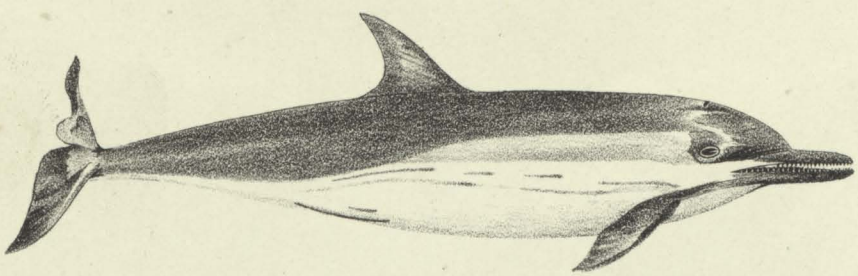
DOLICHODON LAYARDII.



J. Hector del. J.B. lith.

ELECTRA CLANCULA.



J.R. Forster del. J.B. lith.

DELPHINUS FORSTERI.

PSEUDORCA MERIDIONALIS.

Tasmanian Black Fish.

P. meridionalis (Flower), Gray, l.c. 291.

Teeth, $\frac{8}{10}\frac{8}{10}$; head rounded, scarcely beaked; black on back and sides, lighter below; male head larger than female; head obtuse, like that of a Sperm Whale; pectorals small; dorsal hook-shaped, situated one-third the total length from the tail; teeth conical, acute, very large; compressed on the sides; skull rounded; beak short, tapering; intermaxillary broad. (Gray.)

An imperfect skull in the Colonial Museum appears to resemble this species. The occipital area is rounded and tumid without any marked crests or ridges. Its length is 9 inches, and the width at the notch is 13 inches. The whole of the beak is wanting. The bones of this skull have a soft porous texture. It was picked up in Lyall Bay.

To this species I also refer the skeleton of a young animal found on the Kaiapoi beach, and now being prepared for the Canterbury Museum. The teeth $\frac{10}{10}-\frac{10}{10}$ are rather widely set, black in colour, incurved, and many of them split longitudinally.

GRAMPUS RICHARDSONI.

G. richardsoni, Gray l.c. 299.

Teeth $\frac{}{4}-\frac{}{4}$; lower jaw straight, regularly diverging, scarcely bulging on the side behind, united with a rather long, wide symphysis, obliquely truncate in front, with a rather prominent tuberous gonyx; teeth far apart, conical, tapering at tip, but sub-cylindrical at base.

Animal unknown. Cape seas.

A lower jaw obtained on the Manawatu beach, and placed in the Museum by Dr. Buller, appears to agree with the above, but has only three teeth on each side.

Its length is 15 inches.

BELUGA KINGII.

B. kingii, Gray, l.c. 309.

Teeth $\frac{10}{9}$; head rounded; teeth conical, hooked, often truncate, the upper ones often wanting; no dorsal; skull with nose and outer wing of maxilla bent over the orbits, making the forehead very convex; beak short, not half the length of the skull, and scarcely longer than the width at the notch; skull, entire length 13·5 inches; beak 5·5 inches; width at orbits 8 inches, at notch 4·5 inches. (Australia.)

A very imperfect skull in the Museum from the Swainson collection agrees with the above dimensions and characters as far as can be ascertained. A large light-coloured porpoise is not uncommon at certain seasons in Blind Bay, which may perhaps be this species.

GLOBIOCEPHALUS MACRORHYNCHUS.

New Zealand Black-fish.

G. macrorhynchus, Gray, l.c. 320.

Teeth $\frac{8}{8} - \frac{8}{8}$; head very much swollen, thick, square, and short; snout blunt; teeth, sub-cylindrical; angles of the lip curved upwards; body clumsy and terminates abruptly; colour uniform black; skull broad; beak wide, nearly as broad at the middle as at the notch; intermaxillaries expanded to cover nearly the whole upper surface.

Total length 16 to 20 feet. (Gray.)

Two skulls in the Colonial Museum, prepared by Dr. F. Knox; length 26 inches; height of occiput 14 inches; length of beak 15 inches, and width at notch 11 inches.

