

## II.—ZOOLOGY.

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ART. XVIII.—*Notes on Balænoptera rostrata, Fabricius, (B. huttoni, Gray).*

By Professor JULIUS VON HAAST, Ph.D., F.R.S., Director of the Canterbury Museum.

[Read before the Philosophical Institute of Canterbury, 30th December, 1880.]

### Plate III.

ON the 7th February of this year the information reached me that in the early morning a whale had been stranded on the Sumner beach, and that it had been taken possession of by Mr. Joseph Day, of that place. Proceeding without delay to that locality, I found the animal in question to be a male specimen of the small pike whale (*Balænoptera huttoni*, Gray) twenty-three feet four inches long, and of which a skeleton is in the British Museum. The animal had died only a short time before, and was consequently quite fresh; and, as the greatest care had been taken to preserve it from injury, a welcome opportunity was offered to me to make a careful description on the spot, and to take the necessary measurements. The whale was almost lying on its back, so that the extensile bag formed by the plaits at the throat and upper portion of the breast had fallen in, the animal thus appearing remarkably flat-headed—in fact, the head reminded one, when the large mouth was shut, of that of a huge reptile. The plaits counted across amounted to sixty-four.

Those in and towards the centre began only at a distance of about one foot from the top of the lower jaw, while the others reached close to its sides, ending in the same manner on the lower chest. The side plaits were continuous, thus differing from those of the centre, which were interrupted two or three times, with short intervals between them.

*Colour.*—Back, dorsal fin, and sides, slaty-black; breast, throat, and belly, white. The black colour advances considerably near the shoulder upon the throat, then retreats again, and the white colour advances up the side so as to surround the base of the pectoral fin, of which the lower portion is also of a clear blueish-white tinge, the effect of which is still more heightened by the black terminating on it in beautiful fringe-like patterns in distinct designs, and ranging between bright and dark slaty-black.

Immediately above the caudal fin the white disappears, and the lower surface assumes a dark greyish colour.

The centre of the caudal fin is, however, white, both sides and the posterior edge being slaty-black, and the same remarkable patterns, having sometimes the form of a wave toppling over, form the boundary between both colours.

The contrast between the black and the milky-white, and the cloud-like appearance of some of the marks in bright violet upon the latter is very striking.

*Tongue*, bright violet; lower portion of mouth, violet. Palate, near tip of snout slaty-black, gradually getting lighter and changing to violet.

*Form*.—Our New Zealand specimen agrees so closely with the description of the form of *Balænoptera rostrata* from the northern hemisphere, that I have no doubt, after comparing also the skeletons, that our small New Zealand pike whale is identical with the northern species, and that therefore the generic distinction as given by Gray has to be abandoned. I shall therefore not transcribe my notes as to its general appearance, nor add a drawing of the Sumner specimen, as this has been done by others, including Prof. F. W. Hutton, who has published a drawing of a small specimen (of the length of 16 feet 2½ inches, taken in October, 1873, off Otago Heads) in the Annals and Magazine of Natural History.\*

I was informed that the specimen under consideration showed marks of having been wounded all over and probably driven ashore by a swordfish, but on examination I did not find that any of the small fresh wounds upon it could have been inflicted by such an animal.

All the wounds of fresh appearance were roundish, and only about half an inch in diameter and of no depth, being all near the lower portion.

However, there were a considerable number of scars on different parts of the body, some of them three inches long and two inches broad, having also a continuous line of a more pronounced scar along the centre, which might be attributed to a *Histiophorus*.

#### MEASUREMENTS.

	Ft.	in.
Total length in a straight line .. .. .	23	4
Length of gape .. .. .	4	10
From tip of snout to anterior corner of eye .. .. .	4	1
Eye, longitudinal diameter .. .. .	0	2½
„ vertical .. .. .	0	1
From tip of snout to base of pectoral fin .. .. .	7	8

\* "Ann. and Mag. Nat. Hist.," ser. 4, vol. XIII., pl. xvi.