Five cervical vertebræ anchylosed.

The Black-fish visit the coast in large schools, and occasionally run into shallow bays, where they get stranded, and fall a prey to the natives and settlers. They yield from 30 to 35 gallons of inferior oil, but are not killed without some risk, as they occasion a sickness or vertigo to those who slaughter them, which has sometimes been attended with fatal results. (See *Trans.* N.Z. Inst., I., 44.)

EPIODON CHATHAMIENSIS.

Goosebeak Whale.

Pl. IV. and V.

Beak of skull tapering with a slight upward curve; vomer forming a callous ridge, depressed between the intermaxillaries; upper jaw toothless, lower jaw elongate, tapering, bent up and truncate, terminating in two short cylindrical teeth, with a sunken dented groove behind them.

A skull, without styloid processes or tympanic bones, and having the sperm cavity laid open, collected by Mr. H. Travers at the Chatham Islands, has the following dimensions:—

	Inches.
Total length, with lower jaw	36
Width at orbits	20
Width at notch	12
Height of crest, above occipital foramen	15

	Inches.
Width of occiput	15
Length of beak from pre-orbital notch	18
Brain cavity—length	6
Sperm cavity—length	12
„ „ width	5
Width of beak at 12 inches from extremity	5
Lower jaw—length	30
„ „ height of ramus	7

Weight of teeth 817 and 836 grs.

The beak is trigonal, obliquely truncate, and slightly upturned, three times the length of the brain cavity; vomer is small, fusiform, truncate posteriorly (probably from its having been broken off in opening the sperm cavity) callous and depressed in a groove that is formed by the thin callous margin of the intermaxillaries, which are continued backwards to form a moderately high ridge, inclosing an oval basin, and rising to a deeply-notched crest that overhangs the blowers at the level of the supra-occipital crest; the beak is slightly unsymmetrical at the point, being twisted to the right; the blowers are strongly twisted to the left; the maxillaries are slightly elevated, inclosing a lateral groove on each side of the beak, which groove expands backwards to form shallow supra-orbital basins.

On the lower aspect of the beak there are imperfect dental grooves, but no tooth sockets, nor any acute tubercular granulations as described in *E. desmarestii*.

The lower jaw projects three inches beyond the beak, the thin callous rami having straight, entire, upper margins as far as the commencement of the symphysis, where they curve upwards and end in a conical, truncate point, which is level with the upper surface of the beak when the mouth is closed, and terminates in two short, stout, slightly compressed teeth (Pl. V., 2a. and b.), two inches long and four in circumference, implanted in shallow sockets. The teeth have slight irregular striæ, and are worn down into two lateral facets divided by an acute ridge. The position of the teeth, when the jaws are closed, is two inches beyond the upper mandible, and unless they are applied against callosities on the upper lip it is difficult to conceive how they are worn down to this acute form. Two teeth of similar form, taken from the jaw of a whale cast up on the Manawatu beach, have their facets forming an obtuse pyramidal tip (Pl. V. 3.) A shallow dental groove extends back from the tooth sockets for fifteen inches with well marked nutrient foramina that indicate twenty-two suppressed teeth.

Only two species of *Epiodon* are known, and it is possible that the above may be identical with *Epiodon australis* from Buenos Ayres, the description of

which I have not seen. Except in the upward curve of the beak, and the less development of the vomerine callosity, this skull resembles *Petrorhynchus capensis*, Gray, l.c. 345*.

Since the above was written I have examined the skull of a very old female specimen of this whale, captured in Port Cooper, the complete skeleton of which is being prepared in the Canterbury Museum; it has the same measurements and general form with the Chatham Islands specimen, but the sperm cavity in front of the blow-hole is covered in by a thin callous plate. The teeth at the extremity of the lower jaw were nearly absorbed, being reduced to conical fangs, with rough surfaces, having constricted sub-cylindrical summits terminating in short acicular tips, and were so deeply imbedded in the gums that their presence was overlooked until after maceration.

Dr. Haast informs me that the length of this whale was 28 feet, and that it had no dorsal lobe. The colour was black above and white beneath, but the back and sides were marked with oval spots 2 to 3 inches across, like the skin of a leopard.

The rostrum of an individual of this species, found at Lyall Bay, near Wellington, having a less upward curve, is in the Colonial Museum.

DOLICHODON LAYARDII.

Scamperdown Whale.

D. layardii, Gray, l.c. 353. *Mesoplodon*, Flower, l.c.

Pl. III.

Teeth 2, on sides of lower jaw, strap-shaped, produced, arched, obliquely truncate at the end, with a conical process on the front of the terminal edge.

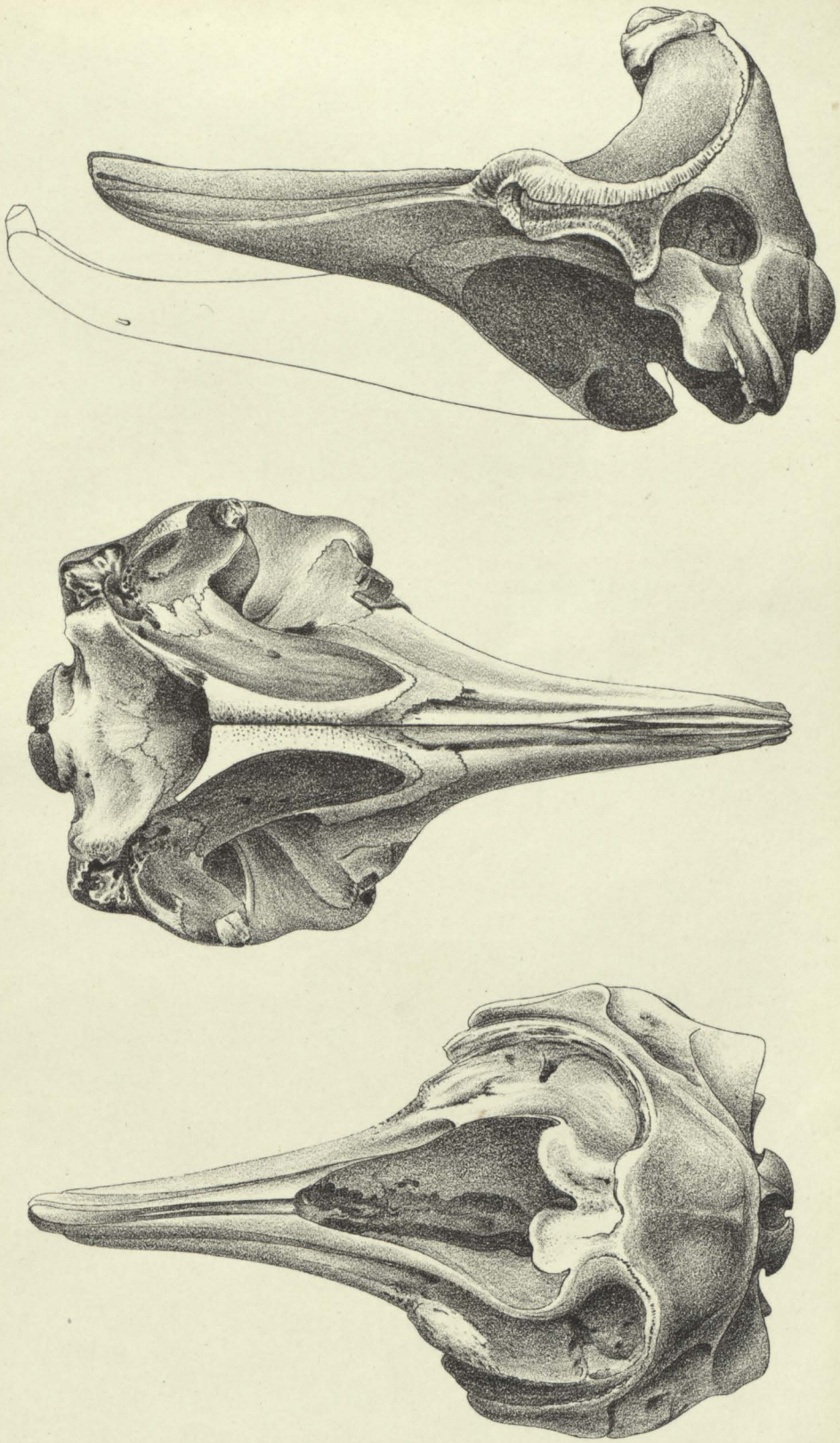
Lower jaw, Chatham Islands, obtained by Mr. H. Travers.