	Ft.	in.
Length of pectoral fin measured along lower edge .. ..	2	7
Greatest breadth of pectoral fin .. .. .	0	11½
From centre of caudal flipper to posterior margin of dorsal fin	6	0
Length of dorsal fin at base .. .. .	1	8
Height .. .. .	1	11
Breadth .. .. .	0	6
From centre of caudal flipper to posterior end of vent ..	5	11½
Length of vent .. .. .	0	6
Interspace between vent and orifice of the prepuccium ..	0	7
Length of orifice of prepuccium .. .. .	1	4
Length of two testal folds. (The two testal folds lie about 11 in. from the lower end of the former.)	0	5½
From centre of caudal flipper to beginning of plaits ..	11	3
From tip of snout to the blowholes .. .. .	2	11
Length of blowholes .. .. .	0	7
Length of depression or furrow between blowholes ..	0	9
Distance of blowholes from each other at anterior end ..	0	1
"                    "                    posterior end ..	0	4½
Greatest circumference 13 feet from notch of caudal flipper*	10	10

*Skeleton*.—Although further on I shall give a few particulars of the skeleton under review, in order to contribute towards the better knowledge of this interesting species, I have to observe that when comparing it with the figure of *Balænoptera rostrata* in the "Ostéographie des Cétacés," plates XII. and XIII., I could not find the least difference in its general characteristic features. This became still more striking when I compared the measurements of the parts of our skeleton with those given in the publication of the Ray Society at page 273, of a young female with loose vertebral epiphyses.

As the Sumner skeleton, in which the vertebral epiphyses are also still unanchylosed, is only two inches smaller, I have thought it more convenient and instructive to give, in the following table, the measurements of the principal parts, to show how very closely they agree with each other.

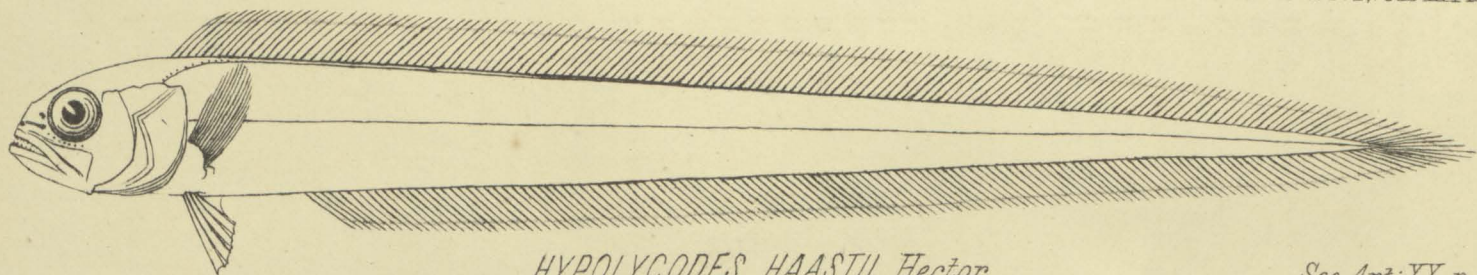
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\* This measurement is only approximate, as owing to the heavy weight it was impossible to pass the tape quite round, so that only one half of the circumference of the body has been measured as correctly as possible.

Professor Hutton gives the greatest circumference of the Otago specimen as ten feet. In comparing the two drawings the Sumner specimen appears to be far more slender than the former. In some respects age, and most probably the beginning of decomposition of the Otago specimen, may have something to do with its having a more robust appearance.

COMPARATIVE MEASUREMENTS of the skeletons and their parts of *Balanoptera rostrata*, Fabricius, from Bergen (Norway) and Sumner (New Zealand):—

	Bergen skeleton.	Sumner skeleton.
	ft. in.	ft. in.
Length of skeleton in a straight line .. .. .	23 0	22 10
„ skull „ „ .. .. .	5 2½	5 2½
Width of skull across temporal bones.. .. .	2 11⅞	2 8½
„ beak at the base .. .. .	1 9	1 9½
„ „ „ middle .. .. .	1 1½	1 2
Length of „ „ „ .. .. .	3 4½	3 4½
„ one lower jawbone along the curve on the outer side ..	5 5⅞	5 4¾
Circumference of lower jawbone at the middle .. .. .	1 0	0 11½
Length of corpus at atlas .. .. .	0 2	0 2
Width of atlas across processus transversi .. .. .	1 0	0 11½
Length of lateral processes of axis .. .. .	0 6	0 6
„ corpus of third cervical vertebra .. .. .	0 1½	0 1
„ „ seventh „ „ .. .. .	0 1½	0 1⅞
„ „ first dorsal „ „ .. .. .	0 1¾	0 1¾
Width of „ „ „ .. .. .	0 5⅞	0 5⅞
Length of „ eleventh dorsal „ .. .. .	0 5	0 4¾
„ „ first lumbosacral vertebra .. .. .	0 5	0 4⅞
„ lateral processus, first „ „ .. .. .	0 9½	0 9½
„ corpus of seventh „ „ .. .. .	0 5⅞	0 6
„ „ spinosus of first caudal vertebra .. .. .	0 7½	0 7
„ „ sixth caudal vertebra .. .. .	0 6⅞	0 6⅞
„ „ thirteenth caudal vertebra .. .. .	0 1¾	0 1¾
„ first ribs along the curve on outer edge .. .. .	2 2⅞	2 2
Width of „ at lower end .. .. .	0 4½	0 4½
Length of fourth ribs along the curve on outer side .. .. .	4 0	4 0½
Width of „ at lower end .. .. .	0 2	0 1⅞
Length of eleventh ribs along the curve on outer side .. .. .	2 8	2 7⅞
„ shoulder blade .. .. .	1 2	1 2
Width of „ .. .. .	1 11½	1 11
Length of acromion .. .. .	0 5½	0 5¾
„ processus coracoideus .. .. .	0 3½	0 3½
„ os humeri .. .. .	0 10	0 9¾
„ radius in a straight line .. .. .	1 5	1 5
„ ulna in a straight line without olecranon .. .. .	1 3½	1 3½
„ ossa pelvis .. .. .	0 6	0 7
„ the longest baleen .. .. .	0 8½	0 9½
„ sternum .. .. .	1 2½	1 0¾
Width of „ .. .. .	0 9½	0 9¾

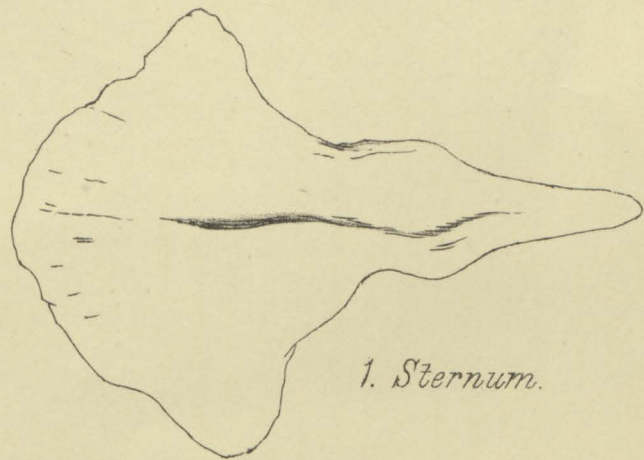


*HYPOLYCODES HAASTII*, Hector.

See Art. XX, p. 194.



2. Plate of baleen.



1. Sternum.

*BALÆNOPTERA ROSTRATA* Fabricius. (*B. Huttoni*, Gray.)

See Art. XVIII.



The sternum of the Sumner skeleton is somewhat different from the one figured in the "Ostéographie des Cétacés," and I therefore add a figure of the former (Plate III.) from which, it will be observed that that bone is more rounded in its anterior portion, more keeled, but that it resembles in its posterior portion that of *B. robusta*, as figured on page 283 of Lilljeborg's Memoir on the Scandinavian Cetacea in Recent Memoirs on the Cetacea, published by the Ray Society. From the latter it is, however, distinguished in being rounded in its anterior portion.

It has therefore not altogether the form of a Latin cross, according to Van Beneden and Gervais, as observed in other skeletons examined by them. However, as all the other bones show no difference from those of the northern skeletons, we can safely assume that the form of the sternum is not of specific value, and that other skeletons of *B. rostrata* will be obtained in which the sternum will resemble the one under consideration.

Of those portions of the skeleton showing any peculiarity, the cervical vertebræ have to be mentioned, although in the northern skeletons a similar asymmetry has also been observed.

#### *Cervical Vertebræ.*

All the seven cervical vertebræ are free. However, as the terminal epiphyses of the body of the vertebræ throughout are still separate, thus proving the animal to be of immature age, we cannot claim this as a specific character for the southern species, as Dr. Gray has done.

In fact, according to Dr. Hector, the second and the third cervicals in Gray's type specimen in the British Museum show marks of adhesion, and specimens of these vertebræ in the Colonial Museum are as firmly ankylosed as in *B. rostrata*.\*

Of these cervical vertebræ the axis and the sixth have the two lateral processes on both sides formed into a ring, the extremity of the former being square, and of the latter pointed. The upper transverse process on the left side of the fifth cervical vertebra is as long as that of the sixth, but is not united to the lower process, the latter not reaching within one and three-quarter inches of the extremity of the upper one. On the right side of this fifth cervical they are united and form a ring, the anterior end being thin and more square than that of the sixth. On the seventh the upper transverse process, which is also directed forward and compressed from before backwards, is large, while the lower appears as a small protuberance.