The total length of this jaw is 2 feet 9 inches; the posterior third is thin, convex externally, expanded, having a height of 6 inches. It is then straight, and compressed in its middle third as far as the commencement of the symphysis, which unites the *rami* for their anterior third into a straight

* The following is the manner in which the Ziphid Whales should be grouped according to the views expressed by Professor Flower in a recent paper—"Nature," Vol. V., No. 110, p. 105, Dec. 7th, 1871 :—

ZIPHID WHALES.

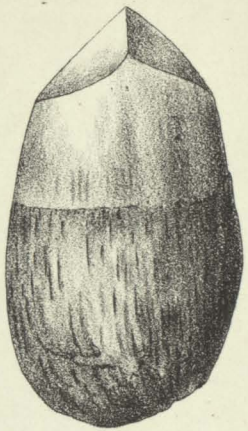
I. Genus *Hyperoodon*, Lacépède.
H. rostratus, Wesmael.
H. latifrons, Gray.
II. Genus *Ziphius*, Cuvier.
Z. cavirostris, Cuvier.
Z. indicus, Van Beneden.
Z. (Petrorhynchus) capensis, Gray.
Z. (Epiodon) australis, Bur.
Z. (Epiodon) chathamiensis.
III. Genus *Mesoplodon*, Gervais.
M. (Ziphius) sowerbiensis, Gervais.
M. (Z.) layardii, Gray.
M. densirostris, De Blainville.
M. knoxi.
IV. Genus *Berardius*, Duvernoy.
B. arnuxii, Duv.



EPIODON CHATHAMIENSES.
1/8 nat size.

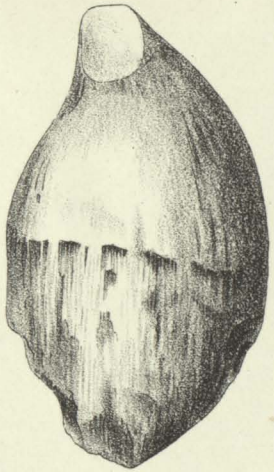
J.B. del. et lith.

2. a.



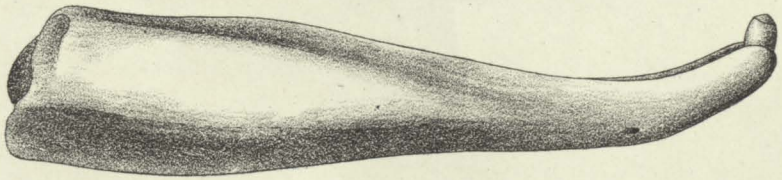
2. b.

nat. size.



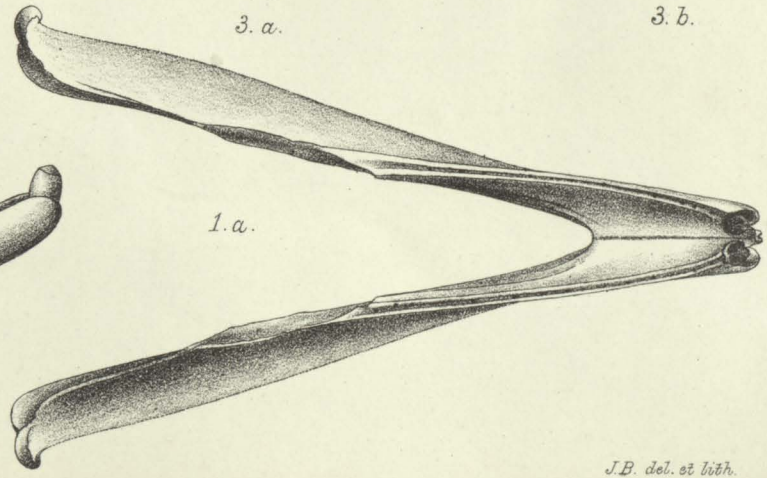
3. a.