#### *Dorsal Vertebræ.*

There are ten dorsal vertebræ.

A similar protuberance (for the parapophysis) exists also in the first dorsal vertebra, of which the diapophysis is still compressed from before

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\* Hector in "Trans. N.Z. Inst." Vol. X., p. 337.

backwards, but much stouter than that of the preceding seventh cervical. The same process, although short and stout, takes a horizontal position in the second dorsal, getting gradually, as we advance, longer and flatter.

The facets for the attachment of the ten ribs are situated on the posterior side of the diapophyses. These latter processes in the first six dorsals are directed still forward, gradually assuming a straighter position, which is first obtained in the seventh.

*Lumbar vertebrae* 12

*Caudal* „ 18

Their form and dimensions agree so fully with the description of *B. rostrata*, that I need not repeat it here.

There are consequently 48 vertebrae in all.

*Chevron bones.*

There are ten chevron bones, of which the second is the largest.

They resemble very much in their form those of the skeleton of *B. rostrata* in the "Ostéographie des Cétacés" by Van Beneden and Gervais, plates XII. and XIII., where, however, only eight are figured, although they state that there are nine.

The two last chevron bones of the New Zealand skeleton have the two lateral disc-like parts of which they consist, not united in the mesial line.

They are small, especially the last one between the 10th and 11th caudal, which is only  $\frac{1}{2}$  inch long and  $\frac{1}{4}$  inch high.

It was fixed to the cartilage, and did not touch the lower edge of either vertebra.

*Baleen.*

Owing to the care of Mr. Joseph Day, who has presented this skeleton to the Museum, the baleen remained uninjured, and I was thus able to place it again into its proper position in the skull.

There are 220 plates on each side, of which six to eight form the fringe in front of the nose, uniting both sides.

As I had one of the sides (the right one) photographed, I am thus enabled to offer a faithful representation of this characteristic portion of the skull (Plate III.).

The baleen is white.

The first 150 plates, counting from the posterior end, have generally a black edge gradually shading off towards the middle of the blade on the outer side from the base half-way upwards.

Beginning with a length of about 2 inches at the gape they rapidly increase in size, till, at the 56th from the posterior end, they are  $9\frac{1}{2}$  inches long, with a breadth of 3 inches.



After retaining this length for some distance they gradually get shorter, till near the top of the nose they have dwindled to a length of  $1\frac{1}{2}$  inches. On the inner side of this principal set of baleen, and close to the palate, a smaller fringe is observable, of which the baleen, where longest, reaches the length of  $1\frac{1}{2}$  inch, by a breadth of 1 inch.

This inner fringe is separated by a well-defined line of division from the larger baleen, and shows, at the same time, three or more lines of division, so that the base has quite a reticulated appearance.

That the larger and smaller series are quite distinct from each other is well exhibited on the base, because, although in some parts the line of the large baleen is continued into the inner fringe, in others this is not the case, the inner baleen beginning on the line of division between the baleen plates of the larger series.

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ART. XIX.—Notes on some Specimens of migratory Salmonidæ.

By W. ARTHUR, C.E.

[Read before the Otago Institute, 24th August, 1880.]

Plates IV. and V.

BEFORE referring specially to the individual specimens I have been able to secure, I may perhaps be permitted to remind you that the study of the Salmonidæ is that of the most difficult and perplexing branch of ichthyology. This is due to the following circumstances:—the close relation between some of the species; the numerous varieties of the same species; the confusion arising from the same fish being differently named in different localities, or erroneously named; and lastly, the want of completeness and precision of description in the writings of many who have undertaken to describe fish.

*General remarks on well known species.*

To illustrate in a general way the many varieties which occur of the same species, I would direct your attention to the species *S. salar*, *S. trutta*, and *S. fario*, of the British genus *Salmo*.

I have seen individuals of the species *S. salar*—the true salmon—from the Tay, the Tweed, Solway, Clyde and tributaries, Awe, Orchy, Lochy, Ness, Dee (Aberdeenshire); from several English rivers, as the Tyne, Dee, etc., and from the west of Ireland. These were all specifically the same fish, yet possessing individual characteristics sufficient to indicate and distinguish the fish of one river from those of any of the others. For