3. b.



1. b.

1/8 nat size.



1. a.

EPIODON CHATHAMIENSIS.

J.B. del. et lith.

conical beak, channelled above and rounded below. The hinder edge of the tooth is 18 inches from the condyle, the width of the base of the tooth is 5 inches, and its anterior margin is $1\frac{1}{2}$ inches in advance of the commencement of the symphysis. The lower margin of the jaw is swollen opposite the insertion of the teeth, which are deeply inserted, and slope obliquely backwards, with a decided incurvature towards the mesial line. The teeth are 6 inches long, 3 inches wide, and $\frac{3}{4}$ inch thick. The acute point on the upper angle is very marked, and the anterior edge is worn into a deep notch, with a rough surface showing the laminated structure of the tooth. It is implanted in the jaw by seven or eight fang-like processes, as if formed by the fusion together of a number of teeth.

There is no socket or notch in the jaw posterior to the tooth, the upper edge of the jaw being sharply defined, but from the tooth forwards there is a distinct dental groove showing the remains of alveolar processes.

The species to which I refer the jaw is only known from a single specimen obtained at the Cape of Good Hope, which differs in the greater height and more marked incurvature of the teeth. As it is a larger individual, the lower jaw measuring 3 feet, this difference may be due to age or sex.

MESOPLODON KNOXI.*

Mesoplodon, Flower, l.c. *Berardius arnuxii* (Duv.), Hector, *Trans.* N.Z. Inst., II., 27. Smaller Ziphid Whale, Hector and Knox, *Trans.* N.Z. Inst., III., 125. Pl. XIII., XIV. and XV.

Ear bones; Pl. VI., 4a. and b.

Teeth $\frac{-}{2}$; body fusiform; head rounded, beaked, upper snout long and flexible; eye half way between the angles of the mouth and the pectorals, which are small; dorsal over the tail; tail-lobes large, falcate (Knox); skull globular, with a slender conical beak; intermaxillaries form thin linear callous plates, incurved, and inclosing a deep groove occupied by a ligament that extends back from the snout to the blow-holes (as in *Berardius*), where the groove is closed by the slightly expanded front edge of the septum. [In the adult this groove is obliterated, and the upper surface of the beak forms a hard callous ridge, as in *Epiodon.*] They then form a flat lunate area in front of the blow-holes, and behind rise vertically to form moderate knob-like

* Dr. Gray informed me in January last that he intended to describe this species under a different name, but not having heard from him again on the subject I adopt the name I originally suggested in compliment to Dr. F. Knox, the veteran anatomist, who has devoted much of his leisure to the study of Cetaceans during thirty years residence in this Colony.

crests, separated by a notch, the nasal bones being feebly developed; the maxillaries commence at the sides at some distance from the tip of the beak, but expand behind into a slightly concave surface that covers the whole of the frontal area; the supra-occipital is convex; blow-holes are straight, almost equally developed, and vertical; the skull being only very slightly unsymmetrical; lower jaw expanded and convex behind, produced and slender in front, united by a symphysis equal to one-third the total length of the bone, and which is slightly ascending; the teeth are deeply implanted in the top of the jaw, and were completely inclosed in the gums, so as only to be discovered by dissection; they are small, quite compressed, of oblique triangular shape, rough at the base, but with a sharp polished tip. Their weight is about forty grains each.

A. Skull (for dimensions, see *Trans.* N.Z. Inst., II., 27), cervical vertebræ, scapulæ, hyoid and pectoral bones of a specimen cast ashore in Taitai Bay near Porirua. Total length, 9 feet 3 inches. Collected by Dr. Knox. This skull was at first taken for a young *Berardius* on account of the deep groove along the beak.

Two teeth of the same shape have been obtained, the one in New Zealand, the other in the Chatham Islands, which are of much larger size, weighing over 200 grains. This circumstance, and the very spongy character of the bones, and the imperfect ossification of the sutures, lead to the belief that the above described specimen was only a young individual, and that this whale reaches a much larger size. A second skull, with part of the beak broken off, has since been found in a sandy deposit, some distance from the sea, near Wanganui. It agrees exactly in size and form with the foregoing.

B. The skull of an adult in the Canterbury Museum, picked up on the Kaiapoi beach, has the same general form. but is one-fourth larger, and is slightly different in its proportion, the beak being more slender at the notch. The groove along the upper surface of the beak is completely obliterated, and converted into a dense callous ridge, with a depressed channel on each side. The sutures of the skull have also been completely ossified, and the bone has lost the spongy texture that characterizes the two first specimens described.

The following are the measurements of the skull in the Canterbury Museum:—

	Inches.
Total length	31
Length of beak	18
Width at orbits	11
Height of occiput	10·5
Width of blow-hole	2·

Skull symmetrical. Lower jaw wanting.

BERARDIUS ARNUXII.

Porpoise Whale.

B. arnuxii (Duv.) Gray, l.c. 348, Haast, *Trans.* N.Z. Inst., II., 190. Knox and Hector, *Trans.* N.Z. Inst. III., 128, Pl. XVI. and XVII.

Ear bones; Pl. VI., 5a. and b.

Teeth $\frac{2}{2}$; dorsal fin large, extended far back with a large boss in front of it; beak of skull sub-cylindrical, slender; intermaxillaries linear, slender, rather swollen on the sides of the blowers, but not reflected to form a crest; nasal bones swollen, as in *Globiocephalus*; maxillary bones, shorter externally than the intermaxillaries, flat and expanded over the orbits; teeth triangular, sub-compressed, with base rugulose; point acute and smooth in the side of lower jaw close to tip, but not protruded through the gum; pectoral fins triangular; colour deep velvety black, lighter beneath; atlas, second, third, and fourth cervicals anchylosed; fifth and sixth free.

Skull, cervical vertebræ, hyoid, clavicle and sternebræ, of a specimen killed in Wellington harbour; prepared by Dr. Knox.

Length 27 feet.

DESCRIPTION OF PLATES.

Plate I.—*Clymenia obscura*, Gray.
Side and upper view of skull, one-fifth nat. size.
Electra clancula, Gray.
Side and upper view of skull, one-fifth nat. size.

Plate II.—*Delphinus forsteri*, Gray.
Side and upper view of skull, one-fifth nat. size.
Clymenia novæ-zealandiæ, Forster.
Side and upper view of skull, one-fifth nat. size.

Plate III.—*Dolichodon layardii*, Gray. One-eighth nat. size.
1. Lower jaw, from above. 4. Right tooth, side view.
2. „ „ side view. 5. „ „ from above.
3. „ „ front view.
Electra clancula, Gray.
Delphinus forsteri, Gray.
(Reduced from Pl. XXIV., "Voy. of Ereb. and Terr.")

Plate IV.—*Epiodon chathamiensis.*
Side, lower, and upper views, one-eighth nat. size.

Plate V.—*Epiodon chathamiensis.*
1a. Side view of lower jaw. 1b. Upper view of lower jaw.
One-eighth nat. size.

Plate V.— *Epiodon chathamiensis.*—continued.

2a. and b. Tooth of the specimen collected by H. Travers.

3a. and b. Tooth collected by Dr. Buller (nat. size.)

Plate VI.—Tympanic Bones. Half nat. size.

1a. and b. *Neobalœna marginata*, Gray.

2. *Eubalœna australis*, Gray.

3a. and b. *Megaptera novæ-zealandiæ*, Gray.

4a. and b. *Mesoplodon knoxi.*

5a. and b. *Berardius arnuxii*, Gray.

[NOTE.—7th February, 1873—A communication just received from Dr. Gray since the previous pages were pressed enables me to add the following:—

Macleyius australiensis.

M. australiensis, Gray, "Cat. Seals and Whales," 105.

This is a new whalebone whale to New Zealand, the species having been founded on a few bones in the Australian Museum at Sydney. It has now been added to our fauna through a skeleton having been sent to the British Museum by Dr. Haast.

The minute description of the cervical vertebræ of the British Museum skeleton, given by Dr. Gray, leaves no doubt that it is the common Black Whale of New Zealand, which I have referred to above as *Eubalœna australis.*

Berardius hectori.

B. hectori, Gray, "Ann. and Mag. N.H.," 1871, VIII., 117.

This is *Mesoplodon knoxi* of the foregoing list. Dr. Gray mentions the skull of an allied form in the Sydney Museum as being *Mesoplodon longirostris*, Krefft. I have already mentioned that the first described skull in the Colonial Museum with the deep groove between the thin linear intermaxillaries, occupied by a ligament, is probably only the young condition of the skull in the Canterbury Museum which has a solid beak, and it is not improbable that the young animal may possess a prehensile upper lip to assist it in sucking, and that in the adult state this condition disappears, and the snout acquires the acute form.—J. H.]

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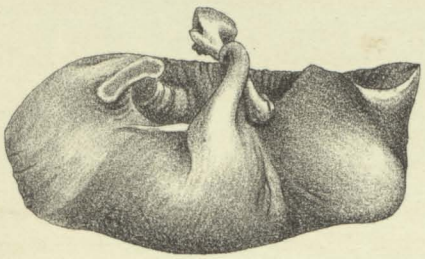

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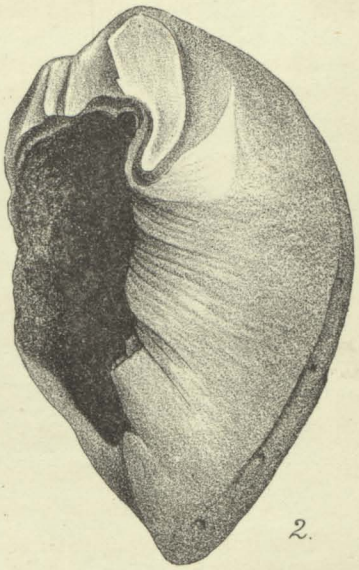

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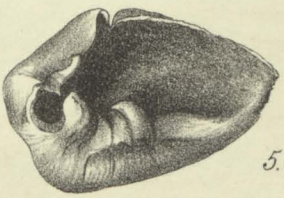

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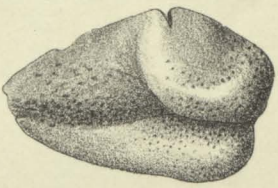

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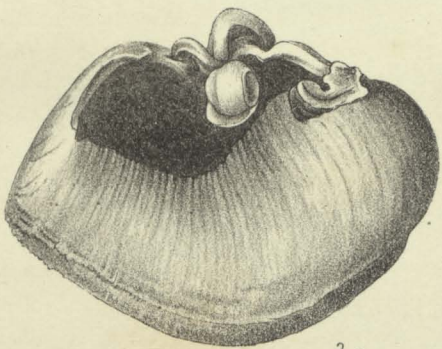
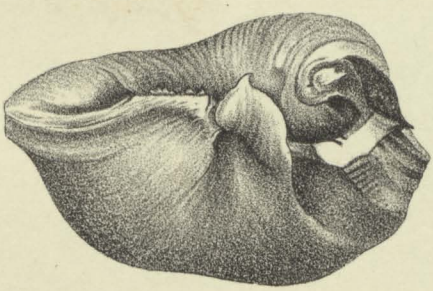


3. a.

4. a.



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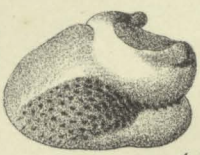

4. b.

J.B. del. et lith.